

Appendix A

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APPENDIX A

PUBLIC INVOLVEMENT

I. AVAILABILITY OF THE DRAFT EA

The Draft EA is available for public review and comment at the KCAB Administration Building from November 16, 2016 through December 16, 2016. The KCAB has provided an opportunity for a public hearing as outlined in FAA Order 5050.4B, Section 404. NOTICE OF OPPORTUNITY FOR A PUBLIC HEARING. The notice, containing all required information, was published in The Cincinnati Enquirer on November 16, 2016. A copy of the Draft EA was also made available to regulatory agencies. Copies of newspaper notices and distribution letters will be included in this appendix. If any comments are received or a request for a public hearing is made, that information will also be included in this appendix.

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Appendix B

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APPENDIX B

AIR QUALITY

I. INTRODUCTION

The Proposed Project at the Cincinnati/Northern Kentucky International Airport (CVG or Airport) includes the following:

- Site preparation, including tree clearing, of Site 6BE, 6BW, and 6CW which measure approximately 60 acres in size and are located on the east and west sides of Ted Bushelman Boulevard;
- Construction of one building approximately 200,000-275,000 square feet with associated parking, loading docks, and circulation on Site 6BE;
- Construction and operation of one commercial building approximately 98,000 square feet with two retail spaces and associated parking and circulation areas on Site 6BW;
- Construction of a commercial store front on corner of Site 6CW and storage buildings along the narrow area with associated parking and circulation areas;
- Grading activities of land to facilitate stormwater flow; and
- Construction of detention basins.

The Proposed Project would not increase aircraft operations, change the aircraft fleet mix, or change runway use. Therefore, the potential impacts to air quality associated with the Proposed Project include an increase in surface traffic and temporary emissions from the use of construction equipment.

II. BOONE COUNTY AIR QUALITY STATUS

The airport is located within Boone County, Kentucky, which is included in the Metropolitan Cincinnati Interstate Air Quality Region.¹ The U.S. Environmental Protection Agency (USEPA) has determined that levels of the eight-hour concentration of ozone exceed the Federal standards defining healthful air quality within this area. In the past, Boone County was designated as nonattainment for 24-hour concentrations of fine particulate matter (PM_{2.5}); however, on December 15, 2011, the USEPA determined the area had attained the PM_{2.5} standard and the region was redesignated to attainment for PM_{2.5}. The area now operates under a maintenance plan for PM_{2.5}.

The use of construction equipment and vehicles for the Proposed Project will cause emissions of nitrogen oxides (NO_x) and volatile organic compounds (VOC), the precursors to ozone development; and will also emit fine particulate matter (PM_{2.5}). As such, the Proposed Project at CVG would be subject to the General Conformity provisions under the Clean Air Act (CAA, including the 1990 Amendments), which are required to ensure compliance with the Kentucky State Implementation Plan

¹ USEPA, 40 CFR Part 81.20.

(SIP).² In addition to the CAA, the impacts of the Proposed Project would require assessment under the provisions of the National Environmental Policy Act (NEPA) to determine compliance to the Federal air quality standards, referred to as the National Ambient Air Quality Standards (NAAQS). The analyses required under the CAA and NEPA are separate and distinct. However, the analyses may be combined where overlaps exist, and the results may be reported in a common document.

III. REGULATORY SETTING

NATIONAL AMBIENT AIR QUALITY STANDARDS

The Clean Air Act, including the 1990 Amendments, (CAA) provides for the establishment of standards and programs to evaluate, achieve, and maintain acceptable air quality in the U.S. Under the CAA, the USEPA established a set of standards, or criteria, for six pollutants determined to be potentially harmful to human health and welfare.³ The USEPA considers the presence of the following six criteria pollutants to be indicators of air quality:

- Ozone (O₃);
- Carbon monoxide (CO);
- Nitrogen dioxide (NO₂);
- Particulate matter (PM₁₀ and PM_{2.5});⁴
- Sulfur dioxide (SO₂); and,
- Lead (Pb).⁵

The National Ambient Air Quality Standards for the criteria pollutants, known as the NAAQS, are summarized in **Table B-1**. For each of the criteria pollutants, the USEPA established primary standards intended to protect public health, and secondary standards for the protection of other aspects of public welfare, such as preventing materials damage, preventing crop and vegetation damage, and assuring good visibility. Areas of the country where air pollution levels consistently exceed these standards may be designated nonattainment by the USEPA.

A nonattainment area is a homogeneous geographical area⁶ (usually referred to as an air quality control region) that is in violation of one or more NAAQS and has been designated as nonattainment by the USEPA as provided for under the CAA.

² The State Implementation Plan (SIP) is the State air agency document that sets forth the strategy intended to reduce air emissions in an area of poor air quality and maintain the quality of the air relevant to the Federal air quality standards.

³ USEPA, Code of Federal Regulations, Title 40, Part 50 (40 CFR Part 50) *National Primary and Secondary Ambient Air Quality Standards (NAAQS)*, July 2011.

⁴ PM₁₀ and PM_{2.5} are airborne inhalable particles that are less than ten micrometers (coarse particles) and less than 2.5 micrometers (fine particles) in diameter, respectively.

⁵ Airborne lead in urban areas is primarily emitted by vehicles using leaded fuels. The chief source of lead emissions at airports would be the combustion of leaded aviation gasoline in small piston-engine general aviation aircraft.

⁶ A homogeneous geographical area, with regard to air quality, is an area, not necessarily bounded by state lines, where the air quality characteristics have been shown to be similar over the whole area. This may include several counties, encompassing more than one state, or may be a very small area within a single county.

Some regulatory provisions, for instance the CAA conformity regulations, apply only to areas designated as nonattainment or maintenance.

A maintenance area describes the air quality designation of an area previously designated nonattainment by the USEPA and subsequently redesignated attainment after emissions are reduced. Such an area remains designated as maintenance for a period up to 20 years at which time the state can apply for redesignation to attainment, provided that the NAAQS were sufficiently maintained throughout the maintenance period.

**Table B-1
NATIONAL AMBIENT AIR QUALITY STANDARDS**

Pollutant		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide ⁽¹⁾		primary	8-hour	9 ppm	Not to be exceeded more than once per year
			1-hour	35 ppm	
Lead ⁽²⁾		primary and secondary	Rolling 3 month average	0.15 µg/m ³ ⁽³⁾	Not to be exceeded
Nitrogen Dioxide ⁽⁴⁾		primary	1-hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		primary and secondary	Annual	53 ppb ⁽⁵⁾	Annual Mean
Ozone ⁽⁶⁾		primary and secondary	8-hour	0.075 ppm ⁽⁷⁾	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years
Particulate Matter	PM2.5	primary	Annual	12 µg/m ³	annual mean, averaged over 3 years
		secondary	Annual	15 µg/m ³	annual mean, averaged over 3 years
		primary and secondary	24-hour	35 µg/m ³	98th percentile, averaged over 3 years
	PM10	primary and secondary	24-hour	150 µg/m ³	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide ⁽⁸⁾		primary	1-hour	75 ppb ⁽⁹⁾	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

Note: ppm is parts per million; ppb is parts per billion, and µg/m³ is micrograms per cubic meter.

Sources: USEPA, 40 CFR Part 50.4 through Part 50.13 and <http://www3.epa.gov/ttn/naaqs/criteria.html>.

(1) 76 FR 54294, Aug 31, 2011

(2) 73 FR 66964, Nov 12, 2008

(3) Final rule signed October 15, 2008. The 1978 lead standard (1.5 µg/m³ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

(4) 75 FR 6474, Feb 9, 2010 and 61 FR 52852, Oct 8, 1996

(5) The official level of the annual NO₂ standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard.

(6) 73 FR 16436, Mar 27, 2008

(7) Final rule signed March 12, 2008. The 1997 ozone standard (0.08 ppm, annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years) and related implementation rules remain in place. In 1997, EPA revoked the 1-hour ozone standard (0.12 ppm, not to be exceeded more than once per year) in all areas, although some areas have continued obligations under that standard (“anti-backsliding”). The 1-hour ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is less than or equal to 1.

(8) 75 FR 35520, Jun 22, 2010 and 38 FR 25678, Sept 14, 1973.

(9) Final rule signed June 2, 2010. The 1971 annual and 24-hour SO₂ standards were revoked in that same rulemaking. However, these standards remain in effect until one year after an area is designated for the 2010 standard, except in areas designated nonattainment for the 1971 standards, where the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standard are approved.

GENERAL CONFORMITY

The General Conformity Rule under the CAA establishes minimum values, referred to as the *de minimis* thresholds, for the criteria and precursor pollutants⁷ for the purpose of:

- Identifying Federal actions with project-related emissions that are clearly negligible (*de minimis*);
- Avoiding unreasonable administrative burdens on the sponsoring agency, and;
- Focusing efforts on key actions that would have potential for significant air quality impacts.

The *de minimis* rates vary depending on the severity of the nonattainment area and further depend on whether the general Federal action is located inside an ozone transport region.⁸ An evaluation relative to the General Conformity Rule (the Rule), published under 40 CFR Part 93,⁹ is required only for general Federal actions that would cause emissions of the criteria or precursor pollutants, and are:

- Federally-funded or Federally-approved;
- Not a highway or transit project¹⁰;
- Not identified as an exempt project¹¹ under the CAA;
- Not a project identified on the approving Federal agency's Presumed to Conform list;¹² and,
- Located within a nonattainment or maintenance area.

The Proposed Project at CVG is included in a nonattainment area for ozone and maintenance area for CO. Further, the Proposed Project meets the remaining criteria for requiring an evaluation under the General Conformity Rule.

⁷ Precursor pollutants are pollutants that are involved in the chemical reactions that form the resultant pollutant. Ozone precursor pollutants are NO_x and VOC, whereas PM_{2.5} precursor pollutants include NO_x, VOC, SO_x, and ammonia (NH₃).

⁸ The ozone transport region is a single transport region for ozone (within the meaning of Section 176A(a) of the CAA), comprised of the States of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and the Consolidated Metropolitan Statistical Area that includes the District of Columbia, as given at Section 184 of the CAA.

⁹ USEPA, 40 CFR Part 93, Subpart B, *Determining Conformity of General Federal Actions to State or Federal Implementation Plans*, July 1, 2006.

¹⁰ Highway and transit projects are defined under Title 23 U.S. Code and the Federal Transit Act.

¹¹ The Proposed Project is not listed as an action exempt from a conformity determination pursuant to 40 CFR Part 93.153(c). An exempt project is one that the USEPA has determined would clearly have no impact on air quality at the facility, and any net increase in emissions would be so small as to be considered negligible.

¹² The provisions of the CAA allow a Federal agency to submit a list of actions demonstrated to have low emissions that would have no potential to cause an exceedence of the NAAQS and are presumed to conform to the CAA conformity regulations. This list would be referred to as the "Presumed to Conform" list. The FAA Presumed to Conform list was published in the Federal Register on February 12, 2007 (72 FR 6641-6656) and includes airport projects that would not require evaluation under the General Conformity regulations.

When the action requires evaluation under the General Conformity regulations, the net total direct and indirect emissions due to the Federal action may not equal or exceed the relevant *de minimis* thresholds unless:

- An analytical demonstration is provided that shows the emissions would not exceed the NAAQS; or
- Net emissions are accounted for in the SIP planning emissions budget; or
- Net emissions are otherwise accounted for by applying a solution prescribed under 40 CFR Part 93.158.

The Federal *de minimis* thresholds established under the CAA are given in **Table B-2**. Conformity to the *de minimis* thresholds is relevant only with regard to those pollutants and the precursor pollutants for which the area is nonattainment or maintenance. Notably, there are no *de minimis* thresholds to which a Federal agency would compare ozone emissions. This is because ozone is not directly emitted from a source. Rather, ozone is formed through photochemical reactions involving emissions of the precursor pollutants NO_x and volatile organic compounds (VOC) in the presence of abundant sunlight, and heat. Therefore, emissions of ozone on a project level are evaluated based on the rate of emissions of the ozone precursor pollutants, NO_x and VOC.

Table B-2
DE MINIMIS THRESHOLDS

CRITERIA AND PRECURSOR POLLUTANTS	TYPE AND SEVERITY OF NONATTAINMENT AREA	TONS PER YEAR THRESHOLD
Ozone (VOC or NO _x) ¹	Serious nonattainment	50
	Severe nonattainment	25
	Extreme nonattainment	10
	Other areas outside an ozone transport region	100
Ozone (NO _x) ¹	Marginal and moderate nonattainment inside an ozone transport regions ²	100
	Maintenance	100
Ozone (VOC) ¹	Marginal and moderate nonattainment inside an ozone transport region ²	50
	Maintenance within an ozone transport region ²	50
	Maintenance outside an ozone transport region ²	100
Carbon monoxide (CO)	All nonattainment & maintenance	100
Sulfur dioxide (SO ₂)	All nonattainment & maintenance	100
Nitrogen dioxide (NO ₂)	All nonattainment & maintenance	100
Coarse particulate matter (PM ₁₀)	Serious nonattainment	70
	Moderate nonattainment and maintenance	100
Fine particulate matter (PM _{2.5}) (VOC, NO _x , NH ₃ , and SO _x) ³	All nonattainment and maintenance	100
Lead (Pb)	All nonattainment and maintenance	25

¹ The rate of increase of ozone emissions is not evaluated for a project-level environmental review because the formation of ozone occurs on a regional level and is the result of the photochemical reaction of NO_x and VOC in the presence of abundant sunlight and heat. Therefore, USEPA considers the increasing rates of NO_x and VOC emissions to reflect the likelihood of ozone formation on a project level.

- ² An OTR is a single transport region for ozone, comprised of the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and the Consolidated Metropolitan Statistical Area that includes the District of Columbia.
- ³ For the purposes of General Conformity applicability, VOC's and NH₃ emissions are only considered PM_{2.5} precursors in nonattainment areas where either a State or USEPA has made a finding that the pollutants significantly contribute to the PM_{2.5} problem in the area. In addition, NO_x emissions are always considered a PM_{2.5} precursor unless the State and USEPA make a finding that NO_x emissions from sources in the State do not significantly contribute to PM_{2.5} in the area. Refer to 74 FR 17003, April 5, 2006.

Notes: Federal thresholds that are shaded are applicable to this project.
Code of Federal Regulations (CFR), Title 40, *Protection of the Environment*.
USEPA defines *de minimis* as emissions that are so low as to be considered insignificant and negligible. Volatile organic compounds (VOC); Nitrogen oxides (NO_x); Ammonia (NH₃); Sulfur oxides (SO_x).

Sources: USEPA, 40 CFR Part 93.153(b)(1) & (2).

Similar to ozone, the net emissions of PM_{2.5} and the precursor pollutants SO_x, NO_x, and VOC would be evaluated and compared against the minimum threshold of 100 tons per year each for the CVG Proposed Project. If the General Conformity evaluation for this air quality assessment were to show that any of these thresholds were equaled or exceeded due to the Proposed Project, further, more detailed analysis to demonstrate conformity would be required, which is referred to as a General Conformity Determination. Conversely, if the General Conformity evaluation were to show that none of the relevant thresholds were equaled or exceeded, the Proposed Project at CVG would be presumed to conform to the Kentucky SIP and no further analysis would be required under the CAA.

TRANSPORTATION CONFORMITY RULE APPLICABILITY

Although airport improvement projects are usually considered under the General Conformity regulations, there can be elements of a Federal action or its alternatives that may require an analysis to demonstrate Transportation Conformity, such as actions relating to transportation plans, programs, projects developed, funded, or approved under Title 23 United States Code (U.S.C.) or the Federal Transit Act (FTA),¹³ or involve Federal highways. In such cases, the sponsoring Federal agency would be required to coordinate with the Federal Highway Administration (FHWA), the state Department of Transportation (DOT), and the local metropolitan planning organization (MPO) to assist in completing a Transportation Conformity evaluation.

As with General Conformity, Transportation Conformity regulations apply only to Federal actions located within a nonattainment or maintenance area. The Proposed Project under consideration at CVG would not be developed, funded, or approved by the FHWA or FTA. Therefore, the Transportation Conformity regulations would not apply.

¹³ USEPA, 40 CFR Part 93.153, *Applicability*, July 1, 2006

INDIRECT SOURCE REVIEW

Some states require an air quality review when a Federal action has the potential to cause an increase in net emissions from indirect sources. Indirect sources cause emissions that occur later in time or are farther removed from the Federal action. Depending on the state, indirect sources may be identified as motor vehicles on highways, parking at sports and entertainment facilities, or an increase in aircraft operations. The state requirement may be referred to as the indirect source review (ISR) and each state requiring an ISR sets thresholds for increased operation of the indirect sources. When a Federal action has the potential to exceed these thresholds, an air quality review is required to assess the character and impact of the additional emissions and determine whether a permit is required, which is separate from the analyses required under NEPA or the CAA. According to FAA, *Air Quality Procedures for Airports and Air Force Bases*,¹⁴ Kentucky does not require an ISR.

IV. EMISSIONS INVENTORY

The impacts to air quality due to the Proposed Project were determined in accordance with the guidelines provided in FAA, *Aviation Emissions and Air Quality Handbook Version 3*,¹⁵ and FAA Order 5050.4B¹⁶, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*, which together with the guidelines of FAA Order 1050.1F,¹⁷ *Environmental Impacts: Policies and Procedures*, constitute compliance with all the relevant provisions of NEPA and the CAA.

A construction emissions inventory was calculated for the Proposed Project using U.S. EPA NONROAD and MOVES emission factors to calculate emissions for construction equipment. The emissions estimated to occur during construction of the Proposed Project at CVG is given in **Table B-3**.

Construction Emissions

Short-term temporary air quality impacts would be caused by construction of the Proposed Project. In accordance with FAA Order 1050.1F, the impacts to the environment due to construction activities must be assessed. A construction emissions inventory was calculated for the Proposed Project using the Airport Construction Emissions Inventory Tool which incorporates U.S. EPA NONROAD and MOVES emission factors to calculate emissions for construction equipment. Construction of the Proposed Project is expected to occur over a 10-month period in 2017 dependent upon environmental approval.

¹⁴ FAA, *Air Quality Procedures for Civilian Airports & Air Force Bases*, Appendix J, April 1997 and Addendum September 2004.

¹⁵ FAA, *Aviation Emissions and Air Quality Handbook Version 3*, July 2014.

¹⁶ FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*, April 28, 2006.

¹⁷ FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, July 16, 2015.

Operational Emissions

A construction emissions inventory was also calculated for the Proposed Action using USEPA NONROAD and MOVES emission factors to calculate emissions for construction equipment. The emissions estimated to occur during construction of the Proposed Action at CVG is given in **Table B-3**.

Table B-3
EMISSIONS INVENTORY SUMMARY
PROPOSED TED BUSHELMAN BOULEVARD DEVELOPMENT
Cincinnati/Northern Kentucky International Airport

2017 ANNUAL EMISSIONS SUMMARY						
EMISSION SOURCES	CRITERIA AND PRECURSOR POLLUTANTS (tons per year)					
	CO	VOC	NO _x	SO _x	PM ₁₀	PM _{2.5}
	CAA DE MINIMIS THRESHOLDS					
	100	100	100	100	100	100
Construction Emissions	10.75	16.97	15.13	0.07	2.13	0.93
Operational Emissions	0.14	0.04	0.17	0.00	0.01	0.01
Proposed Project Total	10.89	17.01	15.30	0.07	2.14	0.94

Note: Emissions of CO and PM10 were provided for disclosure purposes.

Source: Landrum & Brown analysis, 2016.

V. SIGNIFICANCE DETERMINATION

The air quality assessment demonstrates that the Proposed Project would not cause an increase in air emissions above the applicable *de minimis* thresholds. Therefore, the Proposed Project conforms to the SIP and the CAA and would not create any new violation of the NAAQS, delay the attainment of any NAAQS, nor increase the frequency or severity of any existing violations of the NAAQS. As a result, no adverse impact on local or regional air quality is expected by construction of the Proposed Project. No further analysis or reporting is required under the CAA or NEPA.

Construction of the Proposed Project would result in short term air quality impacts from exhaust emissions from construction equipment and from fugitive dust emissions from vehicle movement and soil excavation. As provided in Table B-3, emissions due to construction equipment would not exceed applicable thresholds.

While the construction of the Proposed Project would be expected to contribute to fugitive dust in and around the construction site, KCAB as the Sponsor would ensure that all possible measures would be taken to reduce fugitive dust emissions by adhering to guidelines included in FAA Advisor Circular, *Standards for Specifying Construction of Airports*.¹⁸

¹⁸ FAA Advisory Circular, *Standards for Specifying Construction of Airports*, Item P-156, *Temporary Air and Water Pollution, Soil Erosion, and Siltation Control*, AC 150/5370-10G (July 21, 2014).

Methods of controlling dust and other airborne particles will be implemented to the maximum possible extent and may include, but not limited to, the following:

- Exposing the minimum area of erodible earth.
- Applying temporary mulch with or without seeding.
- Using water sprinkler trucks.
- Using covered haul trucks.
- Using dust palliatives or penetration asphalt on haul roads.
- Using plastic sheet coverings.

VI. CLIMATE

Affected Environment

Greenhouse gases (GHG) are gases that trap heat in the earth's atmosphere. Both naturally occurring and man-made GHGs primarily include water vapor (H₂O), carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆). Sources that require fuel or power at an airport are the primary sources that would generate GHGs. Aircraft are probably the most often cited air pollutant source, but they produce the same types of emissions as ground access vehicles.

Research has shown there is a direct correlation between fuel combustion and GHG emissions. In terms of U.S. contributions, the General Accounting Office (GAO) reports that "domestic aviation contributes about three percent of total carbon dioxide emissions, according to EPA data," compared with other industrial sources including the remainder of the transportation sector (20 percent) and power generation (41 percent).¹⁹ The International Civil Aviation Organization (ICAO) estimates that GHG emissions from aircraft account for roughly three percent of all anthropogenic GHG emissions globally.²⁰ Climate change due to GHG emissions is a global phenomenon, so the affected environment is the global climate.²¹

The scientific community is continuing efforts to better understand the impact of aviation emissions on the global atmosphere. The FAA is leading and participating in a number of initiatives intended to clarify the role that commercial aviation plays in GHG emissions and climate. The FAA, with support from the U.S. Global Change Research Program and its participating federal agencies (e.g., National Aeronautics and Space Administration (NASA), National Oceanic and Atmospheric Administration (NOAA), Environmental Protection Agency (EPA), and Department of

¹⁹ *Aviation and Climate Change*. GAO Report to Congressional Committees, (2009).

²⁰ Alan Melrose, "European ATM and Climate Adaptation: A Scoping Study," in *ICAO Environmental Report*. (2010).

²¹ As explained by the U.S. Environmental Protection Agency, "greenhouse gases, once emitted, become well mixed in the atmosphere, meaning U.S. emissions can affect not only the U.S. population and environment but other regions of the world as well; likewise, emissions in other countries can affect the United States." Climate Change Division, Office of Atmospheric Programs, U.S. Environmental Protection Agency, *Technical Support Document for Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act 2-3* (2009).

Energy (DOE)), has developed the Aviation Climate Change Research Initiative (ACCRI) in an effort to advance scientific understanding of regional and global climate impacts of aircraft emissions. FAA also funds the Partnership for Air Transportation Noise & Emissions Reduction (PARTNER) Center of Excellence research initiative to quantify the effects of aircraft exhaust and contrails on global and U.S. climate and atmospheric composition. Similar research topics are being examined at the international level by the International Civil Aviation Organization.²²

Climate Environmental Consequences

Although there are no federal standards for aviation-related GHG emissions, it is well-established that GHG emissions can affect climate.²³ The Council on Environmental Quality (CEQ) has indicated that climate should be considered in NEPA analyses.

The following provides an estimate of GHG emissions. These estimates are provided for information only as no federal NEPA standard for the significance of GHG emissions from individual projects on the environment has been established. Under the No Action Alternative, there would be no increase in project specific GHG emissions. **Table B-4** provides the GHG emissions inventory for 2017.

Table B-4
2017 GHG EMISSIONS INVENTORY
Cincinnati/Northern Kentucky International Airport

Metrics	Annual Metric Tons		
	CO ₂	CH ₄	N ₂ O
Construction	2,887.86	0.1050	0.0111
GWP ₁₀₀	1.00	16.00	196.00
CO _{2e}	2,887.86	2.63	2.8350
CO _{2e} Net Emissions	2,893.32		

CO₂: Carbon Dioxide
 CO_{2e}: Carbon Dioxide equivalent
 CH₄: Methane
 N₂O: Nitrous oxide
 GWP: Global Warming Potential
 Total emissions may not sum exactly due to rounding.
 Source: L&B Analysis, 2016.

²² Lourdes Q. Maurice and David S. Lee. *Chapter 5: Aviation Impacts on Climate*. Final Report of the International Civil Aviation Organization (ICAO) Committee on Aviation and Environmental Protection (CAEP) Workshop. October 29th November 2nd 2007, Montreal.

²³ See *Massachusetts v. E.P.A.*, 549 U.S. 497, 508-10, 521-23 (2007).

Due to construction activity associated with the Proposed Project, GHG emissions would increase by 2,893.32 metric tons over the No Action alternative in 2017. This increase would comprise less than 7.67×10^{-7} percent of U.S. based GHG emissions and less than 1.07×10^{-7} percent of global GHG emissions.²⁴

Climate Cumulative Impacts

The cumulative impact of this Proposed Project on the global climate when added to other past, present, and reasonably foreseeable future actions is not currently scientifically predictable. Aviation has been calculated to contribute approximately 3 percent of global carbon dioxide (CO₂) emissions; this contribution may grow to 5 percent by 2050. Actions are underway within the U.S. and by other nations to reduce aviation's contribution through such measures as new aircraft technologies to reduce emissions and improve fuel efficiency, renewable alternative fuels with lower carbon footprints, more efficient air traffic management, market-based measures and environmental regulations including an aircraft CO₂ standard. The U.S. has ambitious goals to achieve carbon-neutral growth for aviation by 2020 compared to a 2005 baseline, and to gain absolute reductions in GHG emissions by 2050. At present there are no calculations of the extent to which measures individually or cumulatively may affect aviation's CO₂ emissions. Moreover, there are large uncertainties regarding aviation's impact on climate. The FAA, with support from the U.S. Global Change Research Program and its participating federal agencies (e. g., NASA, NOAA, EPA, and DOE), has developed the Aviation Climate Change Research Initiative (ACCRI) in an effort to advance scientific understanding of regional and global climate impacts of aircraft emissions, with quantified uncertainties for current and projected aviation scenarios under changing atmospheric conditions.²⁵

VII. DESCRIPTION OF POLLUTANTS

Ozone (O₃) - Ozone is a pollutant which is not directly emitted, rather, ozone is formed in the atmosphere through photochemical reaction with nitrogen oxides (NO_x), volatile organic compounds (VOC), sunlight, and heat. It is the primary constituent of smog and problems can occur many miles away from the pollutant sources.

People with lung disease, children, older adults, and people who are active can be affected when ozone levels are unhealthy. Numerous scientific studies have linked ground-level ozone exposure to a variety of problems, including:

- lung irritation that can cause inflammation much like a sunburn;
- wheezing, coughing, pain when taking a deep breath, and breathing difficulties during exercise or outdoor activities;

²⁴ U.S. based GHG emission estimated at 6,821.8 million metric tons CO₂ equivalent in Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2010, (April 2012). The IPCC estimates global GHGs in 2004 at 49 Gigatonnes.

²⁵ Nathan Brown, et. al. *The U.S. Strategy for Tackling Aviation Climate Impacts*, (2010). 27th International Congress of the Aeronautical Sciences.

- permanent lung damage to those with repeated exposure to ozone pollution; and
- aggravated asthma, reduced lung capacity, and increased susceptibility to respiratory illnesses like pneumonia and bronchitis.

Carbon Monoxide (CO) - Carbon monoxide is a colorless, odorless gas primarily associated with the incomplete combustion of fossil fuels in motor vehicles. Carbon monoxide combines with hemoglobin in the bloodstream and reduces the amount of oxygen that can be circulated through the body. High carbon monoxide concentrations can lead to headaches, aggravation of cardiovascular disease, and impairment of central nervous system functions. Carbon monoxide concentrations can vary greatly over comparatively short distances. Relatively high concentrations are typically found near crowded intersections, along heavily used roadways carrying slow-moving traffic, and at or near ground level. Even under the most severe meteorological and traffic conditions, high concentrations of carbon monoxide are limited to locations within a relatively short distance of heavily traveled roadways. Overall carbon monoxide emissions are decreasing as a result of the Federal Motor Vehicle Control Program, which has mandated increasingly lower emission levels for vehicles manufactured since 1973.

Volatile Organic Compound (VOC) – Volatile Organic Compounds are gases that are emitted from solids or liquids, such as stored fuel, paint, and cleaning fluids. VOCs include a variety of chemicals, some which can have short and long-term adverse health effects. As previously stated, VOCs are precursor pollutants that react with heat, sunlight and nitrogen oxides (NO_x) to form ozone (O₃). VOC can also mix with other gases to form particulate matter PM_{2.5} as referenced below.

Nitrogen Dioxide (NO₂) - Nitrogen gas, normally relatively inert (unreactive), comprises about 80% of the air. At high temperatures (i.e., in the combustion process) and under certain other conditions it can combine with oxygen, forming several different gaseous compounds collectively called nitrogen oxides (NO_x). Nitric oxide (NO) and nitrogen dioxide (NO₂) are the two most important compounds. Nitric oxide is converted to nitrogen dioxide in the atmosphere. Nitrogen dioxide (NO₂) is a red-brown pungent gas. Motor vehicle emissions are the main source of NO_x in urban areas.

Nitrogen dioxide is toxic to various animals as well as to humans. Its toxicity relates to its ability to form nitric acid with water in the eye, lung, mucus membrane and skin. In animals, long-term exposure to nitrogen oxides increases susceptibility to respiratory infections lowering their resistance to such diseases as pneumonia and influenza. Laboratory studies show susceptible humans, such as asthmatics, exposed to high concentrations of NO₂ can suffer lung irritation and potentially, lung damage. Epidemiological studies have also shown associations between NO₂ concentrations and daily mortality from respiratory and cardiovascular causes and with hospital admissions for respiratory conditions.

While the NAAQS only addresses NO₂, NO and the total group of nitrogen oxides is of concern. NO and NO₂ are both precursors in the formation of ozone and secondary particulate matter. Because of this and that NO emissions largely convert to NO₂, NO_x emissions are typically examined when assessing potential air quality impacts.

Sulfur Dioxide (SO₂) - Sulfur oxides (SO_x) constitute a class of compounds of which sulfur dioxide (SO₂) and sulfur trioxide (SO₃) are of greatest importance. SO₂ is commonly expressed as SO_x since it is a larger subset of sulfur dioxides (SO₂). SO₂ is a colorless gas that is typically identified as having a strong odor and is formed when fuel containing sulfur, like coal, oil and jet fuel, is burned. SO₂ combines easily with water vapor, forming aerosols of sulfurous acid (H₂SO₃), a colorless, mildly corrosive liquid. This liquid may then combine with oxygen in the air, forming the even more irritating and corrosive sulfuric acid (H₂SO₄). Peak levels of SO₂ in the air can cause temporary breathing difficulty for people with asthma who are active outdoors. Longer-term exposures to high levels of SO₂ gas and particles cause respiratory illness and aggravate existing heart disease.

Particulate Matter (PM₁₀ and PM_{2.5}) - Particulate matter includes both aerosols and solid particles of a wide range of size and composition. PM₁₀ is considered coarse particles with a diameter of 10 micrometers or less, and PM_{2.5}, fine particles with a diameter of 2.5 micrometers or less. Emissions of PM_{2.5} are a subset of emissions of PM₁₀. Particulate matter can be any particle of these sizes, including dust, dirt, and soot. Smaller particulates are of greater concern because they can penetrate deeper into the lungs than large particles.

PM_{2.5} is directly emitted in combustion exhaust and formed from atmospheric reactions between various gaseous pollutants including nitrogen oxides (NO_x) sulfur oxides (SO_x) and volatile organic compounds (VOC). PM₁₀ is generally emitted directly as a result of mechanical processes that crush or grind larger particles or the resuspension of dusts, most typically through construction activities and vehicular movements. PM_{2.5} can remain suspended in the atmosphere for days and weeks and can be transported over long distances. PM₁₀ generally settles out of the atmosphere rapidly and is not readily transported over large distances.

The principal health effect of airborne particulate matter is on the respiratory system. Short-term exposures to high PM_{2.5} levels are associated with premature mortality, increased hospital admissions, and emergency room visits. Long-term exposures to high PM_{2.5} levels are associated with premature mortality and development of chronic respiratory disease.

Carbon Dioxide (CO₂) - Carbon dioxide is a colorless, odorless gas produced through the incomplete combustion of fossil fuels. Carbon dioxide is considered to be the most significant greenhouse gas (GHG) that trap heat in the earth's atmosphere. Both naturally occurring and man-made greenhouse gases primarily include CO₂, water vapor (H₂O), methane (CH₄), and nitrous oxide (N₂O). These different chemical species that are emitted have a different effect on climate. The carbon dioxide equivalent (CO_{2e}) method is a way to show relative impacts on climate change of different chemical species.

Lead (Pb) - Lead is a stable compound, which persists and accumulates both in the environment and in animals. In humans, it affects the blood-forming or hematopoietic, the nervous, and the renal systems. In addition, lead has been shown to affect the normal functions of the reproductive, endocrine, hepatic, cardiovascular, immunological, and gastrointestinal systems, although there is significant individual variability in response to lead exposure. Since 1975, lead emissions have been in decline due in part to the introduction of catalyst-equipped vehicles, and decline in production of leaded gasoline. In general, an analysis of lead is limited to projects that emit significant quantities of the pollutant (i.e. lead smelters) and are generally not applied to transportation projects.

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Appendix C

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APPENDIX C

BIOLOGICAL RESOURCES AND WATER RESOURCES

This Appendix includes a copy of the threatened and endangered species surveys and wetland and stream surveys that were completed at the Project Sites, as well as copies of materials related to coordination with the U.S. Fish and Wildlife Service (USFWS), Kentucky Department of Fish & Wildlife Resources (KDFWR), the Kentucky State Nature Preserves Commission (KSNPC), and the U.S. Army Corps of Engineers (USACE). This appendix includes the following documents:

- Wetland and Stream Delineation Report for Sites 6A, 6B, and 6C, dated October 30, 2014
- Threatened and Endangered Species Habitat Assessment Additional 7-acre Portion of Site 6C.
- Submittal to USFWS and KDFWR for CVG Site 6BW of the Ted Bushelman Boulevard Development-Phase II, dated September 23, 2016
- Email from the USFWS Kentucky Field Office outlining the Interim Compliance Process for Projects Requesting a Forest-Dwelling Bat Conservation Memorandum of Agreement (CMOA), dated October 19, 2016
- Letter to USACE with Waiver Request and Nationwide Permit 39 Determination, dated October 11, 2016

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October 30, 2014

Debbie Conrad
Cincinnati/Northern Kentucky International Airport
P.O. Box 752000
Cincinnati, Ohio 45275-2000

RE: KCAB Sites 6A, 6B, and 6C in Boone County, Kentucky
Wetland and Stream Delineation Technical Letter

Dear Ms. Conrad:

Kenton County Airport Board (KCAB) requested a wetland and stream delineation for Sites 6A, 6B, and 6C in Boone County, Kentucky. The three sites are located along Ted Bushelman Boulevard and total approximately 129 acres in size (Figure 1). *Environment & Archaeology, LLC* performed the delineation on August 21 and 22, and September 8, 2014. The site consisted primarily of upland deciduous forest and old field. The field survey identified five (5) intermittent streams, twelve (12) ephemeral streams, eight (8) palustrine emergent wetlands, one (1) vernal pool wetland, and one (1) palustrine emergent/forested wetland within the survey area (Figure 3). The attached photograph log illustrates the proposed site and documents the identified vegetational communities. This technical letter provides a summary of the available map reviews and data collected during the survey.

METHODOLOGY

Environment & Archaeology, LLC utilized the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Eastern Mountains and Piedmont Region Regional Supplement Version 2* (U.S. Army Corps of Engineers 2012). This methodology calls for a step-by-step approach to the delineation which identifies the presence or absence of three factors: hydrophytic vegetation, hydric soils, and wetland hydrology. Each factor must be present if a location is to be considered a wetland. Prior to visiting the site, relevant resource information on the proposed project area was reviewed to determine the potential presence of wetlands, including: U.S. Geological Survey 7.5' topographic quadrangle maps, U.S. Department of Agriculture, Natural Resource Conservation Service (USDA, NRCS) soil surveys, and National Wetlands Inventory Maps.

After a review of the agency resource information, *Environment & Archaeology, LLC* conducted a field delineation of the survey area, utilizing the routine on-site method for delineation. Representative plots were taken within the survey area wherever a change in the vegetation, soils, or hydrology became apparent. During sampling, a determination was made as to whether the plot was a wetland or upland site. If an area was determined to be a wetland site, additional sampling of vegetation, soils and hydrology was performed to determine the boundaries of the wetland area.

Dominant vegetation was determined by estimating percent areal coverage for the most prevalent species which cumulatively totaled 50 percent of the areal coverage along with any other single species accounting for at least 20 percent coverage within a plot. Each identified dominant species was assigned its pertinent wetland indicator status according to the 2014 National Wetland Plant List (http://rsgisias.crrel.usace.army.mil/nwpl_static/data/docs/lists_2014/States/pdf/KY_2014v1.pdf), with all field data recorded on a Eastern Mountains and Piedmont Region Routine Wetland Determination Data Form (Version 2.0). Field notes were collected on any observed runoff features, as well as conveyance channels that provided justification of 'connectivity' for a surface water.

The location of the streams and wetlands within the survey area were flagged and global positioning system (GPS) data was collected at each of these points with a handheld GPS unit capable of sub-meter accuracy. GPS data points were downloaded into the Arcview geographic information system mapping program and then overlaid atop various resource maps - USGS topographic maps, NWI maps, USDA soil surveys, and aerial maps. Each wetland area was photo-documented, then described in accordance with characteristics assigned by Cowardin, et al. (1979) (Attachment). Total size of each identified wetland area was determined utilizing the GPS data collected in the field and measured utilizing the computer software ArcGIS. All identified streams were assessed using the Kentucky Department of Environmental Protection Habitat Assessment Sheets and photo-documented (Attachment).

All statements presented in this report concerning potentially jurisdictional or non-jurisdictional waters of the United States are considered preliminary until the U.S. Army Corps of Engineers provides written concurrence with the report's findings. All stream lengths and wetland acreage are approximate. Stream lengths were rounded to the nearest foot while wetland acreage was rounded to the nearest one-hundredth of an acre.

AGENCY RESOURCE INFORMATION

Prior to initiation of the field survey, *Environment & Archaeology, LLC* reviewed available agency resource information to determine the likelihood of wetlands and streams present on the site. National Wetlands Inventory (NWI) maps have been prepared for the site by the U.S. Fish and Wildlife Service. The USDA Soil Survey of Boone County, Kentucky, has also been published. All agency resource data has been digitized for use in GIS mapping programs.

U.S. Geological Survey (USGS) Map

The parcel was located on the Burlington, Kentucky, USGS 7.5' topographic quadrangle (Figure 1). Topography within the study area was gently to steeply sloping, and is located within the Gunpowder Creek watershed (HUC 05090203). Gunpowder Creek is defined as a warm-water aquatic habitat by the Kentucky Division of Water; the stream is not identified as a Special Resource Water. One unnamed intermittent tributary to Gunpowder Creek is illustrated on the USGS map within the survey area; this stream was identified as Stream 7 during the field survey.

National Wetland Inventory (NWI) Map

The study area was located on the Burlington, Kentucky, USGS 7.5' NWI quadrangle. The United States Fish and Wildlife Service has made the NWI maps available on-line for use in geographic information systems mapping programs (Figure 1). One persistent, semipermanently flooded, impounded palustrine emergent wetland (PEM1Fh) was mapped within the survey area; this wetland was identified as Wetland 3 during the field survey.

Note that the NWI data does not preclude the possible existence of additional wetlands in the area. NWI maps utilize high altitude, stereoscopic, aerial photography, and is partially dependent on the conditions at the time of the photograph. NWI mapping limitations can occur in the following situations: accurately identifying locations and extents of small wetlands, wetlands within evergreen forests, some aquatic bed wetlands, and when mapping efforts were conducted during drier seasons or a period of drought conditions.

Natural Resources Conservation Service (NRCS) Soil Survey

The Soil Survey of Boone, Campbell, and Kenton Counties, Kentucky (USDA 1973, 1989) identified six soil types within the study areas (Figure 2). These soil types, as well as their hydric status, are presented in Table 1. None of the soils have been classified as hydric by the USDA. Hydric soils are soils which formed under saturated conditions. The presence of hydric soils on a site indicates the historical presence of conditions which would favor the development of wetlands. The presence of hydric soil types on a site does not, however, guarantee the presence of wetlands. Due to changes in vegetational patterns and drainage, areas of hydric soils may be sufficiently modified to prevent the presence of wetland hydrology and hydrophytic vegetation. Note that most of the upland areas within the proposed aircraft apron portion have been filled with spoil soil material.

Table 1. Soil types located within the Sites 6A, 6B, and 6C Project in Boone County, Kentucky.

Symbol	Soil Type	Hydric Status	Drainage Class
AsB	Ashton silt loam, 2 to 6% slopes (occasionally flooded)	Non-hydric	Well-drained
JeD	Jessup silt loam, 12 to 20% slopes	Non-hydric	Well-drained
JsD3	Jessup silty clay loam, 12 to 20% slopes	Non-hydric	Well-drained
Ln	Lindside silt loam, 0 to 3% slopes (occasionally flooded)	Non-hydric	Moderately well-drained
RsB	Rossmoyne silt loam, 0 to 6% slopes	Non-hydric	Moderately well-drained
RsC	Rossmoyne silt loam, 6 to 12% slopes	Non-hydric	Moderately well-drained

RESULTS

The site consisted primarily of old field and upland deciduous forest. Old field vegetation was identified primarily along ridgetops and near roadways. Vegetation included: Canada goldenrod (*Solidago canadensis*), red clover (*Trifolium pratense*), Queen Anne's lace (*Daucus carota*), yellow clover (*Melilotus officinales*), blackberry (*Rubus argutus*), tall fescue (*Festuca arundinaceae*), tall ironweed (*Vernonia angustifolia*), and crown vetch (*Securigera varia*).

Deciduous forest was identified primarily along stream and drainage corridors. Dominant canopy vegetation included: sugar maple (*Acer saccharum*), box elder (*Acer negundo*), hackberry (*Celtis occidentalis*), black cherry (*Prunus serotina*), slippery elm (*Ulmus americana*), black walnut (*Juglans nigra*), and black locust (*Robina pseudoacacia*). The understory vegetation was dominated by bush honeysuckle (*Lonicera maackii*) and multiflora rose (*Rosa multiflora*).

The field survey identified eight (8) palustrine emergent wetlands, one (1) vernal pool, one (1) palustrine emergent/forested wetland, twelve (12) ephemeral streams, and five (5) intermittent streams within the survey area. All of the streams scored within the "poor" range of the Kentucky Department of Environmental Protection Habitat Assessment Sheets.

One wetland, Wetland 8, was provisionally classified as isolated. It was located along a ridge within a previously graded area. The wetland was located within a depression, "pocket", area with no discernable drainage connected the wetland to another waterbody feature. Wetland 8 appears to be both horizontally and vertically isolated. The remaining nine (9) wetlands and seventeen (17) streams were provisionally classified as waters of the US.

One additional data point was taken for a non-wetland area located at the toe of a hillslop. The area exhibited hydric soils but not hydrology or hydrophytic vegetation. Therefore, it was classified as upland. All wetland and stream datasheets are located in the attachments.

This report reflects the professional opinion of *Environment & Archaeology, LLC*. Formal determination of jurisdiction can only be determined by the ACOE through submittal of a Jurisdictional Determination request submitted by KCAB. The identified waterbodies are listed in the Waterbody Summary Table (Table 2).

Table 2: Waterbodies located within the Site 6A, 6B, and 6C Project Area.							
Waterbody#	Waterbody Type¹	RBP Score²	Provisional Hydrologic Status	Stream Bank Width (ft)	Water Depth (in)	Linear Footage	Acreage
Streams							
S1	Intermittent	100	Connected	3 to 8	6 to 12	888	0.11
S2	Ephemeral	107	Connected	2 to 3	1 to 3	240	0.01
S3	Ephemeral	94 and 96	Connected	2 to 4	2 to 4	501	0.03
S4	Ephemeral	68	Connected	2 to 3	1 to 2	202	0.01
S5	Ephemeral	74	Connected	1 to 3	1 to 4	165	0.01
S6	Ephemeral	93	Connected	3 to 4.5	1 to 4	722	0.07
S7	Intermittent	108, 92, and 110	Connected	2 to 11	1 to 12	4,811	0.72
S8	Intermittent	75 and 98	Connected	1 to 5	3 to 10	847	0.06
S9	Intermittent	97	Connected	1 to 4	2 to 6	554	0.03
S10	Ephemeral	84	Connected	1.5 to 3	2 to 6	240	0.01
S11	Ephemeral	82	Connected	2 to 5	1 to 4	464	0.04
S12	Ephemeral	76	Connected	1 to 2.5	1 to 4	148	0.01
S13	Intermittent	114	Connected	2 to 3	3 to 4	484	0.03
S14	Ephemeral	91	Connected	1 to 2	1 to 3	111	<0.01
S15	Ephemeral	73	Connected	1 to 3	1 to 3	126	<0.01
S16	Ephemeral	65	Connected	1 to 2	4 to 5	130	<0.01
S17	Ephemeral	82	Connected	1 to 3	3 to 4	60	<0.01
Wetlands							
W1	PEM	N/A	Connected	N/A	0	N/A	0.02
W2	PEM	N/A	Connected	N/A	0	N/A	0.03
W3	PEM/PFO	N/A	Connected	N/A	0-2	N/A	0.94
W4	PEM	N/A	Connected	N/A	0-3	N/A	0.12
W5	PEM	N/A	Connected	N/A	0-2	N/A	0.01
W6	PEM	N/A	Connected	N/A	0	N/A	0.06
W7	PEM	N/A	Connected	N/A	0	N/A	0.05

Table 2: Waterbodies located within the Site 6A, 6B, and 6C Project Area.							
Waterbody#	Waterbody Type¹	RBP Score²	Provisional Hydrologic Status	Stream Bank Width (ft)	Water Depth (in)	Linear Footage	Acreage
W8	PEM	N/A	Isolated	N/A	0	N/A	0.02
W9	PEM	N/A	Connected	N/A	0	N/A	0.02
W10	PEMC2 (Vernal Pool)	N/A	Connected	N/A	0	N/A	0.02
			Wetland	PEM		N/A	0.31 acre
			Wetland	PEM isolated		N/A	0.02 acre
			Wetland	PEM/PFO		N/A	0.94 acre
			Wetland	PEMC2 (Vernal Pool)		N/A	0.02 acre
			Stream	Ephemeral		3,663	0.25 acre
			Stream	Intermittent		7,030	0.92 acre
Waterbodies Total						10,693	2.46 acre

SUMMARY

Development of the Project Area could qualify under Nationwide Permit #39: Commercial and Institutional Developments from the US Army Corps of Engineers (USACE) provided the following impact limits are not exceeded:

- ½ acre of waters of the US (wetlands and streams); and
- 300 linear feet of stream bed. Note that this limit can be waived by the District Engineer for intermittent and ephemeral impacts.

A pre-construction notification to the USACE is required for any impacts to waters of the US. The Nationwide Permit program requires compliance with the Endangered Species Act and Section 106. If a waiver is not granted by the USACE District Engineer and/or the conditions of NWP #39 cannot be met, then an Individual Section 404 Permit would be required.

The Kentucky Division of Water has approved NWP #39 with conditions. These conditions include limiting perennial and intermittent stream impacts to 300 linear feet. Impacts to ephemeral streams are not limited.

A jurisdictional determination through the USACE would be required to verify that Wetland 8 is considered isolated. This process could take 30 days or more depending upon the USACE backlog. This determination is best accomplished during the permit application submittal process. KCAB can elect to include Wetland 8 in the preliminary jurisdiction form, if it is determined to be in their best interests (i.e. expediency). The enclosed preliminary jurisdiction form does not include Wetland 8.

If you should require additional information or have any questions regarding this project, please contact me at (865) 560-1601.

Sincerely,

Carol McKnight
Senior Project Manager

Attachments: Figures - USGS topographic map/NWI, Soil map, Aerial map, FEMA map
Photolog
USACE Wetland Delineation Datasheet
Kentucky Rapid Bioassessment Protocol Datasheet
Preliminary Jurisdictional Determination Form

Figures

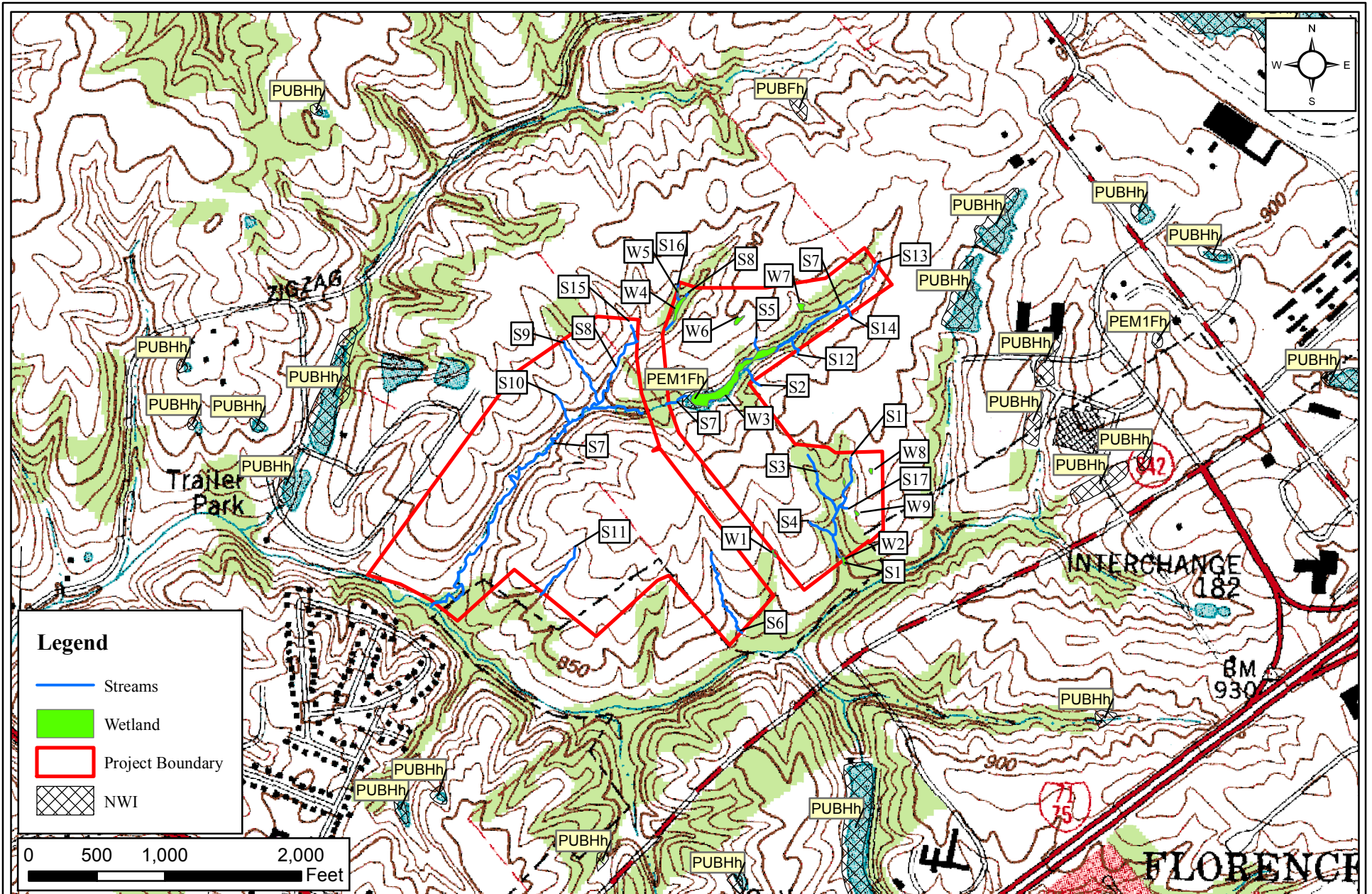


Figure 1

Kenton County Airport Board
 Cincinnati/Northern Kentucky International Airport
 Site 6-A, 6-B, and 6-C Project
 Boone County, Kentucky

USGS 7.5' Topographic Map with NWI Overlay
 Burlington, Kentucky, Quadrangle
 1:12,000
 Environment and Archaeology, LLC

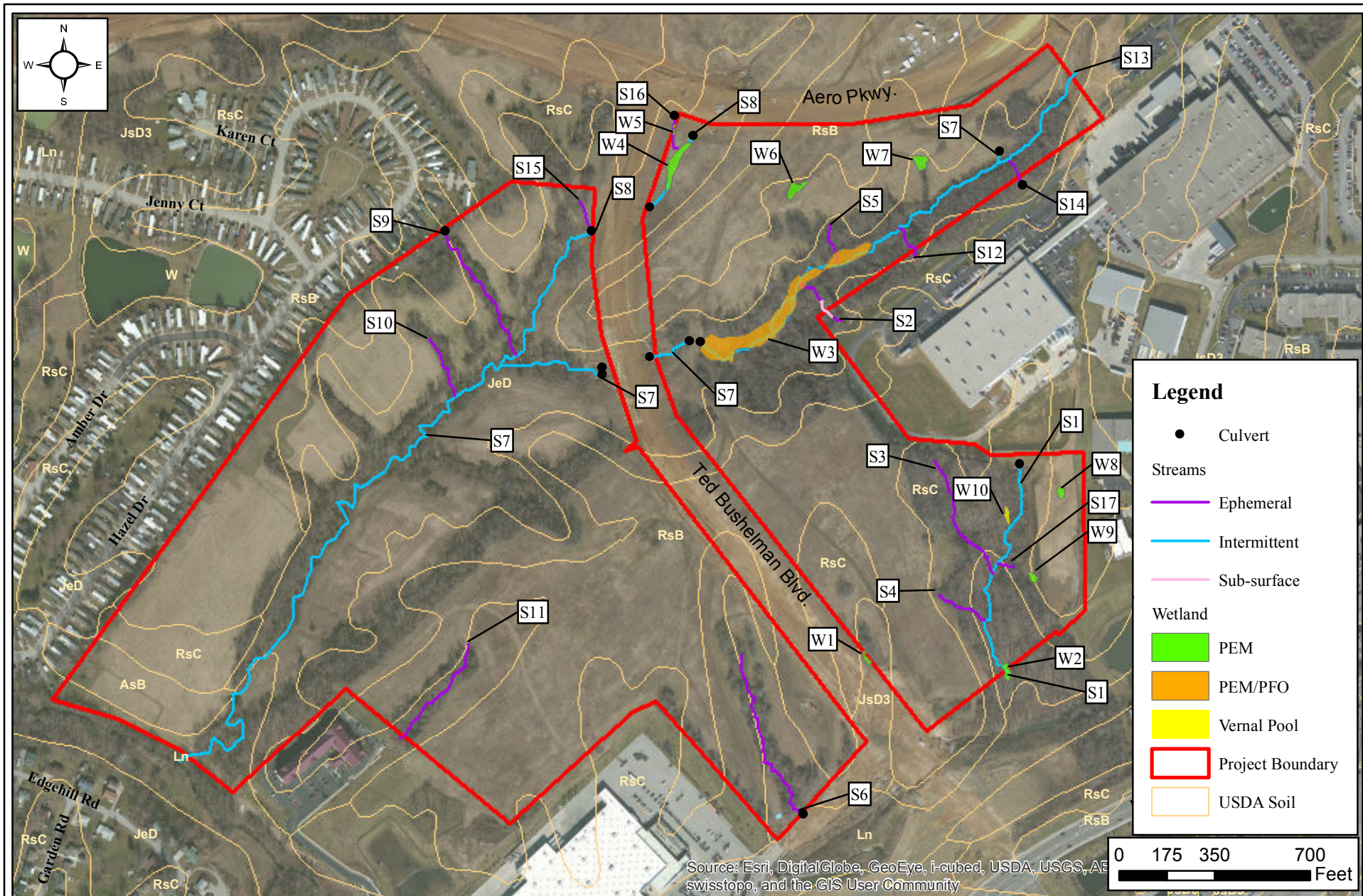


Figure 2

Kenton County Airport Board
 Cincinnati/Northern Kentucky International Airport
 Site 6-A, 6-B, and 6-C Project
 Boone County, Kentucky

Aerial Map with USDA Soils
 Aerial provided by ESRI Map Services
 1:6,000
 Environment and Archaeology, LLC

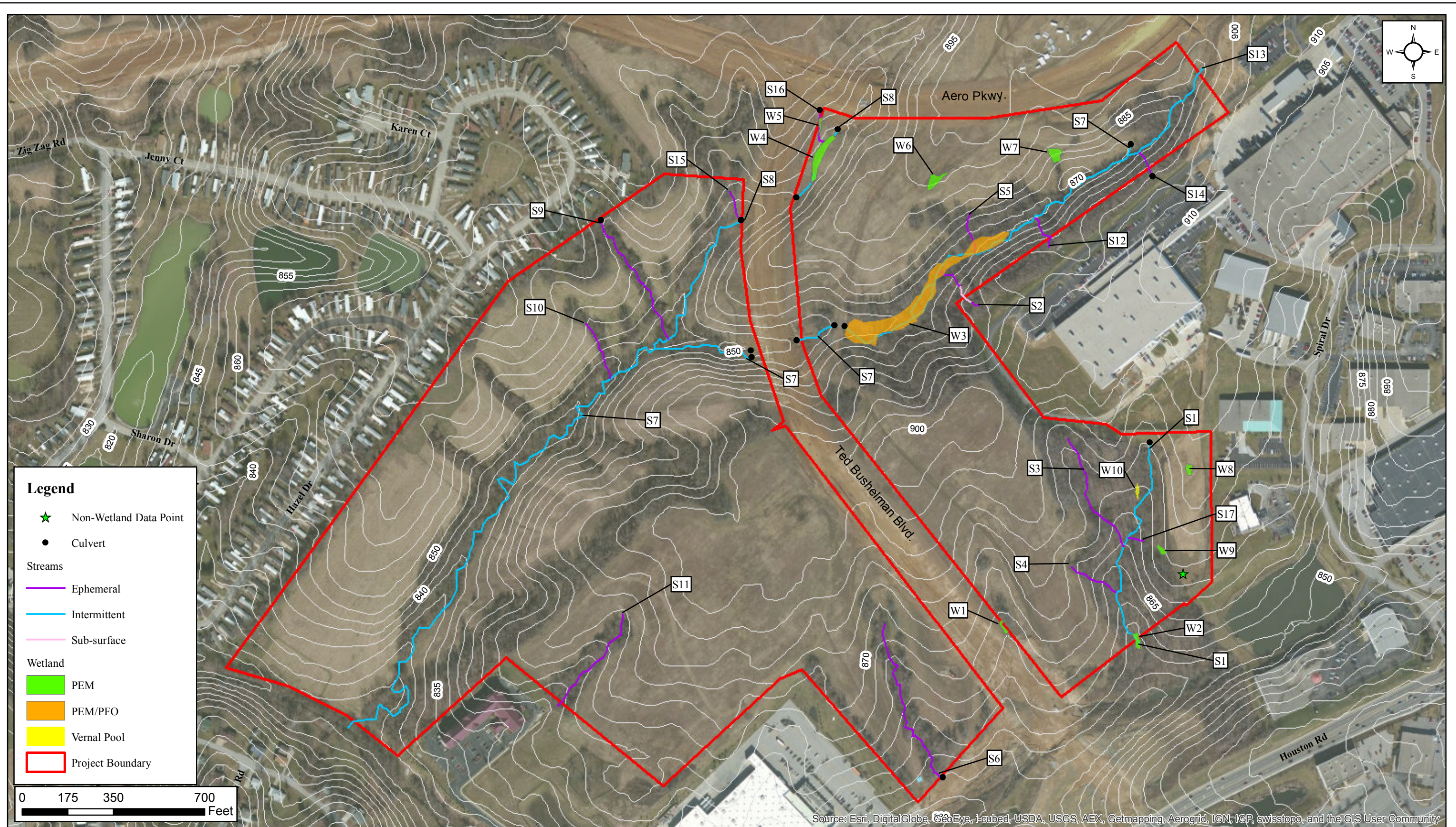


Figure 3

Kenton County Airport Board
 Cincinnati/Northern Kentucky International Airport
 Site 6-A, 6-B, and 6-C Project
 Boone County, Kentucky

Aerial Map
 Aerial provided by ESRI Map Services
 1:4,200
 Environment and Archaeology, LLC

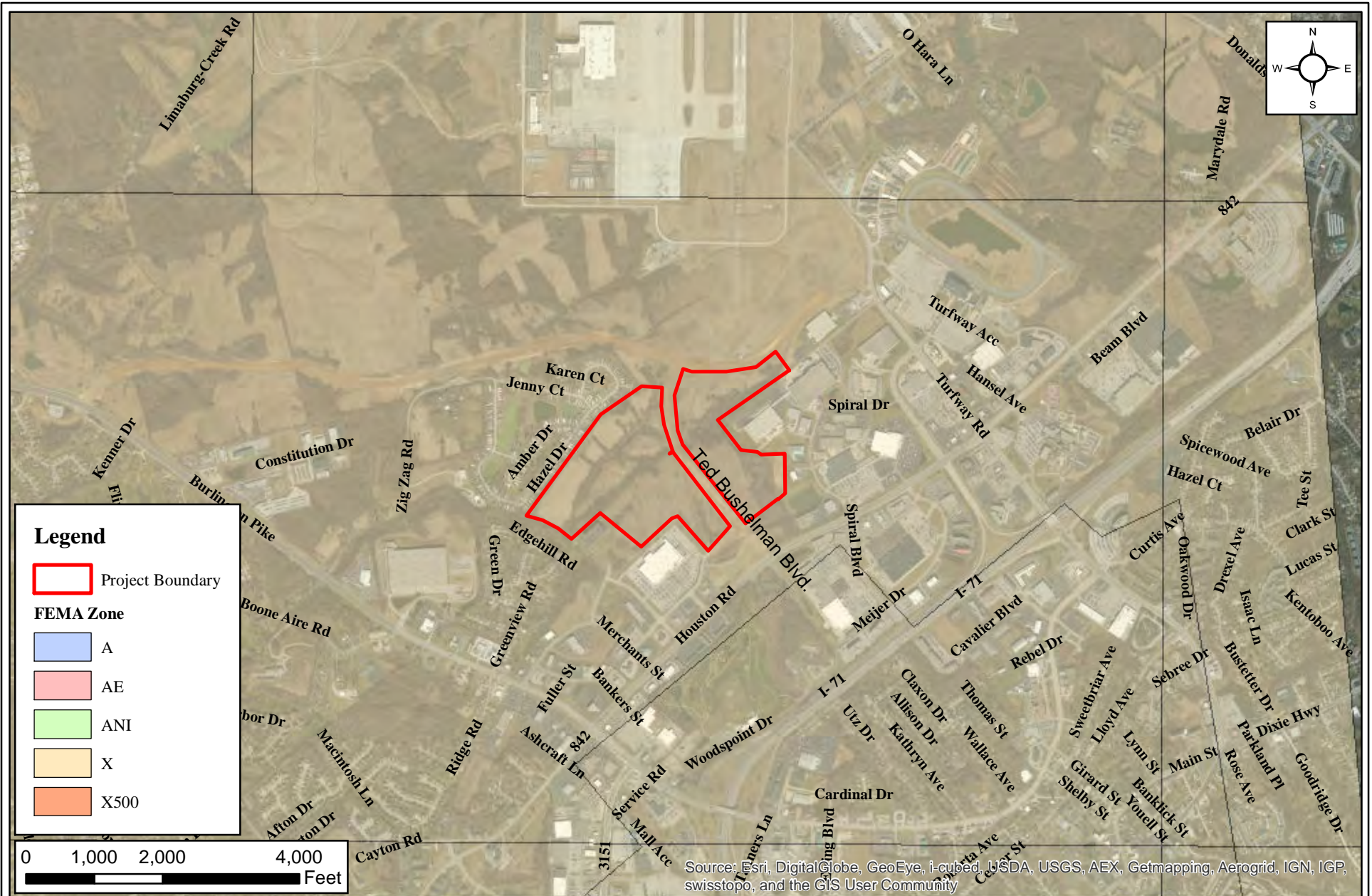


Figure 4

Kenton County Airport Board
 Cincinnati/Northern Kentucky International Airport
 Site 6-A, 6-B, and 6-C Project
 Boone County, Kentucky

Aerial Map with FEMA
 Aerial provided by ESRI Map Services
 1:24,000
 Environment and Archaeology, LLC

October 4, 2016

Sarah Potter
Landrum & Brown
11279 Cornell Park Drive
Cincinnati, Ohio 45242
spotter@landrum-brown.com

Re: Threatened and Endangered Species Habitat Assessment

7-acre portion of CVG Site 6CW-1
Ted Bushelman Boulevard Development
Cincinnati/Northern Kentucky International Airport in Boone County, Kentucky

Dear Ms. Potter:

Environment & Archaeology, LLC has completed a habitat assessment of federally-listed threatened and endangered species within properties of the Cincinnati/Northern Kentucky International Airport (CVG). The Kenton County Airport Board (KCAB) retained *Environment & Archaeology, LLC* to perform a field survey of the survey area, totaling approximately seven (7) acres on September 26, 2016. This letter provides an assessment of threatened and endangered species habitat within the seven-acre survey area.

The site is shown on the Burlington USGS 7.5-minute topographic quadrangle map (Figure 1). The surrounding land consists of urban/industrial development and the Survey Area is currently undeveloped airport property. The survey area occurs within the watershed of Gunpowder Creek (HUC 12: 05090203) of the Ohio River basin within Boone County, Kentucky. *Environment & Archaeology, LLC* conducted a formal wetland and stream delineation (KCAB Sites 6A North) in Boone County, Kentucky) on July 1, 2015 and identified one (1) ephemeral stream and one (1) wetland within the survey area. Table 1 itemizes the surface waters within the Survey Area and Figure 2 provides the location of the forested areas and other natural areas. A photolog providing representative photographs of the survey area is provided with this letter.

1.0 THREATENED AND ENDANGERED SPECIES IN BOONE COUNTY, KENTUCKY

A review of the U.S. Fish and Wildlife Service's Information, Planning, and Conservation System (IPAC) and county list determined that eleven (11) threatened, endangered or proposed endangered species have ranges within the Survey Area. The species have been identified below in Table 2 and the IPAC has been included as an attachment.

Table 1. Waterbody Summary Table in Survey Area.

Waterbody#	Waterbody Type ¹	RBP Score ²	Provisional Hydrologic Status	Stream Bank Width (ft)	Water Depth (in)	Linear Footage	Acreage
S-15	Ephemeral	73	Connected	1 to 3	1 to 2	145	0.01
W-11	PEM	--	Connected	--	Saturated	N/A	0.03
			Stream	Ephemeral		145	0.01 acre
			Wetland	PEM		--	0.03
Waterbodies Total							0.04 acre

Table 2. Threatened/Endangered Species Known to Have Ranges in the Survey Area.

Common Name	Scientific Name	Status
Mammals		
Gray Bat	<i>Myotis grisescens</i>	Endangered
Indiana Bat	<i>Myotis sodalist</i>	Endangered
Northern Long-Eared Bat	<i>Myotis septentrionalis</i>	Threatened
Mussels		
Clubshell	<i>Pleurobema clava</i>	Endangered
Pink Mucket	<i>Lampsilis abrupta</i>	Endangered
Orangefoot pimpleback	<i>Plethobasus cooperianus</i>	Endangered
Sheepnose	<i>Plethobasus cyphus</i>	Endangered
Rough pigtoe	<i>Pleurobema plenum</i>	Endangered
Fanshell	<i>Cyprogenia stegaria</i>	Endangered
Ring Pink	<i>Obovaria retusa</i>	Endangered
Plants		
Running Buffalo Clover	<i>Trifolium stoloniferum</i>	Endangered

2.0 POTENTIAL THREATENED/ENDANGERED SPECIES HABITAT IN THE SURVEY AREA

Gray Bat

Gray bats inhabit caves year-round. In the winter, the gray bat hibernates in deep vertical caves. In the summer, they roost in caves scattered along rivers. There was no karst topography within the Survey Area and no caves were identified within or adjacent to the Survey Area during habitat survey on September 26, 2016. Therefore, the Survey Area does not contain the required habitat for the gray bat.

Indiana Bat/Northern Long-Eared Bat

The Survey Area is not located within known habitat for any of the Myotid species, but does occur within potential habitat of each of the species. Suitable habitat for the Indiana and northern long-eared bats includes roosting and foraging habitat, travel corridors, and hibernacula. The Myotids' winter habitat requirements consists of hibernacula needs, including caves and, to a lesser extent, abandoned mines where the ambient temperature remains below 50°F but rarely drops below freezing. There were no caves or abandoned mines identified within the Survey Area.

The USFWS Kentucky Field Office (KFO) has developed the Conservation Strategy for Forest-Dwelling Bats in the Commonwealth of Kentucky. The KFO uses the follow definitions for roost trees:

- “Suitable Indiana bat primary maternity roost tree” refers to a dead or partially dead tree that is at least 9 inches in diameter at breast height (DBH) and has cracks, crevices, and/or loose or exfoliating bark.
- “Optimal Indiana bat primary maternity roost tree” refers to trees with the characteristics above that are in excess of 16 inches DBH.
- “Suitable roost tree” refers to a tree (live or dead) that exhibits any of the following characteristics: exfoliating bark, crevices or cracks. Indiana and/or northern long-eared bats typically roost under exfoliating bark, in cavities of dead, dying, and live trees, and in snags (i.e., dead trees or dead portions of live trees). For Indiana bats, suitable roost trees will have a DBH of 5 inches or greater; for northern long-eared bats, the minimum DBH is 3 inches and includes trees with cavities in addition to the above-mentioned characteristics attributable to Indiana bat roosts.

Summer habitat refers to suitable summer habitat used by any Indiana bat or northern long-eared bat, regardless of reproductive condition. For northern long-eared bat, known summer habitat occurs within three (3) miles of a capture location or 1.5 miles of a documented roost tree. Maternity roost trees are typically within canopy gaps in a forest, in a fence-line, and along the edges of wooded areas, frequently associated with streams, floodplain, forests, forested wetlands, and impounded water bodies. Travel corridors are areas that link roosting and foraging habitat, including open-understory forest, wooded fence-rows, and open paths through wooded areas, including streams, trails, and small roads with canopy cover.

The wooded areas within the Survey Area were observed to be in a state of decline. Honeysuckle monopolized the understory, leaving a sparse herbaceous layer. Brambles (*Rubus* spp., *Rosa multiflora*), and Japanese honeysuckle (*Lonicera japonica*) bordered the woodland edges. The field survey identified nine (9) trees in the Survey Area possessing characteristics of a suitable primary or optimal primary tree.

Although, the Survey Area is located outside of known forest-dwelling bat habitat; the area is designated as Potential Habitat by the USFWS, Kentucky Field Office (KFO). Impacts to potential habitat requires mitigation per guidelines of the KFO *Conservation Strategy for Forest-Dwelling Bats*. The current rate for mitigation is \$3,250.00/acre if the habitat is removed between April 1 and October 14th, or half of said amount (\$1,625.00) if between October 15th and March 31st. At this time, the Conservation Strategy does not permit tree removal in June or July.

Payment into the Imperiled Bat Conservation Fund (IBCF) will be required for tree clearing within the Survey Area to satisfy the IBCF mitigation requirements. Tree acreage within the Survey Area is approximately 2.42 acres. A list of the trees identified to be suitable roost trees is attached. The table outlines the species, alive/dead status, DBH, and roost tree designation.

Mussels

According to the USFWS IPaC and county list, there are seven mussel species with the potential to be located within the proposed Survey Area. A review of the required habitat for each of the mussel species and threat status via NatureServe was performed (<http://explorer.natureserve.org/servlet/NatureServe?init=Species>). The seven mussel species require medium to large streams/ivers with, in general, gravel/sand/cobble substrates and fast-flowing water. One of the threats to all of the seven listed mussel species are impoundments.

The Survey Area contains only one ephemeral channel that lacks morphology, flow regime and substrate necessary to support the listed mussel species. The stream channel had a silt/clay substrate. Therefore, the Survey Area does not contain the required habitat for any of the mussel species and will not affect the protected mussel species.

Running Buffalo Clover

Suitable habitat for the running buffalo clover is typified by mesic woodlands in partial to filtered sunlight, where there is a pattern of moderate periodic disturbance for a prolonged period, such as mowing, trampling, or grazing. It is most often found in regions underlain with limestone or other calcareous bedrock, but not exclusively. It has been reported from a variety of disturbed woodland habitats, including blue-ash savannahs, floodplains, streambanks, shoals (especially where old trails cross or parallel intermittent streams), grazed woodlots, mowed paths (e.g. cemeteries and lawns), old logging roads, jeep trails, skidder trails, mowed wildlife openings within mature forests, and steep, weedy ravines.

Christina Lovins, a USFWS Qualified Running Buffalo Clover Surveyor, performed the field survey on September 26, 2016. The Survey Area is dominated by open land cover of old field growth subjected to full sun; the open land has been disturbed by roadway construction to the north and east. All areas of old field growth is routinely mowed for maintenance purposes. The areas of woodland habitat is occupied with dense honeysuckle growth. Based on the existing site conditions, development within the Survey Area is not anticipated to affect running buffalo clover.

3.0 MIGRATORY BIRDS OF CONSERVATION CONCERN

A review of the U.S. Fish and Wildlife Service's Information, Planning, and Conservation System (IPAC) list determined that 21 species have ranges within the Survey Area. The species have been identified below in Table 3 and the IPaC has been included as an attachment.

Based on the mobility of the avian species listed within Table 3, we conclude that development within the Survey Area is not likely to have an adverse effect on the Migratory Birds of Conservation Concern Listed to Have Ranges in the Survey Area.

Table 3 Migratory Birds of Conservation Concern Listed to Have Ranges in Survey Area.

Common Name	Scientific Name	Seasonal Occurrence in Survey Area	Potential for Future Development to Impact Species
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Year-Round	No habitat found; nearest large body of water (Ohio River) is 4 miles north of Survey Area.
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	Breeding	No anticipated impact due to mobility of species and available surrounding habitat
Blue-winged Warbler	<i>Vermivora pinus</i>	Breeding	
Cerulean Warbler	<i>Dendroica cerulean</i>	Breeding	
Chuck-will's-widow	<i>Caprimulgus carolinensis</i>	Breeding	
Dickcissel	<i>Spiza Americana</i>	Breeding	
Fox Sparrow	<i>Passerella liaca</i>	Wintering	
Henslow's Sparrow	<i>Ammondramus henslowii</i>	Breeding	
Kentucky Warbler	<i>Oporornis formosus</i>	Breeding	
Least Bittern	<i>Ixobrychus exilis</i>	Breeding	
Loggerhead Shrike	<i>Lanius ludovicianus</i>	Year- Round	
Peregrine Falcon	<i>Falco peregrinus</i>	Breeding	
Prairie Warbler	<i>Dendroica discolor</i>	Breeding	
Prothonotary Warbler	<i>Protonotaria citrea</i>	Breeding	
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	Year-Round	
Rusty Blackbird	<i>Euphagus carolinus</i>	Wintering	
Sedge Wren	<i>Cistothorus platensis</i>	Migrating	
Short-Eared Owl	<i>Asio flammeus</i>	Wintering	
Willow Flycatcher	<i>Empidonax traillii</i>	Breeding	
Wood Thrush	<i>Hylocichla mustelina</i>	Breeding	
Worm Eating Warbler	<i>Helmitheros vermivorum</i>	Breeding	

4.0 SUMMARY

The proposed CVG Site 6CW-1 survey area encompassed an approximate 7-acre area of open, old field growth and containing approximately 2.42 acres of woodland. The parcel contained approximately 145 feet of ephemeral stream and 0.03 acres of palustrine emergent wetland. It is the professional opinion of *Environment & Archaeology, LLC*, that there will be no effect to the listed species due to the following:

- Suitable stream habitat is lacking for the listed mussel species;
- Site conditions do not support habitat for running buffalo clover;
- Based on the mobility of the avian species listed within Table 3, we conclude that future development within the Survey Area is not likely to have an adverse effect on the Migratory Birds of Conservation Concern Listed to Have Ranges in the Survey Area; and
- Mitigation efforts via contribution into the Imperiled Bat Conservation Fund (IBCF) will compensate for tree removal and any potential Myotid bat habitat impacts.

Please contact me at (865) 560-1601 for any additional information.

Sincerely,



Jenny Sunday
Project Manager

Enclosures (4):

- 1- Location Maps – USGS Topographic Map, Aerial Imagery Map
- 2- Habitat Photographs
- 3- Bat Roost Tree Inventory
- 4- USFWS Information, Planning, and Conservation System (IPaC) Trust Resources Report

Enclosure 1
Location Maps –
USGS Topographic Map, Aerial Imagery Map

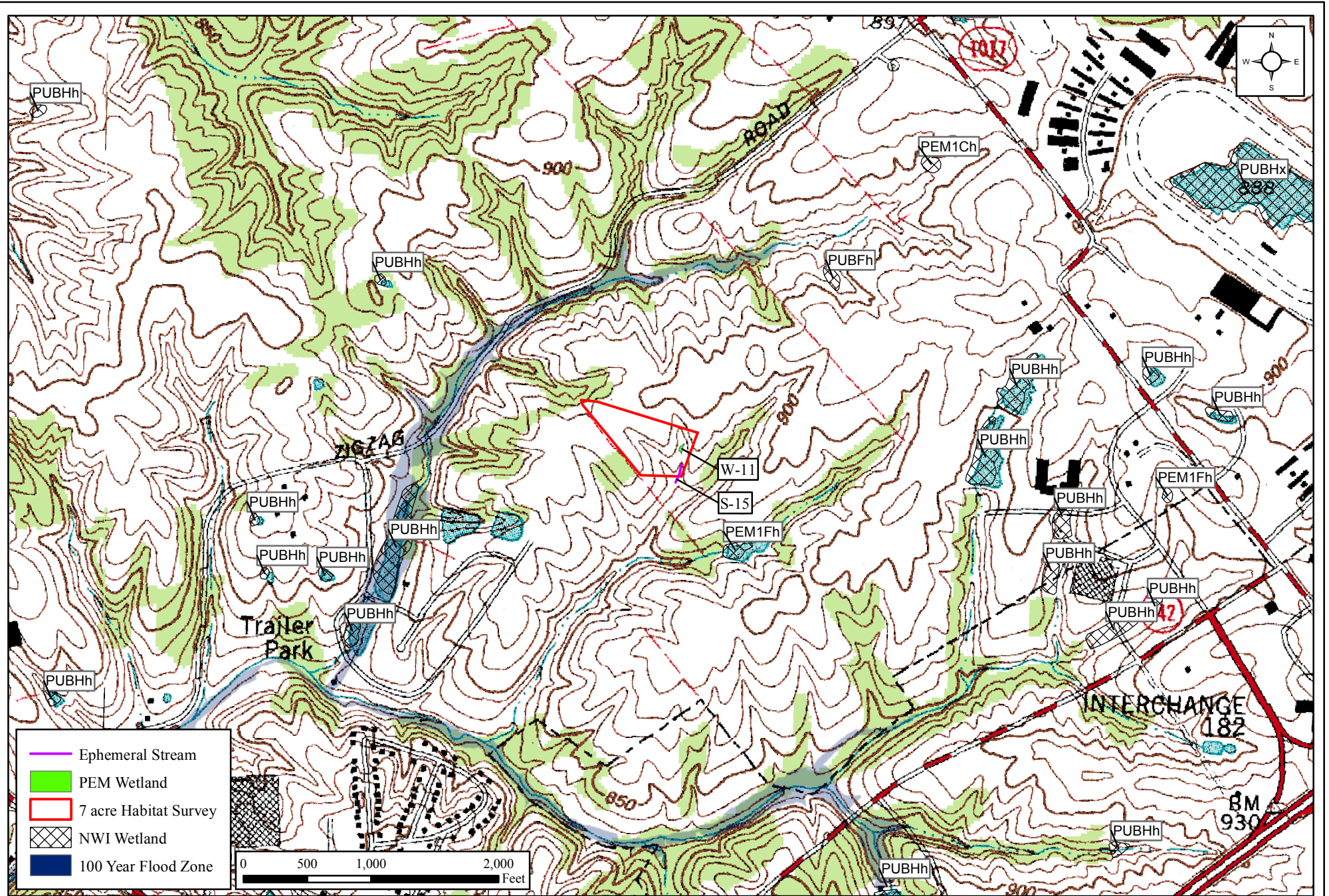


Figure 1	Kenton County Airport Board Cincinnati/Northern Kentucky International Airport Ted Bushelman Boulevard Development Site 6CW-1 - 7 acre Habitat Survey Boone County, Kentucky	USGS 7.5' Topographic Map Burlington, KY Quadrangle 1:12,000 <i>Environment & Archaeology</i> LLC
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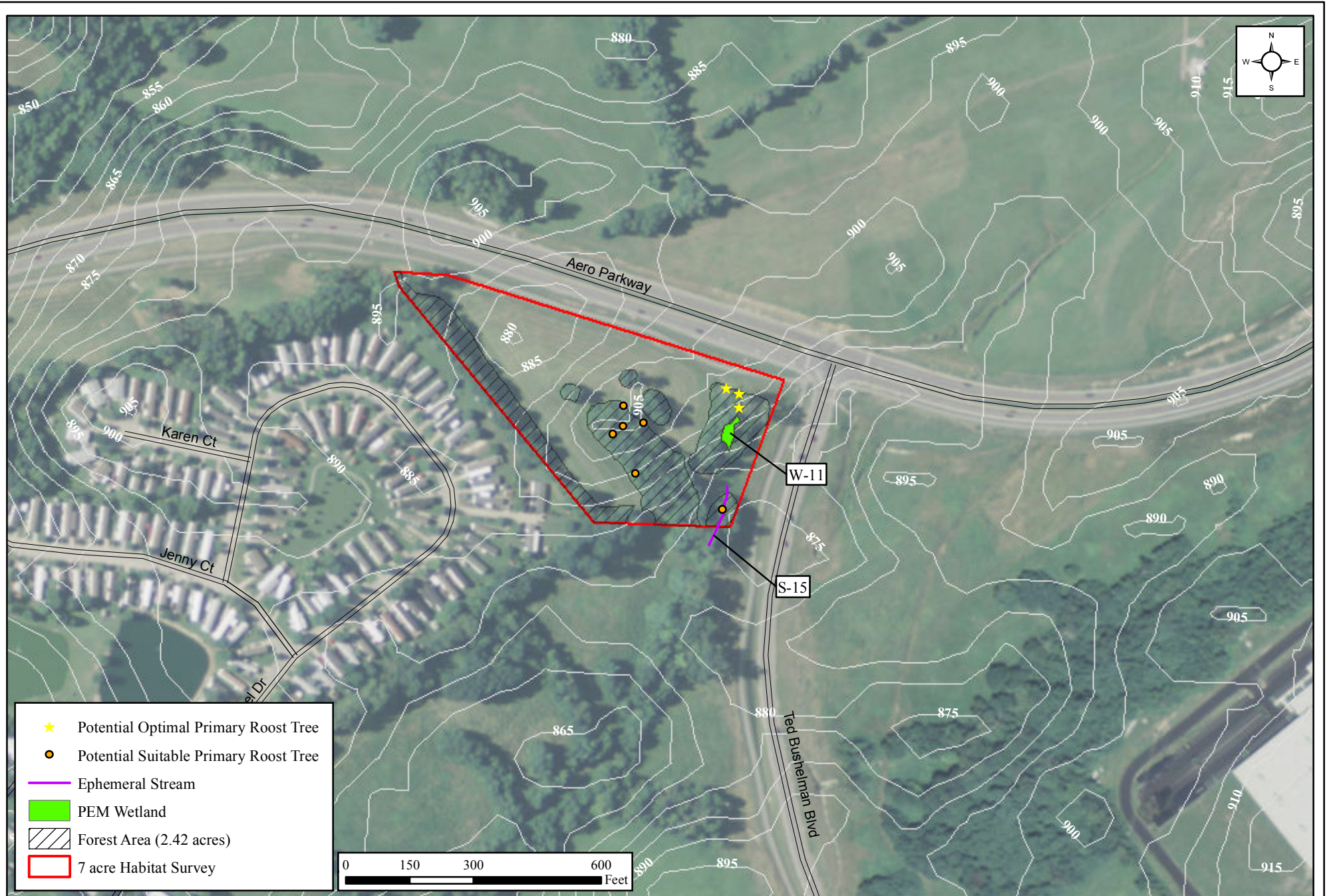


Figure 2	Kenton County Airport Board Cincinnati/Northern Kentucky International Airport Ted Bushelman Boulevard Development Site 6CW-1 - 7 acre Habitat Survey Boone County, Kentucky	Aerial Map Aerial provided by ESRI Map Services 1:3,600 <i>Environment & Archaeology</i> <small>LLC</small>
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Enclosure 2
Habitat Photographs





											
Photo:	1	Direction:	E	Date:	9/26/2016	Photo:	2	Direction:	N	Date:	9/26/2016
Comments: Overview of the survey area looking eastward from the western corner of the parcel along the south side of Aero Parkway.						Comments: Overview of the eastern portion of the survey area, paralleling Ted Bushelman Blvd.					
											
Photo:	3	Direction:	WSW	Date:	9/26/2016	Photo:	4	Direction:	WSW	Date:	9/26/2016
Comments: Overview of the survey area facing SSW along the fenceline at the western edge of the parcel.						Comments: Representative overview of mowed old field growth, looking toward the western boundary.					

											
Photo:	5	Direction:	E	Date:	9/26/2016	Photo:	6	Direction:	ESE	Date:	9/26/2016
Comments: Overview of the survey area looking eastward toward the northern parcel boundary						Comments: Overview of the central portion of the parcel facing ESE toward the intersection of Ted Bushelman and Aero Parkway					
											
Photo	7	Direction:	N	Date:	9/26/2016						
Comments: Overview of potential suitable primary Myotis bat roost tree.											

Enclosure 3
Bat Roost Tree Inventory

Table A1 **Identified suitable roost trees present within the Survey Area**

Tree	Species	DBH (inches)	Roost Designation	Alive
1	<i>Acer negundo</i>	9	Suitable Primary	No
2	<i>Fraxinus</i> sp.	16	Optimal Primary	No
3	<i>Fraxinus</i> sp.	16	Optimal Primary	No
4	<i>Fraxinus</i> sp.	16	Optimal Primary	No
5	<i>Acer</i> sp.	9	Suitable Primary	No
6	<i>Prunus serotina</i>	14	Suitable Primary	No
7	<i>Prunus serotina</i>	12	Suitable Primary	No
8	Unknown	9	Suitable Primary	No
9	Unknown	9	Suitable Primary	No

Enclosure 4

**USFWS Information, Planning, and Conservation (IPaC)
Trust Resources Report**

CVG Site 6CW-1

IPaC Trust Resources Report

Generated September 20, 2016 01:19 PM MDT, IPaC v3.0.9

This report is for informational purposes only and should not be used for planning or analyzing project level impacts. For project reviews that require U.S. Fish & Wildlife Service review or concurrence, please return to the IPaC website and request an official species list from the Regulatory Documents page.

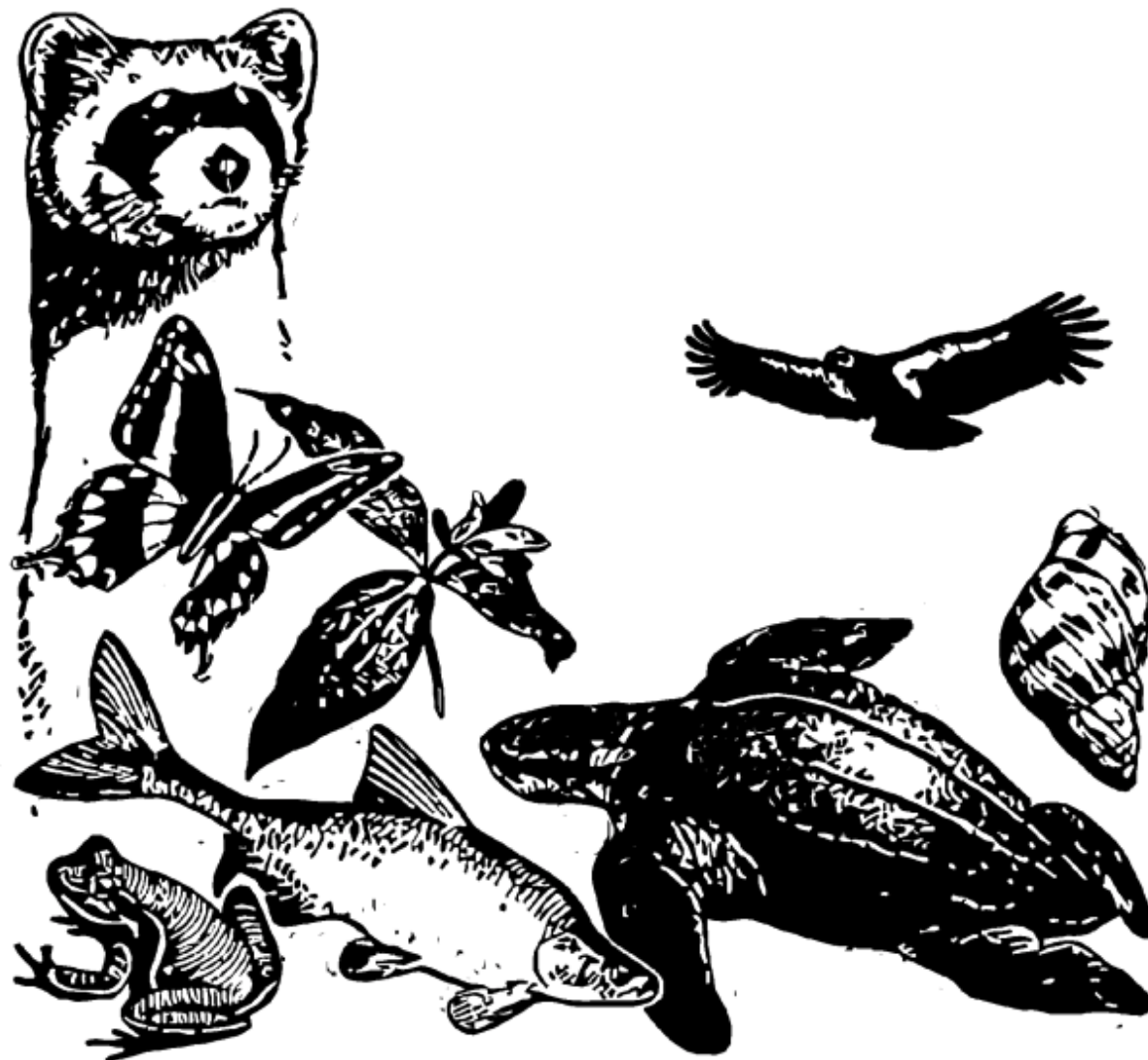


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- IPaC Trust Resources Report [1](#)
- Project Description [1](#)
- Endangered Species [2](#)
- Migratory Birds [5](#)
- Refuges & Hatcheries [7](#)
- Wetlands [8](#)

U.S. Fish & Wildlife Service

IPaC Trust Resources Report



NAME

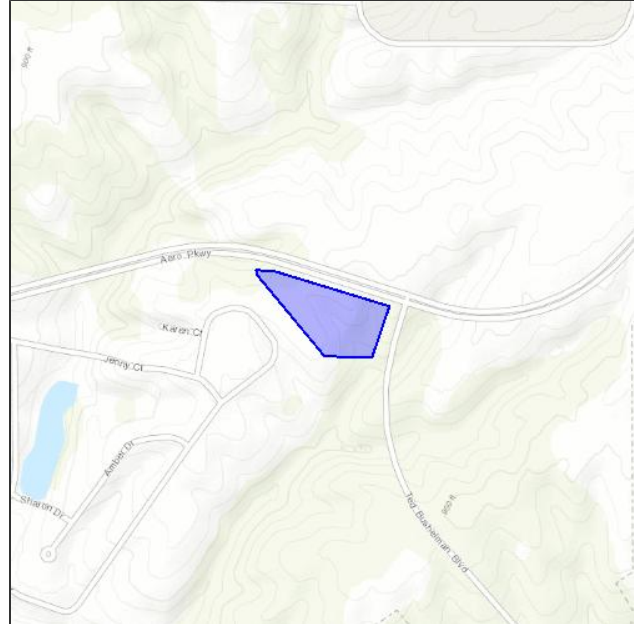
CVG Site 6CW-1

LOCATION

Boone County, Kentucky

IPAC LINK

<https://ecos.fws.gov/ipac/project/VO7EB-MYIGJ-DZBPK-RC5DP-22H6GU>



U.S. Fish & Wildlife Service Contact Information

Trust resources in this location are managed by:

Kentucky Ecological Services Field Office

J C Watts Federal Building, Room 265

330 West Broadway

Frankfort, KY 40601-8670

(502) 695-0468

Endangered Species

Proposed, candidate, threatened, and endangered species are managed by the [Endangered Species Program](#) of the U.S. Fish & Wildlife Service.

This USFWS trust resource report is for informational purposes only and should not be used for planning or analyzing project level impacts.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list from the Regulatory Documents section.

[Section 7](#) of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency.

A letter from the local office and a species list which fulfills this requirement can only be obtained by requesting an official species list either from the Regulatory Documents section in IPaC or from the local field office directly.

The list of species below are those that may occur or could potentially be affected by activities in this location:

Clams

Clubshell *Pleurobema clava* Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=F01D

Fanshell *Cyprogenia stegaria* Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=F02H

Orangefoot Pimpleback (pearlymussel) *Plethobasus cooperianus* Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=F00R

Pink Mucket (pearlymussel) *Lampsilis abrupta* Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=F00G

Ring Pink (mussel) *Obovaria retusa* Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=F00S

Rough Pigtoe *Pleurobema plenum* Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=F00P

Sheepnose Mussel *Plethobasus cyphus* Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=F046

Flowering Plants

Running Buffalo Clover *Trifolium stoloniferum* Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=Q2RE

Mammals

Gray Bat *Myotis grisescens* Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=A04J

Indiana Bat *Myotis sodalis* Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=A000

Northern Long-eared Bat *Myotis septentrionalis* Threatened

THIS SPECIES ONLY NEEDS TO BE CONSIDERED IF THE FOLLOWING CONDITION APPLIES

This project would result in take other than incidental take.

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=A0JE

Critical Habitats

There are no critical habitats in this location

Migratory Birds

Birds are protected by the [Migratory Bird Treaty Act](#) and the [Bald and Golden Eagle Protection Act](#).

Any activity that results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish & Wildlife Service.^[1] There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures.

1. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

Additional information can be found using the following links:

- Birds of Conservation Concern
<http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Conservation measures for birds
<http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Year-round bird occurrence data
<http://www.birdscanada.org/birdmon/default/datasummaries.jsp>

The following species of migratory birds could potentially be affected by activities in this location:

Bald Eagle <i>Haliaeetus leucocephalus</i>	Bird of conservation concern
Season: Year-round http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B008	
Black-billed Cuckoo <i>Coccyzus erythrophthalmus</i>	Bird of conservation concern
Season: Breeding http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0H1	
Blue-winged Warbler <i>Vermivora pinus</i>	Bird of conservation concern
Season: Breeding	
Cerulean Warbler <i>Dendroica cerulea</i>	Bird of conservation concern
Season: Breeding http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B091	
Chuck-will's-widow <i>Caprimulgus carolinensis</i>	Bird of conservation concern
Season: Breeding	

Dickcissel <i>Spiza americana</i> Season: Breeding	Bird of conservation concern
Fox Sparrow <i>Passerella iliaca</i> Season: Wintering	Bird of conservation concern
Henslow's Sparrow <i>Ammodramus henslowii</i> Season: Breeding http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B09D	Bird of conservation concern
Kentucky Warbler <i>Oporornis formosus</i> Season: Breeding	Bird of conservation concern
Least Bittern <i>Ixobrychus exilis</i> Season: Breeding http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B092	
Loggerhead Shrike <i>Lanius ludovicianus</i> Season: Year-round http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0FY	Bird of conservation concern
Peregrine Falcon <i>Falco peregrinus</i> Season: Breeding http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0FU	Bird of conservation concern
Prairie Warbler <i>Dendroica discolor</i> Season: Breeding	Bird of conservation concern
Prothonotary Warbler <i>Protonotaria citrea</i> Season: Breeding	Bird of conservation concern
Red-headed Woodpecker <i>Melanerpes erythrocephalus</i> Season: Year-round	Bird of conservation concern
Rusty Blackbird <i>Euphagus carolinus</i> Season: Wintering	Bird of conservation concern
Sedge Wren <i>Cistothorus platensis</i> Season: Migrating	Bird of conservation concern
Short-eared Owl <i>Asio flammeus</i> Season: Wintering http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0HD	Bird of conservation concern
Willow Flycatcher <i>Empidonax traillii</i> Season: Breeding http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0F6	Bird of conservation concern
Wood Thrush <i>Hylocichla mustelina</i> Season: Breeding	Bird of conservation concern
Worm Eating Warbler <i>Helmitheros vermivorum</i> Season: Breeding	Bird of conservation concern

Wildlife refuges and fish hatcheries

There are no refuges or fish hatcheries in this location

Wetlands in the National Wetlands Inventory

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

DATA LIMITATIONS

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

DATA EXCLUSIONS

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

DATA PRECAUTIONS

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

There are no wetlands in this location

September 23, 2016

United States Fish and Wildlife Service
Attn: Lee Andrews, Field Supervisor
30 West Broadway, Suite 265
Frankfort, Kentucky 40601

Kentucky Department of Fish and Wildlife Resources
Attn: Jason Ping
#1 Sportsman's Lane
Frankfort, Kentucky 40601

Re: Section 7 Threatened and Endangered Species Consultation
CVG Site 6BW
Ted Bushelman Boulevard Development
Cincinnati/Northern Kentucky International Airport in Boone County, Kentucky

Dear Mr. Andrews and Mr. Ping:

The Kenton County Airport Board (KCAB) is proposing new development activities at property within the Cincinnati/Northern Kentucky International Airport (CVG). The new development is referred to as the Site 6BW Project (Project). The Project will require federal authorization from the U.S. Army Corps of Engineers in the form of Nationwide Permit 39. As such, Section 7 consultation is required. *Environment & Archaeology, LLC* submits this consultation on behalf of Kenton County Airport Board (KCAB) and we provide to you the Project information below and attached so that you can provide a determination of effect/no effect.

1.0 PROJECT DESCRIPTION

The KCAB is proposing land development that would involve the following components:

1. Site preparation, measuring approximately 7 acres in size, located at the northwest corner of Ted Bushelman Boulevard and Doering Drive.
2. Construction and operation of a 98,000 square-foot commercial building with two retail spaces.
3. Parking and circulation areas to support operations for the building.
4. Grading activities to manage stormwater flow.

The site is shown on the Burlington USGS 7.5-minute topographic quadrangle map (Figure 1). The KCAB retained *Environment & Archaeology, LLC* to perform a field survey of the Project Area, totaling approximately seven (7) acres on August 21 and 22, September 8, 2014 and February 19, 2016 (Figure 1). The land use within the Project Area was classified as urban/industrial, as it is currently undeveloped airport property.

The Project Area occurs within the watershed of Gunpowder Creek (HUC 12: 05090203) of the Ohio River basin within Boone County, Kentucky. A formal wetland and stream delineation identified one (1) ephemeral stream within the Project Area. Table 1 itemizes the surface waters within the project area and Figure 2 provides the location of the forested areas and other natural areas. Development activities will require 1.80 acres of tree clearing. A photolog providing representative photographs of the Project Area is provided with this letter.

Table 1 Waterbody Summary Table in Proposed Project Area

Waterbody#	Waterbody Type ¹	RBP Score ²	Provisional Hydrologic Status	Stream Bank Width (ft)	Water Depth (in)	Linear Footage	Acreage
Streams							
S-6	Ephemeral	93	Connected	3 to 4.5	1 to 4	722	0.06
			Streams		Ephemeral		
						722	0.06 acre
Waterbodies Total						722	0.06 acre

2.0 THREATENED AND ENDANGERED SPECIES IN BOONE COUNTY, KENTUCKY

A review of the U.S. Fish and Wildlife Service’s Information, Planning, and Conservation System (IPAC) and county list determined that ten (10) threatened, endangered or proposed endangered species have ranges within the proposed Project area. The species have been identified below in Table 2 and the IPAC has been included as an attachment.

Table 2 Threatened/Endangered Species Known to Have Ranges in Proposed Project Area

Common Name	Scientific Name	Status
Mammals		
Gray Bat	<i>Myotis grisescens</i>	Endangered
Indiana Bat	<i>Myotis sodalis</i>	Endangered
Northern Long-Eared Bat	<i>Myotis septentrionalis</i>	Threatened
Mussels		
Clubshell	<i>Pleurobema clava</i>	Endangered
Pink Mucket	<i>Lampsilis abrupta</i>	Endangered
Orangefoot pimpleback	<i>Plethobasus cooperianus</i>	Endangered
Sheepnose	<i>Plethobasus cyphus</i>	Endangered
Rough pigtoe	<i>Pleurobema plenum</i>	Endangered
Fanshell	<i>Cyprogenia stegaria</i>	Endangered
Ring Pink	<i>Obovaria retusa</i>	Endangered
Plants		
Running Buffalo Clover	<i>Trifolium stoloniferum</i>	Endangered

3.0 POTENTIAL THREATENED/ENDANGERED SPECIES HABITAT IN PROJECT

Gray Bat

Gray bats inhabit caves year-round. In the winter, the gray bat hibernates in deep vertical caves. In the summer, they roost in caves scattered along rivers. There was no karst topography within the Project Area and no caves were identified within or adjacent to the Project Area during habitat survey on February 19, 2016. Therefore, the proposed Project does not contain the required habitat for the gray bat.

Indiana Bat/Northern Long-Eared Bat

The USFWS Kentucky Field Office (KFO) has developed the Conservation Strategy for Forest-Dwelling Bats in the Commonwealth of Kentucky. The project area is not located within known habitat for any of the Myotid species; the project area does occur within potential habitat of each of the species. Suitable habitat for the Indiana and northern long-eared bats includes roosting and foraging habitat, travel corridors, and hibernacula. Hibernacula, winter habitat, includes caves and, to a lesser extent, abandoned mines where the ambient temperature remains below 50°F but rarely drops below freezing.

The KFO uses the follow definitions for roost trees:

- “Suitable Indiana bat primary maternity roost tree” refers to a dead or partially dead tree that is at least 9 inches in diameter at breast height (DBH) and has cracks, crevices, and/or loose or exfoliating bark.
- “Optimal Indiana bat primary maternity roost tree” refers to trees with the characteristics above that are in excess of 16 inches DBH.
- “Suitable roost tree” refers to a tree (live or dead) that exhibits any of the following characteristics: exfoliating bark, crevices or cracks. Indiana and/or northern long-eared bats typically roost under exfoliating bark, in cavities of dead, dying, and live trees, and in snags (i.e., dead trees or dead portions of live trees). For Indiana bats, suitable roost trees will have a DBH of 5 inches or greater; for northern long-eared bats, the minimum DBH is 3 inches and includes trees with cavities in addition to the above-mentioned characteristics attributable to Indiana bat roosts.

Summer habitat refers to suitable summer habitat used by any Indiana bat or northern long-eared bat, regardless of reproductive condition. For northern long-eared bat, known summer habitat occurs within 3 miles of a capture location or 1.5 miles of a documented roost tree. Maternity roost trees are typically within canopy gaps in a forest, in a fence-line, and along the edges of wooded areas, frequently associated with streams, floodplain, forests, forested wetlands, and impounded water bodies. Travel corridors are areas that link roosting and foraging habitat, including open-understory forest, wooded fence-rows, and open paths through wooded areas, including streams, trails, and small roads with canopy cover. There were no caves or abandoned mines identified within the project area. The field survey identified 4 trees in the project area possessing characteristics of a suitable, suitable primary, or optimal primary tree.

The Project Area is located outside of known forest-dwelling bat habitat; the area is designated as Potential Habitat by the USFWS, Kentucky Field Office (KFO). Impacts to potential habitat requires mitigation per guidelines of the KFO *Conservation Strategy for Forest-Dwelling Bats*. The current rate for mitigation is \$3,250.00/acre if the habitat is removed between April 1 and October 14th, or half of said amount (\$1,625.00) if between October 15th and March 31st. At this time, the Conservation Strategy does not cover tree removal in June or July.

Project plans will require tree removal in April 2017 and the project proponent will commit to the required payment into the Imperiled Bat Conservation Fund (IBCF) sufficient to meet the required mitigation needs. Tree removal will total 1.80 acres. The total mitigation payment will be \$5,850.00 (\$3,250.00/acre x 1.80 acres). A list of the trees identified to be suitable roost trees is attached. The table outlines the species, alive/dead status, DBH, and roost tree designation.

Mussels

According to the USFWS IPaC and county list, there are seven mussel species (clubshell, pink mucket, orangefoot pimpleback, sheepnose, rough pigtoe, fanshell, and ring pink) with the potential to be located within the proposed project area. A review of the required habitat for each of the mussel species and threat status via NatureServe was performed (<http://explorer.natureserve.org/servlet/NatureServe?init=Species>). The seven mussel species require medium to large streams/rivers with, in general, gravel/sand/cobble substrates and fast-flowing water. One of the threats to all of the seven listed mussel species are impoundments.

The Project Area contains only one ephemeral channel that lacks morphology, flow regime and substrate necessary to support the listed mussel species. The stream channel had stagnant water and a silt/clay substrate. Therefore, the proposed Project does not contain the required habitat for any of the mussel species and will not affect the protected mussel species.

Running Buffalo Clover

Suitable habitat for the running buffalo clover generally is mesic woodlands in partial to filtered sunlight, where there is a pattern of moderate periodic disturbance for a prolonged period, such as mowing, trampling, or grazing. It is most often found in regions underlain with limestone or other calcareous bedrock, but not exclusively. It has been reported from a variety of disturbed woodland habitats, including blue-ash savannahs, floodplains, streambanks, shoals (especially where old trails cross or parallel intermittent streams), grazed woodlots, mowed paths (e.g. cemeteries and lawns), old logging roads, jeep trails, skidder trails, mowed wildlife openings within mature forests, and steep, weedy ravines.

The proposed Project contains mostly area with full sun that has been disturbed. There is an areas of partial to filtered sunlight, located along the stream edge. While the field survey was not performed during the flowering period of the running buffalo clover, no species were identified. Laura Kangas, a USFWS Qualified Running Buffalo Clover Surveyor, performed the field survey on February 19, 2016. Based on the existing site conditions, the Project activities are not anticipated to affect running buffalo clover.

4.0 MIGRATORY BIRDS OF CONSERVATION CONCERN

A review of the U.S. Fish and Wildlife Service’s Information, Planning, and Conservation System (IPAC) list determined that 21 species have ranges within the proposed Project area. The species have been identified below in Table 3 and the IPaC has been included as an attachment.

Based on the mobility of the avian species listed within Table 3, we conclude that the proposed Project is not likely to have an adverse effect on the Migratory Birds of Conservation Concern Listed to Have Ranges in the Proposed Project.

5.0 PROPOSED IMPACTS

The proposed CVG Site 6BW Project will require approximately 7 acres of land disturbance for development activities. Forest cover and surface waters will be affected; development activities will occur within and up to approximately 722 feet of ephemeral stream and will require the clearing of up to 1.80 acres of upland deciduous forest.

Table 3 Migratory Birds of Conservation Concern Listed to Have Ranges in Proposed Project Area

Common Name	Scientific Name	Seasonal Occurrence in Project Area	Potential for Project to Impact Species
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Year-Round	No habitat found; nearest large body of water (Ohio River) is 4 miles north of Project area.
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	Breeding	No impacts anticipated due to mobility of species and available surrounding habitat
Blue-winged Warbler	<i>Vermivora pinus</i>	Breeding	
Cerulean Warbler	<i>Dendroica cerulean</i>	Breeding	
Chuck-will’s-widow	<i>Caprimulgus carolinensis</i>	Breeding	
Dickcissel	<i>Spiza Americana</i>	Breeding	
Fox Sparrow	<i>Passerella iliaca</i>	Wintering	
Henslow’s Sparrow	<i>Ammodramus henslowii</i>	Breeding	
Kentucky Warbler	<i>Oporornis formosus</i>	Breeding	
Least Bittern	<i>Ixobrychus exilis</i>	Breeding	
Loggerhead Shrike	<i>Lanius ludovicianus</i>	Year- Round	
Peregrine Falcon	<i>Falco peregrinus</i>	Breeding	
Prairie Warbler	<i>Dendroica discolor</i>	Breeding	
Prothonotary Warbler	<i>Protonotaria citrea</i>	Breeding	
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	Year-Round	
Rusty Blackbird	<i>Euphagus carolinus</i>	Wintering	
Sedge Wren	<i>Cistothorus platensis</i>	Migrating	
Short-Eared Owl	<i>Asio flammeus</i>	Wintering	
Willow Flycatcher	<i>Empidonax traillii</i>	Breeding	
Wood Thrush	<i>Hylocichla mustelina</i>	Breeding	
Worm Eating Warbler	<i>Helmitheros vermivorum</i>	Breeding	

6.0 IMPACT MINIMIZATION SUMMARY

KCAB has designed the proposed Project to minimize waterbody impacts and the amount of forest clearing required to the least amount practical. Tree removal activities will total 1.80 acres.

7.0 SUMMARY

The proposed CVG Site 6BW Project Area encompassed a 7-acre area. The parcel contained approximately 722 feet of ephemeral stream. Anticipated development activities within the 7-acre parcel will include construction and operations of a 98,000 square foot commercial structure with two retail locations, construction of parking and circulation areas to support operations for the building, and grading of land to manage stormwater flow.

The Project is not anticipated to adversely affect any listed species due to a combination of lack of habit, species mobility, and mitigation measures. Suitable stream habitat is lacking for the mussel species; site conditions do not support habitat for running buffalo clover and no individuals were identified. Based on the mobility of the avian species listed within Table 3, we conclude that the proposed Project is not likely to have an adverse effect on the Migratory Birds of Conservation Concern Listed to Have Ranges in the Proposed Project area. The necessary tree removal will occur during the month of April 2017 and the Project proponent will commit to the required \$5,850.00 payment into the Imperiled Bat Conservation Fund (IBCF) sufficient to meet the required mitigation regarding the Indiana bat and Northern long-eared bat.

At your earliest convenience, please provide your concurrence that this Project will not result in any adverse effects on federally protected species. Should you have any questions, please do not hesitate to contact me at 865-560-1601. Also, please feel free to contact Debbie Conrad of KCAB at 859-767-7021. We appreciate your timely review of this request.

Sincerely,



Jenny Sunday
Project Manager

Enclosures (4):

- 1- Figure 1 – USGS Topographic Map, Aerial Imagery Map
- 2- Habitat Photographs
- 3- Bat Roost Tree Inventory
- 4- USFWS Information, Planning, and Conservation System (IPaC) Summary
- 5- Construction Drawing

Cc: Sarah Potter, Landrum & Brown
Debbie Conrad, KCAB

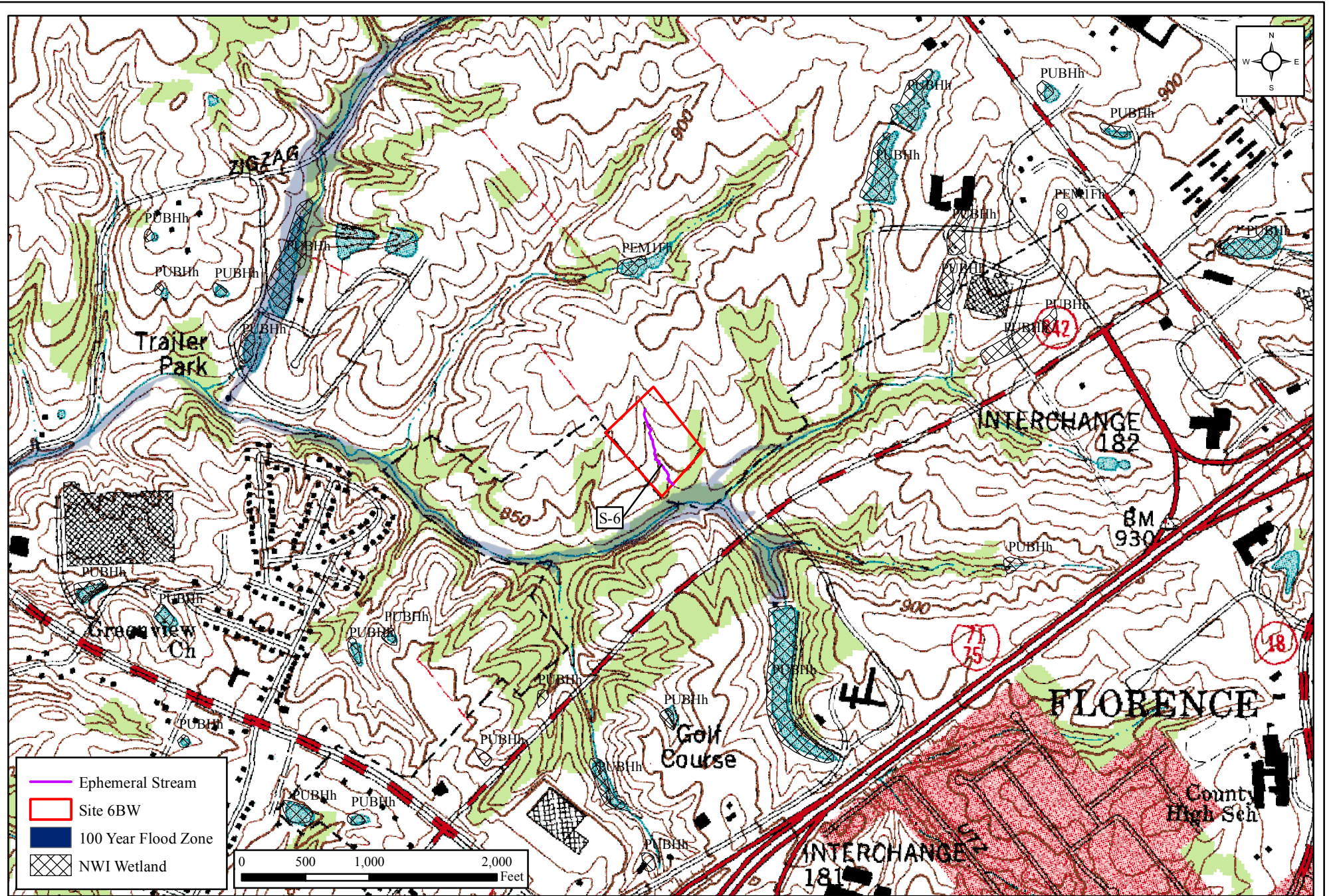


Figure 1
 Kenton County Airport Board
 Cincinnati/Northern Kentucky International Airport
 Ted Bushelman Boulevard Development
 Site 6BW
 Boone County, Kentucky

USGS 7.5' Topographic Map
 Burlington, KY Quadrangle
 1:12,000
 Environment & Archaeology
 LLC

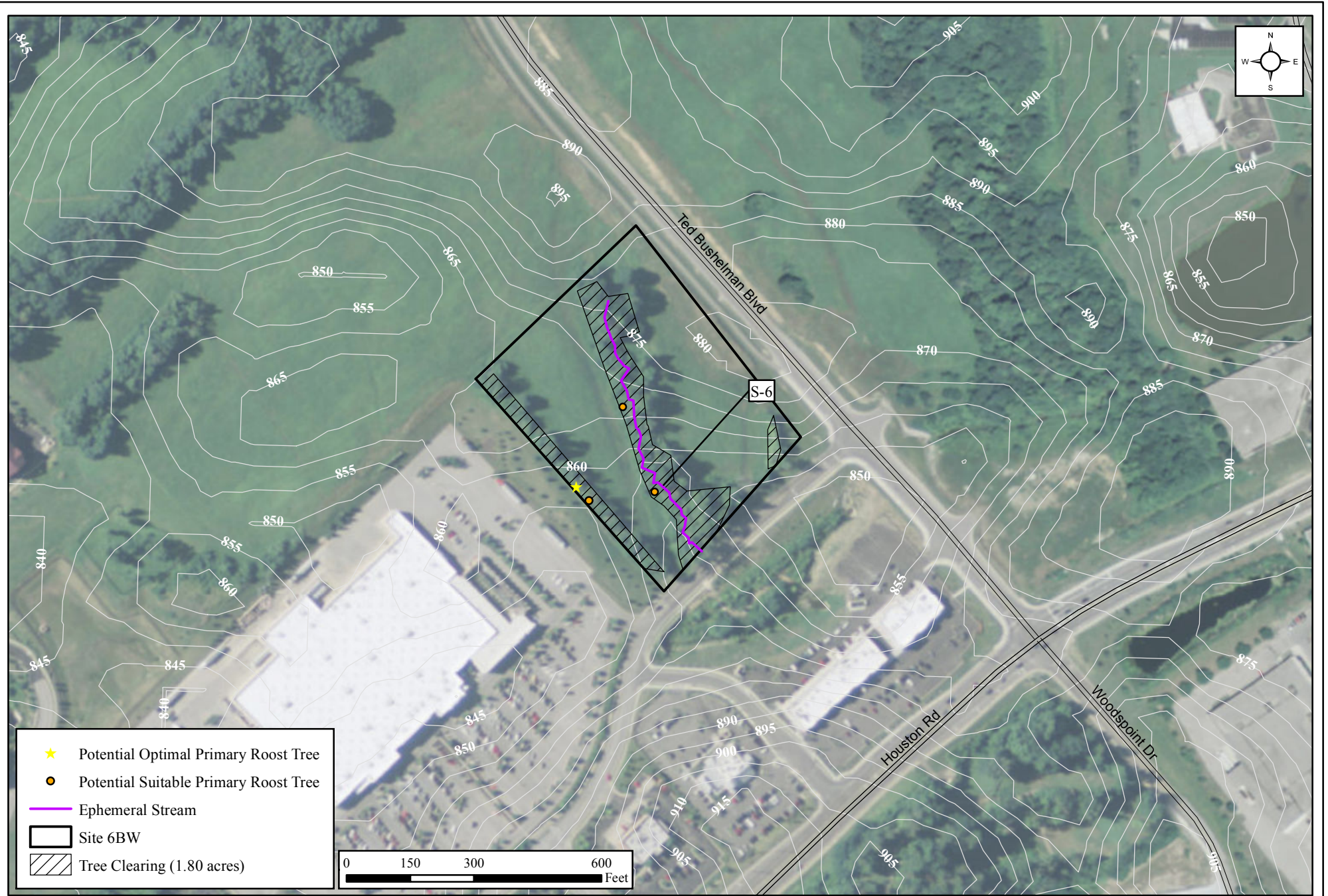


Figure 2

Kenton County Airport Board
 Cincinnati/Northern Kentucky International Airport
 Ted Bushelman Boulevard Development
 Site 6BW
 Boone County, Kentucky

Aerial Map
 Aerial provided by ESRI Map Services
 1:3,600
 Environment & Archaeology
 LLC





											
Photo:	1	Direction:	E	Date:	2/19/2016	Photo:	2	Direction:	NNW	Date:	2/19/2016
Comments: Representative overview of mixed deciduous forest with a relatively disturbed, open understory, as seen within the south-central portion of the survey area.						Comments: Representative overview of narrow segment of mixed deciduous forest with a dense, disturbed understory, bordering old field.					
											
Photo:	3	Direction:	N	Date:	2/19/2016	Photo:	4	Direction:	N	Date:	8/21/2014
Comments: Overview of potential suitable Myotis bat primary maternity roost tree (16-inch diameter dead black cherry).						Comments: Stream-6, upstream view, lower reach					



Photo:	5	Direction:	S	Date:	8/21/2014
Comments: Stream-6, downstream view, lower reach					

Table A1 **Identified suitable roost trees present within the Project Area**

Tree	Species	DBH (inches)	Roost Designation	Alive
1	<i>Prunus serotina</i>	16	Optimal Primary	No
2	<i>Prunus serotina</i>	6	Suitable	Partial
3	<i>Prunus serotina</i>	5	Suitable	No
4	<i>Fraxinus sp.</i>	8	Suitable	No

CVG Site 6BW

IPaC Trust Resources Report

Generated September 20, 2016 01:21 PM MDT, IPaC v3.0.9

This report is for informational purposes only and should not be used for planning or analyzing project level impacts. For project reviews that require U.S. Fish & Wildlife Service review or concurrence, please return to the IPaC website and request an official species list from the Regulatory Documents page.



Table of Contents

- IPaC Trust Resources Report [1](#)
- Project Description [1](#)
- Endangered Species [2](#)
- Migratory Birds [5](#)
- Refuges & Hatcheries [7](#)
- Wetlands [8](#)

U.S. Fish & Wildlife Service

IPaC Trust Resources Report



NAME

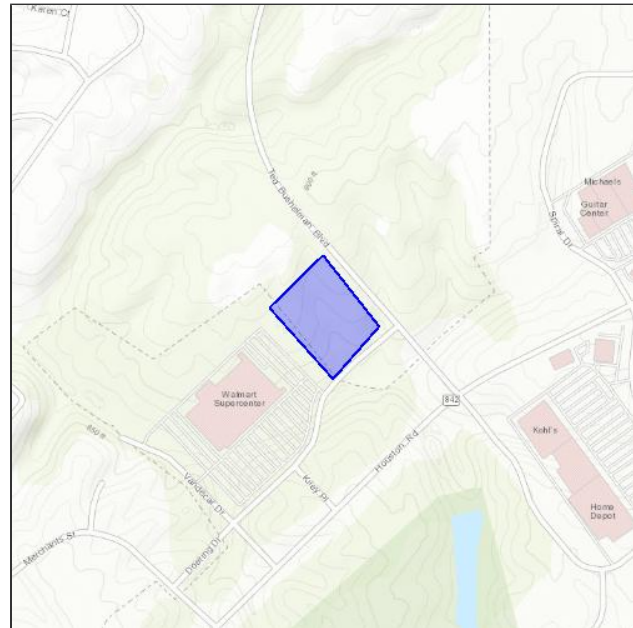
CVG Site 6BW

LOCATION

Boone County, Kentucky

IPAC LINK

<https://ecos.fws.gov/ipac/project/454LQ-FK23F-BCZKE-MCBCB-VEQCRY>



U.S. Fish & Wildlife Service Contact Information

Trust resources in this location are managed by:

Kentucky Ecological Services Field Office

J C Watts Federal Building, Room 265

330 West Broadway

Frankfort, KY 40601-8670

(502) 695-0468

Endangered Species

Proposed, candidate, threatened, and endangered species are managed by the [Endangered Species Program](#) of the U.S. Fish & Wildlife Service.

This USFWS trust resource report is for informational purposes only and should not be used for planning or analyzing project level impacts.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list from the Regulatory Documents section.

[Section 7](#) of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency.

A letter from the local office and a species list which fulfills this requirement can only be obtained by requesting an official species list either from the Regulatory Documents section in IPaC or from the local field office directly.

The list of species below are those that may occur or could potentially be affected by activities in this location:

Clams

Clubshell *Pleurobema clava* Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=F01D

Fanshell *Cyprogenia stegaria* Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=F02H

Orangefoot Pimpleback (pearlymussel) *Plethobasus cooperianus* Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=F00R

Pink Mucket (pearlymussel) *Lampsilis abrupta* Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=F00G

Ring Pink (mussel) *Obovaria retusa* Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=F00S

Rough Pigtoe *Pleurobema plenum* Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=F00P

Sheepnose Mussel *Plethobasus cyphus* Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=F046

Flowering Plants

Running Buffalo Clover *Trifolium stoloniferum* Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=Q2RE

Mammals

Gray Bat *Myotis grisescens*

Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=A04J

Indiana Bat *Myotis sodalis*

Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=A000

Northern Long-eared Bat *Myotis septentrionalis*

Threatened

THIS SPECIES ONLY NEEDS TO BE CONSIDERED IF THE FOLLOWING CONDITION APPLIES

This project would result in take other than incidental take.

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=A0JE

Critical Habitats

There are no critical habitats in this location

Migratory Birds

Birds are protected by the [Migratory Bird Treaty Act](#) and the [Bald and Golden Eagle Protection Act](#).

Any activity that results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish & Wildlife Service.^[1] There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures.

1. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

Additional information can be found using the following links:

- Birds of Conservation Concern
<http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Conservation measures for birds
<http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Year-round bird occurrence data
<http://www.birdscanada.org/birdmon/default/datasummaries.jsp>

The following species of migratory birds could potentially be affected by activities in this location:

Bald Eagle <i>Haliaeetus leucocephalus</i>	Bird of conservation concern
Season: Year-round http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B008	
Black-billed Cuckoo <i>Coccyzus erythrophthalmus</i>	Bird of conservation concern
Season: Breeding http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0H1	
Blue-winged Warbler <i>Vermivora pinus</i>	Bird of conservation concern
Season: Breeding	
Cerulean Warbler <i>Dendroica cerulea</i>	Bird of conservation concern
Season: Breeding http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B091	
Chuck-will's-widow <i>Caprimulgus carolinensis</i>	Bird of conservation concern
Season: Breeding	

Dickcissel <i>Spiza americana</i> Season: Breeding	Bird of conservation concern
Fox Sparrow <i>Passerella iliaca</i> Season: Wintering	Bird of conservation concern
Henslow's Sparrow <i>Ammodramus henslowii</i> Season: Breeding http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B09D	Bird of conservation concern
Kentucky Warbler <i>Oporornis formosus</i> Season: Breeding	Bird of conservation concern
Least Bittern <i>Ixobrychus exilis</i> Season: Breeding http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B092	
Loggerhead Shrike <i>Lanius ludovicianus</i> Season: Year-round http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0FY	Bird of conservation concern
Peregrine Falcon <i>Falco peregrinus</i> Season: Breeding http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0FU	Bird of conservation concern
Prairie Warbler <i>Dendroica discolor</i> Season: Breeding	Bird of conservation concern
Prothonotary Warbler <i>Protonotaria citrea</i> Season: Breeding	Bird of conservation concern
Red-headed Woodpecker <i>Melanerpes erythrocephalus</i> Season: Year-round	Bird of conservation concern
Rusty Blackbird <i>Euphagus carolinus</i> Season: Wintering	Bird of conservation concern
Sedge Wren <i>Cistothorus platensis</i> Season: Migrating	Bird of conservation concern
Short-eared Owl <i>Asio flammeus</i> Season: Wintering http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0HD	Bird of conservation concern
Willow Flycatcher <i>Empidonax traillii</i> Season: Breeding http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0F6	Bird of conservation concern
Wood Thrush <i>Hylocichla mustelina</i> Season: Breeding	Bird of conservation concern
Worm Eating Warbler <i>Helmitheros vermivorum</i> Season: Breeding	Bird of conservation concern

Wildlife refuges and fish hatcheries

There are no refuges or fish hatcheries in this location

Wetlands in the National Wetlands Inventory

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

DATA LIMITATIONS

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

DATA EXCLUSIONS

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

DATA PRECAUTIONS

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

There are no wetlands in this location

Subject: FW: CVG site 6BW bat mitigation

From: Miller, Jessica [mailto:jessica_miller@fws.gov]

Sent: Wednesday, October 19, 2016 8:10 AM

To: jsunday@environment-archaeology.com

Subject: CVG site 6BW bat mitigation

The Kentucky Field Office (KFO) received your request to mitigate for forest-dwelling bat habitat. Fish and Wildlife Service policy for signing Memoranda of Agreement (MOAs) and Memoranda of Understanding (MOUs) has been under review for over a year and was recently completed. As a result of that review, the KFO and the Southeast Regional Office are temporarily unable to sign CMOAs while we seek legal review of them relative to the new MOA/MOU policies. We anticipate the issue to be temporary, but we do not know exactly when it will be remedied. In the interim, we have discussed alternative solutions with our Regional Office for helping you achieve Endangered Species Act (ESA) compliance on projects involving listed forest-dwelling bats in Kentucky (i.e., the Indiana bat and northern long-eared bat). The Interim Compliance Process outlined below would help ensure that your project is handled promptly and that you achieve ESA compliance on your project.

Interim Compliance Process for Projects Requesting a Forest-Dwelling Bat CMOA

The KFO's 2015 Conservation Strategy for Forest-Dwelling Bats (Conservation Strategy) identifies the types of conservation measures that are appropriate when impacts to known or potential habitat for listed forest-dwelling bats are unavoidable. One of those measures is a voluntary contribution to the Imperiled Bat Conservation Fund (IBCF) to off-set forest losses that occur as a result of project implementation. Under the Interim Compliance Process you may still make that contribution according to the process described in the Conservation Strategy. If you no longer want to make an IBCF contribution or if you do not want to use the Interim Compliance Process, you continue to have all other compliance options available to you, as outlined in the Conservation Strategy.

According to your September 29, 2016 correspondence, the proposed project would involve the removal of **1.80 acres** of "potential" Indiana bat habitat and "potential" northern long-eared bat habitat anytime of the year, except for June and July. Using the process on pages 20-21 of the Conservation Strategy, the amount of the IBCF contribution would be **\$6,030**.

If you choose to make a contribution to the IBCF, you should use the same basic procedures as we normally used with the CMOA process. To do this, you should complete the following steps:

1. Mail your IBCF contribution to: Kentucky Natural Lands Trust
c/o Hugh Archer, Executive Director
433 Chestnut Street
Berea, KY 40403

Your contribution should be made via check or money order made payable to Kentucky Natural Lands Trust.

2. You should send a cover letter or memo with your contribution, referencing the Project Proponent's Name, the KFO Project Number (**2017-B-0009**), and "IBCF Contribution" in the letter or memo or on the check or money order. Additionally, a contact name and address should be included in the letter or memo so that a letter of receipt can be sent.

When we receive notification from the Kentucky Natural Land Trust that your contribution has been received, the KFO will acknowledge the contribution and provide you or the federal action agency a letter explaining that:

a) We have analyzed the effects of your action already under the 2015 Biological Opinion: Kentucky Field Office's Participation in Conservation Memoranda of Agreement for the Indiana Bat and/or Northern Long-eared Bat (BO), your project adheres to the Conservation Strategy and the conservation measures associated with the Conservation Strategy and BO, and the project is not likely to jeopardize the continued existence of the Indiana bat or result in the destruction or adverse modification of designated critical habitat for the species;

b) Any incidental take of Indiana bats that will or could result from the forest habitat removal associated with your project would be authorized under the BO; and

c) The letter from the KFO to you would serve as your documentation that the project is in compliance with the Endangered Species Act for the Indiana bat and the northern long-eared bat and would also apply to any involved federal agency action(s), such as any required federal permits or federal funding.

This letter may also contain additional technical assistance and any concurrences or non-concurrences for other federally listed or proposed species or designated critical habitats that may also be affected by your proposed project. On previous projects that were covered by CMOAs, we typically included this information in a cover letter associated with the CMOA, so the Interim Compliance Process is similar to the CMOA process you may have used before. As a result, the only difference between the CMOA process we normally use and the Interim Compliance Process is that there will not be a CMOA signed by both parties.

Please contact me if you have any questions about the Interim Compliance Process. As always, we are available to provide you with any assistance you may need on your proposed project and can answer any questions that action agencies may have regarding the status of the project's ESA compliance.

--

Jessica Blackwood Miller
Fish & Wildlife Biologist
Kentucky Field Office
U.S. Fish & Wildlife Service
330 W. Broadway, Rm 265
Frankfort, KY 40601
Ph: (502) 695-0468 ext. 104
Fax: (502) 695-1024

NOTE: This email correspondence and any attachments to and from this sender is subject to the Freedom of Information Act (FOIA) and may be disclosed to third parties.

October 11, 2016

Mr. David Baldrige
U.S. Army Corps of Engineers
Louisville District
600 Dr. M. L. King Jr. Place
Louisville, KY 40202

Re: Waiver Request and Nationwide Permit 39 Determination

Proposed CVG Site 6BW
Ted Bushelman Boulevard Development
Cincinnati/Northern Kentucky International Airport (CVG), Boone County, Kentucky

Dear Mr. Baldrige:

On behalf of the Kenton County Airport Board (KCAB), *Environment & Archaeology, LLC* has prepared the attached Nationwide Permit (NWP) 39 - Commercial and Industrial Development pre-construction notification (PCN) pertaining to proposed new development activities at a property within the Cincinnati/Northern Kentucky International Airport (CVG). With this notification, KCAB requests from the Louisville District the granting of a waiver and authorization to utilize NWP 39 for the proposed impact to one ephemeral stream channel (S-6).

The new development is referred to as the Site 6BW Project (Project). Please refer to the enclosed preliminary project footprint as illustrated on the topographic map excerpt and design map. The project parcel is bordered to the east by Ted Bushelman Boulevard, to the south by Doering Drive, and to the west by commercial development. The project area occurs in the receiving watershed of Upper Gunpowder Creek (HUC 12: 050902030806) of the Ohio River Basin but does not occur within a mapped FEMA floodzone. A formal wetland and stream delineation was completed on August 21 and 22, September 8, 2014, and February 10, 2016. No wetlands occur within the proposed CVG Site 6BW project parcel. Approximately 722-feet of one stream channel, S-6, occurs within the west/southwest portion of the project footprint.

Project activities will require discharge activities impacting approximately 722 linear feet of ephemeral stream S-6; fill activities will result in up to 0.06 acre of clean fill at this waterbody location. The S-6 stream characteristics consist of a width of three to four and half feet from top-of-bank to top-of-bank. The ephemeral channel flows south into an unnamed tributary to Gunpowder Creek. The specific stream channel possesses a contributing watershed of 0.0003 square miles and an evaluation per the Rapid Bioassessment Protocol (RBP) resulted in a scoring of 93 (poor quality). Representative photos of stream S-6 are enclosed with this letter.

NWP 39 Commercial and Industrial Development authorizes the loss of no more than 300 linear feet of stream bed, unless for intermittent and ephemeral stream beds, the District Engineer waives the 300 linear foot limit. Based upon the small contributing watershed size and poor stream quality, KCAB requests a written determination concluding that the discharge will result in minimal adverse effect and concur with the applicability of NWP 39 authorization and grant a waiver for the proposed ephemeral stream impacts.

KCAB requests your response to the above requests at your earliest convenience. KCAB understands that the activity cannot proceed until the District Engineer issues the waiver for the ephemeral stream impacts and the District office's statement regarding NWP 39 authorization applicability.

This PCN package includes the following:

- Complete Application Form 4345;
- Site Location Maps;
- Site Photographs ;
- Stream Datasheet;
- Construction Drawing;
- Agency correspondence pertaining to federally protected threatened/endangered species and cultural resources; and
- Preliminary JD Form and Aquatic Resource Table.

We provide to you this complete notification package and look forward to your written authorization and waiver issuance so that KCAB may move forward with this project.

Please forward your response at your earliest possible convenience to the attention of:

Debbie Conrad
Kenton County Airport Board
Cincinnati/Northern Kentucky International Airport
P.O. Box 752000
Cincinnati, Ohio 45275
DConrad@cvgairport.com

Along with a copy to myself:

Jenny Sunday
Environment & Archaeology, LLC
221 Main St
Florence, Kentucky 41042
JSunday@environment-archaeology.com

October 11, 2016
Regulatory Branch, Louisville District

If you have any questions, please contact me at (865) 560-1601 or Debbie Conrad of CVG at (859) 767-7021.

Sincerely,



Jenny Sunday
Project Manager

Enclosure 1 - Complete Application Form 4345;
Enclosure 2 - Site Location Maps;
Enclosure 3 - Site Photographs;
Enclosure 4 - Stream Datasheet
Enclosure 5 - Construction Drawing
Enclosure 6 – Agency Correspondence (USFWS and Cultural Resources)
Enclosure 7 - Preliminary JD Form and Aquatic Resource Table

cc: Debbie Conrad, KCAB
Sarah Potter, Landrum and Brown

Enclosure 1
USACE Application Form

**U.S. ARMY CORPS OF ENGINEERS
APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT**

33 CFR 325. The proponent agency is CECW-CO-R.

**Form Approved -
OMB No. 0710-0003
Expires: 30-SEPTEMBER-2015**

Public reporting for this collection of information is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of the collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters, Executive Services and Communications Directorate, Information Management Division and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please DO NOT RETURN your form to either of those addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and/or instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETE
--------------------	----------------------	------------------	------------------------------

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME First - Middle - Last - Company - E-mail Address -			8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required) First - Middle - Last - Company - E-mail Address -		
6. APPLICANT'S ADDRESS: Address- City - State - Zip - Country -			9. AGENT'S ADDRESS: Address- City - State - Zip - Country -		
7. APPLICANT'S PHONE NOS. w/AREA CODE a. Residence b. Business c. Fax			10. AGENTS PHONE NOS. w/AREA CODE a. Residence b. Business c. Fax		

STATEMENT OF AUTHORIZATION

11. I hereby authorize, _____ to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

SIGNATURE OF APPLICANT

DATE

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)			
13. NAME OF WATERBODY, IF KNOWN (if applicable)		14. PROJECT STREET ADDRESS (if applicable) Address	
15. LOCATION OF PROJECT Latitude: °N Longitude: °W		City -	State- Zip-
16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions) State Tax Parcel ID Municipality Section - Township - Range -			

17. DIRECTIONS TO THE SITE

18. Nature of Activity (Description of project, include all features)

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

Type	Type	Type
Amount in Cubic Yards	Amount in Cubic Yards	Amount in Cubic Yards

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Acres
or
Linear Feet

23. Description of Avoidance, Minimization, and Compensation (see instructions)

24. Is Any Portion of the Work Already Complete? Yes No IF YES, DESCRIBE THE COMPLETED WORK

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list).

a. Address-

City - State - Zip -

b. Address-

City - State - Zip -

c. Address-

City - State - Zip -

d. Address-

City - State - Zip -

e. Address-

City - State - Zip -

26. List of Other Certificates or Approvals/Denials received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED

* Would include but is not restricted to zoning, building, and flood plain permits

27. Application is hereby made for permit or permits to authorize the work described in this application. I certify that this information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

SIGNATURE OF APPLICANT

DATE

SIGNATURE OF AGENT

DATE

The Application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than \$10,000 or imprisoned not more than five years or both.

Enclosure 2
Location Maps –
USGS Topographic Map, Aerial Imagery Map

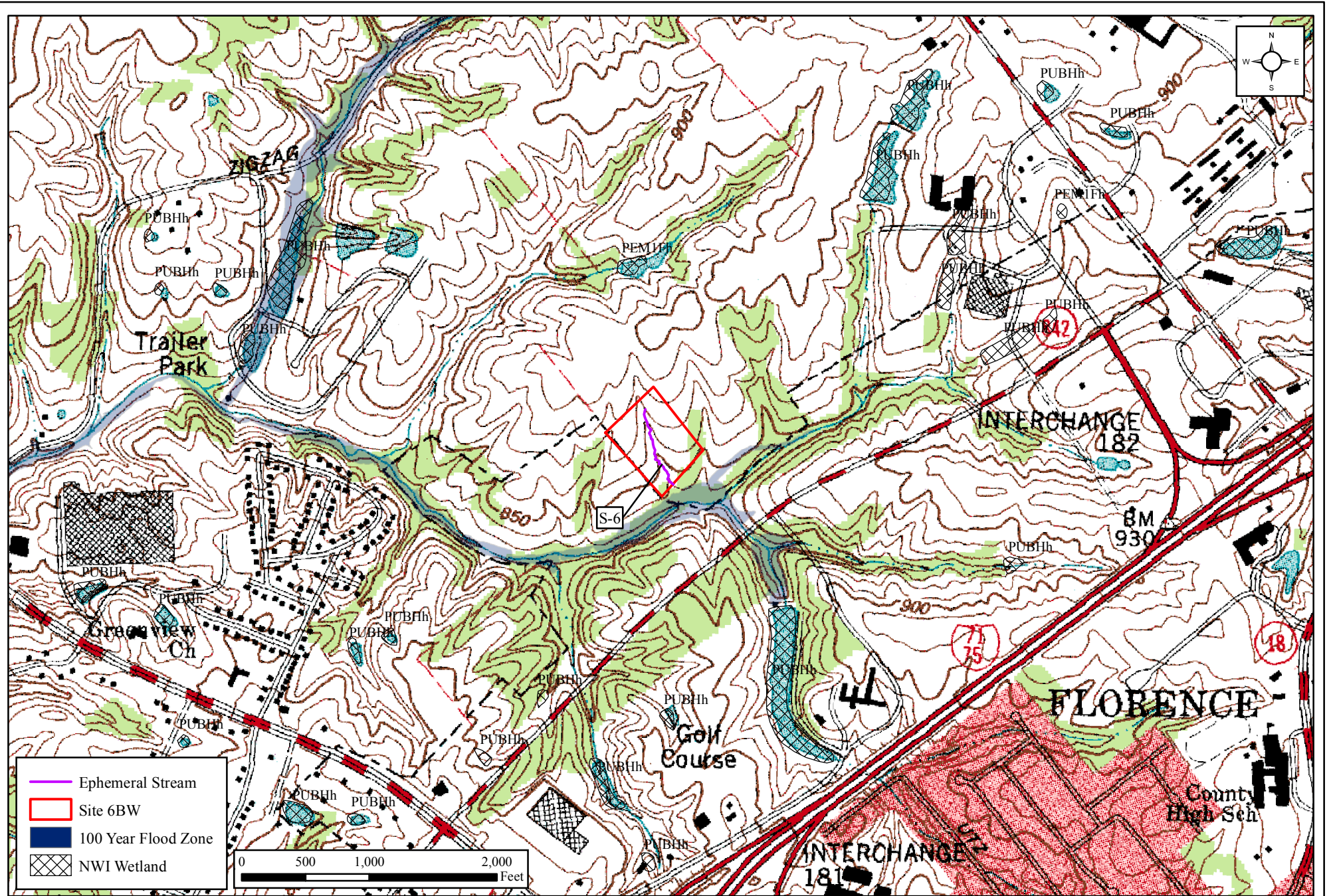


Figure 1

Kenton County Airport Board
 Cincinnati/Northern Kentucky International Airport
 Ted Bushelman Boulevard Development
 Site 6BW
 Boone County, Kentucky

USGS 7.5' Topographic Map
 Burlington, KY Quadrangle
 1:12,000
 Environment & Archaeology
 LLC



Figure 2	Kenton County Airport Board Cincinnati/Northern Kentucky International Airport Ted Bushelman Boulevard Development Site 6BW Boone County, Kentucky	Aerial Map Aerial provided by ESRI Map Services 1:3,600 <i>Environment & Archaeology</i> <small>LLC</small>
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Enclosure 3
Site Photographs





											
Photo:	1	Direction:	N	Date:	8/21/2014	Photo:	2	Direction:	S	Date:	8/21/2014
Comments: Stream-6, upstream view, upper reach						Comments: Stream-6, downstream view, upper reach					
											
Photo:	3	Direction:	N	Date:	8/21/2014	Photo:	4	Direction:	N	Date:	8/21/2014
Comments: Stream-6, Subterranean flow						Comments: Stream-6, upstream view, lower reach					



Photo:	5	Direction:	S	Date:	8/21/2014
Comments: Stream-6, downstream view, lower reach					

Enclosure 4
Stream Datasheet

Appendix A-1 High Gradient Stream Data Sheet

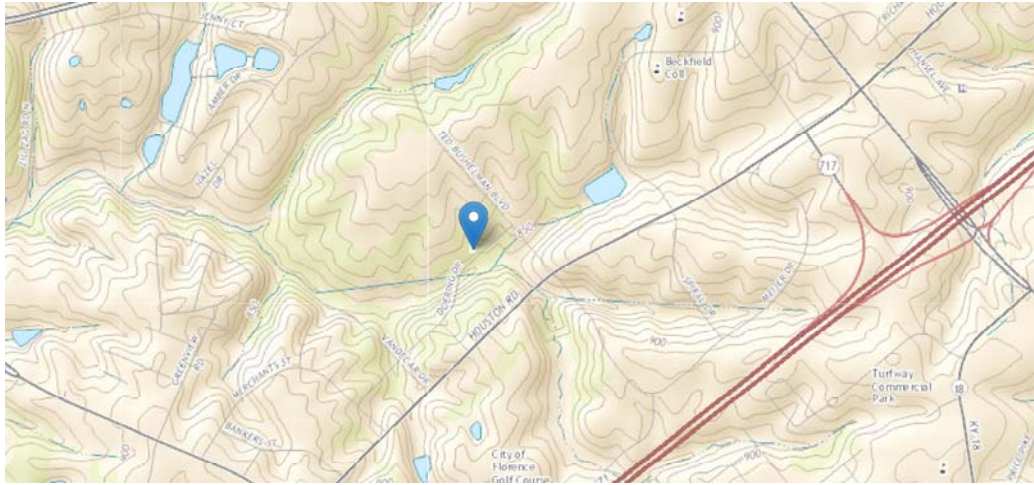
STREAM NAME: <u>Stream 6</u>		LOCATION: <u>Site 6-B</u>		
STATION #: _____ MILE: _____		BASIN/WATERSHED: <u>Middle OHIO - Little Miami</u> <u>05090203</u>		
LAT.: <u>39.01269</u> LONG.: <u>-84.64851</u>		COUNTY: <u>Boone</u> USGS 7.5 TOPO: <u>Burlington</u>		
DATE: <u>8-21-11</u> TIME: <u>9:00</u> <input checked="" type="checkbox"/> AM <input type="checkbox"/> PM		INVESTIGATORS: <u>CT JH</u>		
TYPE SAMPLE: <input type="checkbox"/> P-CHEM <input type="checkbox"/> Macroinvertebrate <input type="checkbox"/> FISH <input type="checkbox"/> BACT.				
WEATHER: Now Past 24 hours <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Has there been a heavy rain in the last 7 days? <input type="checkbox"/> Heavy rain <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Steady rain Air Temperature <u>27</u> °C. Inches rainfall in past 24 hours <u>0.81</u> in. <input type="checkbox"/> Intermittent showers <u>70</u> % Cloud Cover <input checked="" type="checkbox"/> Clear/sunny				
P-Chem: Temp(°C) _____ D.O. (mg/l) _____ %Saturation _____ pH(S.U.) _____ Cond. _____ <input type="checkbox"/> Grab				
INSTREAM WATERSHED FEATURES: Stream Width <u>3-4.5</u> ft Range of Depth <u>1-3</u> ft Average Velocity <u>0</u> ft/s Discharge <u>0</u> cfs Est. Reach Length _____		LOCAL WATERSHED FEATURES: Predominant Surrounding Land Use: <input type="checkbox"/> Surface Mining <input type="checkbox"/> Construction <input checked="" type="checkbox"/> Forest <input type="checkbox"/> Deep Mining <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Pasture/Grazing <input type="checkbox"/> Oil Wells <input type="checkbox"/> Industrial <input type="checkbox"/> Silviculture <input type="checkbox"/> Land Disposal <input type="checkbox"/> Row Crops <input type="checkbox"/> Urban Runoff/Storm Sewers		
Hydraulic Structures: <input type="checkbox"/> Dams <input type="checkbox"/> Bridge Abutments <input type="checkbox"/> Island <input type="checkbox"/> Waterfalls <input type="checkbox"/> Other		Stream Flow: <input checked="" type="checkbox"/> Dry <input type="checkbox"/> Pooled <input type="checkbox"/> Low <input type="checkbox"/> Normal <input type="checkbox"/> High <input type="checkbox"/> Very Rapid or Torrential		
Riparian Vegetation: Dom. Tree/Shrub Taxa Dominate Type: <u>Lo/MoCo</u> <input checked="" type="checkbox"/> Trees <input checked="" type="checkbox"/> Shrubs <u>Elm</u> <input type="checkbox"/> Grasses <input type="checkbox"/> Herbaceous <u>12.5%</u> Number of strata <u>2</u>		Channel Alterations: <input type="checkbox"/> Dredging <input type="checkbox"/> Channelization (<input type="checkbox"/> Full <input type="checkbox"/> Partial)		
Substrate <input type="checkbox"/> Est. <input type="checkbox"/> P.C.		Riffle <u>50</u> % Run <u>20</u> % Pool <u>30</u> %		
Silt/Clay (<0.06 mm)		<u>100%</u>		
Sand (0.06 - 2 mm)		<u>100%</u>		
Gravel (2-64 mm)				
Cobble (64 - 256 mm)				
Boulders (>256 mm)				
Bedrock				
Habitat	Condition Category			
Parameter	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover, mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 <u>4</u> 3 2 1 0
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 <u>4</u> 3 2 1 0
3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Sow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime (usually slow-deep).
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	<u>5</u> 4 3 2 1 0

4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. Note: determine left or right side by facing downstream.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0

Total Score 93 NOTES/COMMENTS:

StreamStats Report - Stream 6 at CVG Site 6BW

Region ID: KY
Workspace ID: KY20160922142756086000
Clicked Point (Latit...) 39.01212, -84.64806
Time: 2016-09-22 16:32:14 -0400



Basin Characteristics			
Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.000258	square miles

Enclosure 5
Construction Drawing

Enclosure 6
Agency Consultation
USFWS/KDFWR
SHPO

September 26, 2016

United States Fish and Wildlife Service
Attn: Lee Andrews, Field Supervisor
330 West Broadway, Suite 265
Frankfort, Kentucky 40601

Kentucky Department of Fish and Wildlife Resources
Attn: Dan Stoelb
#1 Sportsman's Lane
Frankfort, Kentucky 40601

Re: Section 7 Threatened and Endangered Species Consultation
CVG Site 6BW
Ted Bushelman Boulevard Development
Cincinnati/Northern Kentucky International Airport in Boone County, Kentucky

Dear Mr. Andrews and Mr. Stoelb:

The Kenton County Airport Board (KCAB) is proposing new development activities at property within the Cincinnati/Northern Kentucky International Airport (CVG). The new development is referred to as the Site 6BW Project (Project). The Project will require federal authorization from the U.S. Army Corps of Engineers in the form of Nationwide Permit 39. As such, Section 7 consultation is required. *Environment & Archaeology, LLC* submits this consultation on behalf of Kenton County Airport Board (KCAB) and we provide to you the Project information below and attached so that you can provide a determination of effect/no effect.

1.0 PROJECT DESCRIPTION

The KCAB is proposing land development that would involve the following components:

1. Site preparation, measuring approximately 7 acres in size, located at the northwest corner of Ted Bushelman Boulevard and Doering Drive.
2. Construction and operation of a 98,000 square-foot commercial building with two retail spaces.
3. Parking and circulation areas to support operations for the building.
4. Grading activities to manage stormwater flow.

The site is shown on the Burlington USGS 7.5-minute topographic quadrangle map (Figure 1). The KCAB retained *Environment & Archaeology, LLC* to perform a field survey of the Project Area, totaling approximately seven (7) acres on August 21 and 22, September 8, 2014 and February 19, 2016 (Figure 1). The land use within the Project Area was classified as urban/industrial, as it is currently undeveloped airport property.

The Project Area occurs within the watershed of Gunpowder Creek (HUC 12: 05090203) of the Ohio River basin within Boone County, Kentucky. A formal wetland and stream delineation identified one (1) ephemeral stream within the Project Area. Table 1 itemizes the surface waters within the project area and Figure 2 provides the location of the forested areas and other natural areas. Development activities will require 1.80 acres of tree clearing. A photolog providing representative photographs of the Project Area is provided with this letter.

Table 1 Waterbody Summary Table in Proposed Project Area

Waterbody#	Waterbody Type ¹	RBP Score ²	Provisional Hydrologic Status	Stream Bank Width (ft)	Water Depth (in)	Linear Footage	Acreage
Streams							
S-6	Ephemeral	93	Connected	3 to 4.5	1 to 4	722	0.06
		Streams		Ephemeral		722	0.06 acre
		Waterbodies Total				722	0.06 acre

2.0 THREATENED AND ENDANGERED SPECIES IN BOONE COUNTY, KENTUCKY

A review of the U.S. Fish and Wildlife Service’s Information, Planning, and Conservation System (IPAC) and county list determined that ten (10) threatened, endangered or proposed endangered species have ranges within the proposed Project area. The species have been identified below in Table 2 and the IPAC has been included as an attachment.

Table 2 Threatened/Endangered Species Known to Have Ranges in Proposed Project Area

Common Name	Scientific Name	Status
Mammals		
Gray Bat	<i>Myotis grisescens</i>	Endangered
Indiana Bat	<i>Myotis sodalis</i>	Endangered
Northern Long-Eared Bat	<i>Myotis septentrionalis</i>	Threatened
Mussels		
Clubshell	<i>Pleurobema clava</i>	Endangered
Pink Mucket	<i>Lampsilis abrupta</i>	Endangered
Orangefoot pimpleback	<i>Plethobasus cooperianus</i>	Endangered
Sheepnose	<i>Plethobasus cyphus</i>	Endangered
Rough pigtoe	<i>Pleurobema plenum</i>	Endangered
Fanshell	<i>Cyprogenia stegaria</i>	Endangered
Ring Pink	<i>Obovaria retusa</i>	Endangered
Plants		
Running Buffalo Clover	<i>Trifolium stoloniferum</i>	Endangered

3.0 POTENTIAL THREATENED/ENDANGERED SPECIES HABITAT IN PROJECT

Gray Bat

Gray bats inhabit caves year-round. In the winter, the gray bat hibernates in deep vertical caves. In the summer, they roost in caves scattered along rivers. There was no karst topography within the Project Area and no caves were identified within or adjacent to the Project Area during habitat survey on February 19, 2016. Therefore, the proposed Project does not contain the required habitat for the gray bat.

Indiana Bat/Northern Long-Eared Bat

The USFWS Kentucky Field Office (KFO) has developed the Conservation Strategy for Forest-Dwelling Bats in the Commonwealth of Kentucky. The project area is not located within known habitat for any of the Myotid species; the project area does occur within potential habitat of each of the species. Suitable habitat for the Indiana and northern long-eared bats includes roosting and foraging habitat, travel corridors, and hibernacula. Hibernacula, winter habitat, includes caves and, to a lesser extent, abandoned mines where the ambient temperature remains below 50°F but rarely drops below freezing.

The KFO uses the follow definitions for roost trees:

- “Suitable Indiana bat primary maternity roost tree” refers to a dead or partially dead tree that is at least 9 inches in diameter at breast height (DBH) and has cracks, crevices, and/or loose or exfoliating bark.
- “Optimal Indiana bat primary maternity roost tree” refers to trees with the characteristics above that are in excess of 16 inches DBH.
- “Suitable roost tree” refers to a tree (live or dead) that exhibits any of the following characteristics: exfoliating bark, crevices or cracks. Indiana and/or northern long-eared bats typically roost under exfoliating bark, in cavities of dead, dying, and live trees, and in snags (i.e., dead trees or dead portions of live trees). For Indiana bats, suitable roost trees will have a DBH of 5 inches or greater; for northern long-eared bats, the minimum DBH is 3 inches and includes trees with cavities in addition to the above-mentioned characteristics attributable to Indiana bat roosts.

Summer habitat refers to suitable summer habitat used by any Indiana bat or northern long-eared bat, regardless of reproductive condition. For northern long-eared bat, known summer habitat occurs within 3 miles of a capture location or 1.5 miles of a documented roost tree. Maternity roost trees are typically within canopy gaps in a forest, in a fence-line, and along the edges of wooded areas, frequently associated with streams, floodplain, forests, forested wetlands, and impounded water bodies. Travel corridors are areas that link roosting and foraging habitat, including open-understory forest, wooded fence-rows, and open paths through wooded areas, including streams, trails, and small roads with canopy cover. There were no caves or abandoned mines identified within the project area. The field survey identified 4 trees in the project area possessing characteristics of a suitable, suitable primary, or optimal primary tree.

The Project Area is located outside of known forest-dwelling bat habitat; the area is designated as Potential Habitat by the USFWS, Kentucky Field Office (KFO). Impacts to potential habitat requires mitigation per guidelines of the KFO *Conservation Strategy for Forest-Dwelling Bats*. The current rate for mitigation is \$3,250.00/acre if the habitat is removed between April 1 and October 14th, or half of said amount (\$1,625.00) if between October 15th and March 31st. At this time, the Conservation Strategy does not cover tree removal in June or July.

Project plans will require tree removal in April 2017 and the project proponent will commit to the required payment into the Imperiled Bat Conservation Fund (IBCF) sufficient to meet the required mitigation needs. Tree removal will total 1.80 acres. The total mitigation payment will be \$5,850.00 (\$3,250.00/acre x 1.80 acres). A list of the trees identified to be suitable roost trees is attached. The table outlines the species, alive/dead status, DBH, and roost tree designation.

Mussels

According to the USFWS IPaC and county list, there are seven mussel species (clubshell, pink mucket, orangefoot pimpleback, sheepnose, rough pigtoe, fanshell, and ring pink) with the potential to be located within the proposed project area. A review of the required habitat for each of the mussel species and threat status via NatureServe was performed (<http://explorer.natureserve.org/servlet/NatureServe?init=Species>). The seven mussel species require medium to large streams/rivers with, in general, gravel/sand/cobble substrates and fast-flowing water. One of the threats to all of the seven listed mussel species are impoundments.

The Project Area contains only one ephemeral channel that lacks morphology, flow regime and substrate necessary to support the listed mussel species. The stream channel had stagnant water and a silt/clay substrate. Therefore, the proposed Project does not contain the required habitat for any of the mussel species and will not affect the protected mussel species.

Running Buffalo Clover

Suitable habitat for the running buffalo clover generally is mesic woodlands in partial to filtered sunlight, where there is a pattern of moderate periodic disturbance for a prolonged period, such as mowing, trampling, or grazing. It is most often found in regions underlain with limestone or other calcareous bedrock, but not exclusively. It has been reported from a variety of disturbed woodland habitats, including blue-ash savannahs, floodplains, streambanks, shoals (especially where old trails cross or parallel intermittent streams), grazed woodlots, mowed paths (e.g. cemeteries and lawns), old logging roads, jeep trails, skidder trails, mowed wildlife openings within mature forests, and steep, weedy ravines.

The proposed Project contains mostly area with full sun that has been disturbed. There is an areas of partial to filtered sunlight, located along the stream edge. While the field survey was not performed during the flowering period of the running buffalo clover, no species were identified. Laura Kangas, a USFWS Qualified Running Buffalo Clover Surveyor, performed the field survey on February 19, 2016. Based on the existing site conditions, the Project activities are not anticipated to affect running buffalo clover.

4.0 MIGRATORY BIRDS OF CONSERVATION CONCERN

A review of the U.S. Fish and Wildlife Service’s Information, Planning, and Conservation System (IPAC) list determined that 21 species have ranges within the proposed Project area. The species have been identified below in Table 3 and the IPaC has been included as an attachment.

Based on the mobility of the avian species listed within Table 3, we conclude that the proposed Project is not likely to have an adverse effect on the Migratory Birds of Conservation Concern Listed to Have Ranges in the Proposed Project.

5.0 PROPOSED IMPACTS

The proposed CVG Site 6BW Project will require approximately 7 acres of land disturbance for development activities. Forest cover and surface waters will be affected; development activities will occur within and up to approximately 722 feet of ephemeral stream and will require the clearing of up to 1.80 acres of upland deciduous forest.

Table 3 Migratory Birds of Conservation Concern Listed to Have Ranges in Proposed Project Area

Common Name	Scientific Name	Seasonal Occurrence in Project Area	Potential for Project to Impact Species
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Year-Round	No habitat found; nearest large body of water (Ohio River) is 4 miles north of Project area.
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	Breeding	No impacts anticipated due to mobility of species and available surrounding habitat
Blue-winged Warbler	<i>Vermivora pinus</i>	Breeding	
Cerulean Warbler	<i>Dendroica cerulean</i>	Breeding	
Chuck-will’s-widow	<i>Caprimulgus carolinensis</i>	Breeding	
Dickcissel	<i>Spiza Americana</i>	Breeding	
Fox Sparrow	<i>Passerella liaca</i>	Wintering	
Henslow’s Sparrow	<i>Ammondramus henslowii</i>	Breeding	
Kentucky Warbler	<i>Oporornis formosus</i>	Breeding	
Least Bittern	<i>Ixobrychus exilis</i>	Breeding	
Loggerhead Shrike	<i>Lanius ludovicianus</i>	Year- Round	
Peregrine Falcon	<i>Falco peregrinus</i>	Breeding	
Prairie Warbler	<i>Dendroica discolor</i>	Breeding	
Prothonotary Warbler	<i>Protonotaria citrea</i>	Breeding	
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	Year-Round	
Rusty Blackbird	<i>Euphagus carolinus</i>	Wintering	
Sedge Wren	<i>Cistothorus platensis</i>	Migrating	
Short-Eared Owl	<i>Asio flammeus</i>	Wintering	
Willow Flycatcher	<i>Empidonax traillii</i>	Breeding	
Wood Thrush	<i>Hylocichla mustelina</i>	Breeding	
Worm Eating Warbler	<i>Helmitheros vermivorum</i>	Breeding	

6.0 IMPACT MINIMIZATION SUMMARY

KCAB has designed the proposed Project to minimize waterbody impacts and the amount of forest clearing required to the least amount practical. Tree removal activities will total 1.80 acres.

7.0 SUMMARY

The proposed CVG Site 6BW Project Area encompassed a 7-acre area. The parcel contained approximately 722 feet of ephemeral stream. Anticipated development activities within the 7-acre parcel will include construction and operations of a 98,000 square foot commercial structure with two retail locations, construction of parking and circulation areas to support operations for the building, and grading of land to manage stormwater flow.

The Project is not anticipated to adversely affect any listed species due to a combination of lack of habit, species mobility, and mitigation measures. Suitable stream habitat is lacking for the mussel species; site conditions do not support habitat for running buffalo clover and no individuals were identified. Based on the mobility of the avian species listed within Table 3, we conclude that the proposed Project is not likely to have an adverse effect on the Migratory Birds of Conservation Concern Listed to Have Ranges in the Proposed Project area. The necessary tree removal will occur during the month of April 2017 and the Project proponent will commit to the required \$5,850.00 payment into the Imperiled Bat Conservation Fund (IBCF) sufficient to meet the required mitigation regarding the Indiana bat and Northern long-eared bat.

At your earliest convenience, please provide your concurrence that this Project will not result in any adverse effects on federally protected species. Should you have any questions, please do not hesitate to contact me at 865-560-1601. Also, please feel free to contact Debbie Conrad of KCAB at 859-767-7021. We appreciate your timely review of this request.

Sincerely,



Jenny Sunday
Project Manager

Enclosures (4):

- 1- Figure 1 – USGS Topographic Map, Aerial Imagery Map
- 2- Habitat Photographs
- 3- Bat Roost Tree Inventory
- 4- USFWS Information, Planning, and Conservation System (IPaC) Summary
- 5- Construction Drawing

Cc: Sarah Potter, Landrum & Brown
Debbie Conrad, KCAB

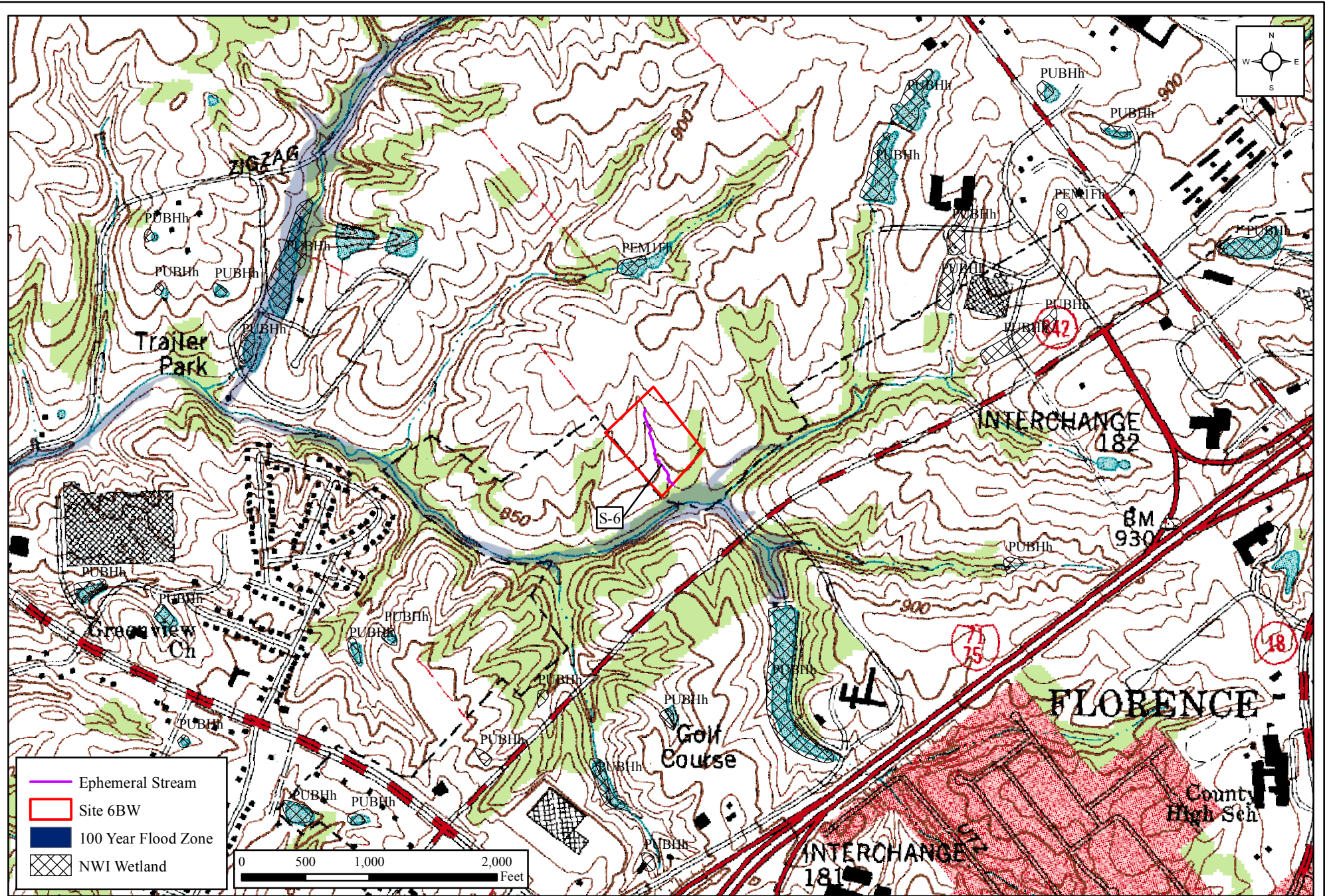


Figure 1
 Kenton County Airport Board
 Cincinnati/Northern Kentucky International Airport
 Ted Bushelman Boulevard Development
 Site 6BW
 Boone County, Kentucky

USGS 7.5' Topographic Map
 Burlington, KY Quadrangle
 1:12,000
 Environment & Archaeology
 LLC



Figure 2

Kenton County Airport Board
 Cincinnati/Northern Kentucky International Airport
 Ted Bushelman Boulevard Development
 Site 6BW
 Boone County, Kentucky

Aerial Map
 Aerial provided by ESRI Map Services
 1:3,600
 Environment & Archaeology
 LLC





											
Photo:	1	Direction:	E	Date:	2/19/2016	Photo:	2	Direction:	NNW	Date:	2/19/2016
Comments: Representative overview of mixed deciduous forest with a relatively disturbed, open understory, as seen within the south-central portion of the survey area.						Comments: Representative overview of narrow segment of mixed deciduous forest with a dense, disturbed understory, bordering old field.					
											
Photo:	3	Direction:	N	Date:	2/19/2016	Photo:	4	Direction:	N	Date:	8/21/2014
Comments: Overview of potential suitable Myotis bat primary maternity roost tree (16-inch diameter dead black cherry).						Comments: Stream-6, upstream view, lower reach					



Photo:	5	Direction:	S	Date:	8/21/2014
Comments: Stream-6, downstream view, lower reach					

Table A1 **Identified suitable roost trees present within the Project Area**

Tree	Species	DBH (inches)	Roost Designation	Alive
1	<i>Prunus serotina</i>	16	Optimal Primary	No
2	<i>Prunus serotina</i>	6	Suitable	Partial
3	<i>Prunus serotina</i>	5	Suitable	No
4	<i>Fraxinus sp.</i>	8	Suitable	No

CVG Site 6BW

IPaC Trust Resources Report

Generated September 20, 2016 01:21 PM MDT, IPaC v3.0.9

This report is for informational purposes only and should not be used for planning or analyzing project level impacts. For project reviews that require U.S. Fish & Wildlife Service review or concurrence, please return to the IPaC website and request an official species list from the Regulatory Documents page.

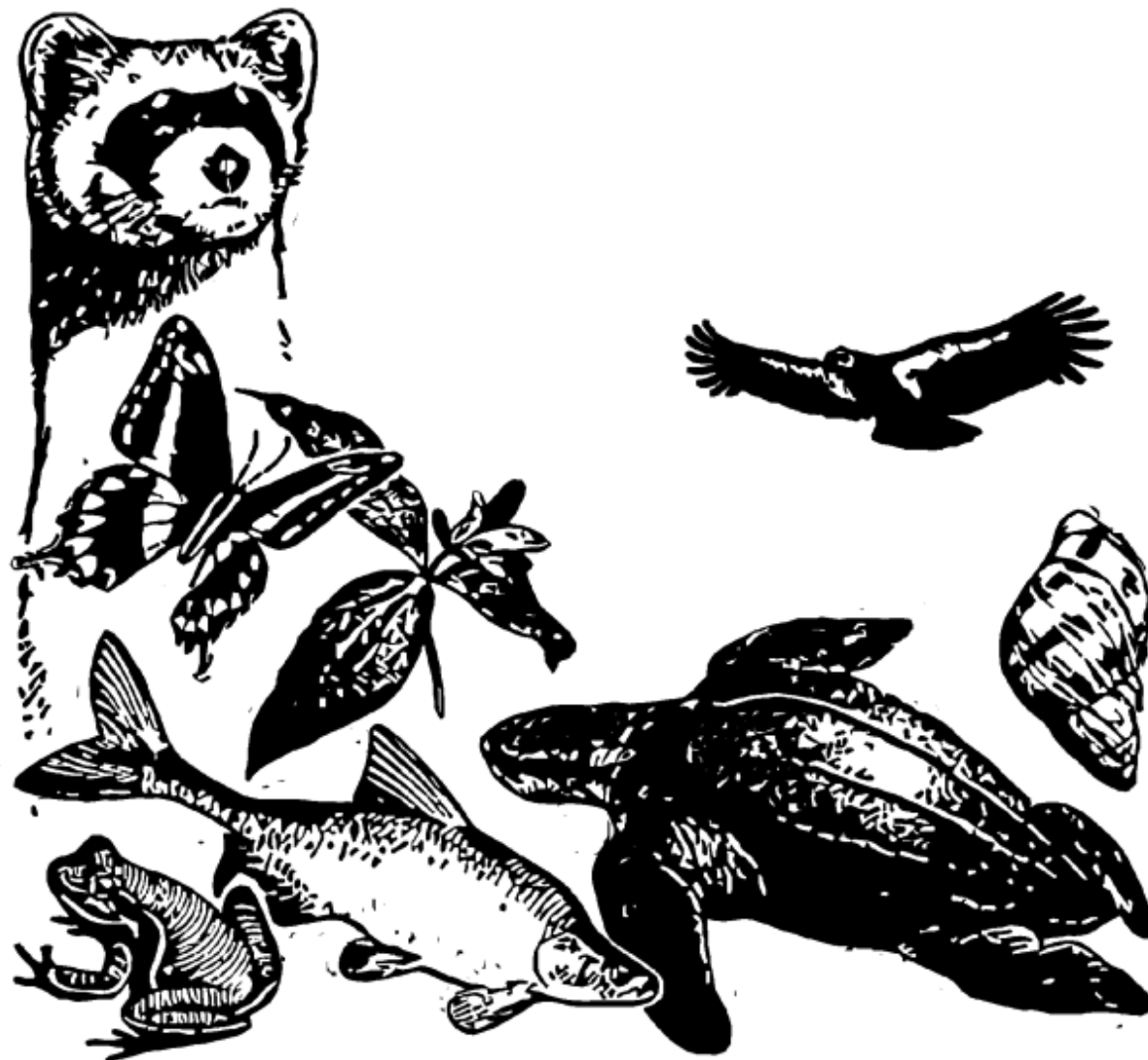


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- IPaC Trust Resources Report [1](#)
- Project Description [1](#)
- Endangered Species [2](#)
- Migratory Birds [5](#)
- Refuges & Hatcheries [7](#)
- Wetlands [8](#)

U.S. Fish & Wildlife Service

IPaC Trust Resources Report



NAME

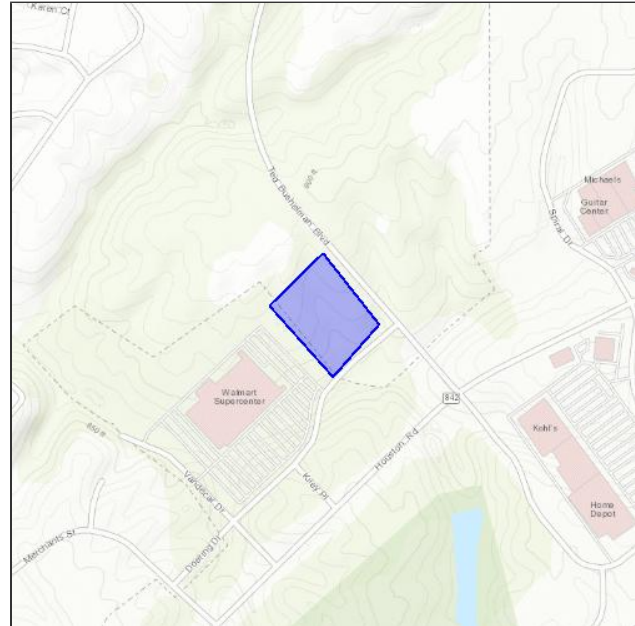
CVG Site 6BW

LOCATION

Boone County, Kentucky

IPAC LINK

<https://ecos.fws.gov/ipac/project/454LQ-FK23F-BCZKE-MCBCB-VEQCRY>



U.S. Fish & Wildlife Service Contact Information

Trust resources in this location are managed by:

Kentucky Ecological Services Field Office

J C Watts Federal Building, Room 265

330 West Broadway

Frankfort, KY 40601-8670

(502) 695-0468

Endangered Species

Proposed, candidate, threatened, and endangered species are managed by the [Endangered Species Program](#) of the U.S. Fish & Wildlife Service.

This USFWS trust resource report is for informational purposes only and should not be used for planning or analyzing project level impacts.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list from the Regulatory Documents section.

[Section 7](#) of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency.

A letter from the local office and a species list which fulfills this requirement can only be obtained by requesting an official species list either from the Regulatory Documents section in IPaC or from the local field office directly.

The list of species below are those that may occur or could potentially be affected by activities in this location:

Clams

Clubshell *Pleurobema clava* Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=F01D

Fanshell *Cyprogenia stegaria* Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=F02H

Orangefoot Pimpleback (pearlymussel) *Plethobasus cooperianus* Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=F00R

Pink Mucket (pearlymussel) *Lampsilis abrupta* Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=F00G

Ring Pink (mussel) *Obovaria retusa* Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=F00S

Rough Pigtoe *Pleurobema plenum* Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=F00P

Sheepnose Mussel *Plethobasus cyphus* Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=F046

Flowering Plants

Running Buffalo Clover *Trifolium stoloniferum* Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=Q2RE

Mammals

Gray Bat *Myotis grisescens*

Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=A04J

Indiana Bat *Myotis sodalis*

Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=A000

Northern Long-eared Bat *Myotis septentrionalis*

Threatened

THIS SPECIES ONLY NEEDS TO BE CONSIDERED IF THE FOLLOWING CONDITION APPLIES

This project would result in take other than incidental take.

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=A0JE

Critical Habitats

There are no critical habitats in this location

Migratory Birds

Birds are protected by the [Migratory Bird Treaty Act](#) and the [Bald and Golden Eagle Protection Act](#).

Any activity that results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish & Wildlife Service.^[1] There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures.

1. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

Additional information can be found using the following links:

- Birds of Conservation Concern
<http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Conservation measures for birds
<http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Year-round bird occurrence data
<http://www.birdscanada.org/birdmon/default/datasummaries.jsp>

The following species of migratory birds could potentially be affected by activities in this location:

Bald Eagle <i>Haliaeetus leucocephalus</i>	Bird of conservation concern
Season: Year-round http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B008	
Black-billed Cuckoo <i>Coccyzus erythrophthalmus</i>	Bird of conservation concern
Season: Breeding http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0H1	
Blue-winged Warbler <i>Vermivora pinus</i>	Bird of conservation concern
Season: Breeding	
Cerulean Warbler <i>Dendroica cerulea</i>	Bird of conservation concern
Season: Breeding http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B091	
Chuck-will's-widow <i>Caprimulgus carolinensis</i>	Bird of conservation concern
Season: Breeding	

Dickcissel <i>Spiza americana</i> Season: Breeding	Bird of conservation concern
Fox Sparrow <i>Passerella iliaca</i> Season: Wintering	Bird of conservation concern
Henslow's Sparrow <i>Ammodramus henslowii</i> Season: Breeding http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B09D	Bird of conservation concern
Kentucky Warbler <i>Oporornis formosus</i> Season: Breeding	Bird of conservation concern
Least Bittern <i>Ixobrychus exilis</i> Season: Breeding http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B092	
Loggerhead Shrike <i>Lanius ludovicianus</i> Season: Year-round http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0FY	Bird of conservation concern
Peregrine Falcon <i>Falco peregrinus</i> Season: Breeding http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0FU	Bird of conservation concern
Prairie Warbler <i>Dendroica discolor</i> Season: Breeding	Bird of conservation concern
Prothonotary Warbler <i>Protonotaria citrea</i> Season: Breeding	Bird of conservation concern
Red-headed Woodpecker <i>Melanerpes erythrocephalus</i> Season: Year-round	Bird of conservation concern
Rusty Blackbird <i>Euphagus carolinus</i> Season: Wintering	Bird of conservation concern
Sedge Wren <i>Cistothorus platensis</i> Season: Migrating	Bird of conservation concern
Short-eared Owl <i>Asio flammeus</i> Season: Wintering http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0HD	Bird of conservation concern
Willow Flycatcher <i>Empidonax traillii</i> Season: Breeding http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0F6	Bird of conservation concern
Wood Thrush <i>Hylocichla mustelina</i> Season: Breeding	Bird of conservation concern
Worm Eating Warbler <i>Helmitheros vermivorum</i> Season: Breeding	Bird of conservation concern

Wildlife refuges and fish hatcheries

There are no refuges or fish hatcheries in this location

Wetlands in the National Wetlands Inventory

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

DATA LIMITATIONS

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

DATA EXCLUSIONS

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

DATA PRECAUTIONS

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

There are no wetlands in this location



**TOURISM, ARTS AND HERITAGE CABINET
KENTUCKY DEPARTMENT OF FISH & WILDLIFE RESOURCES**

Matthew G. Bevin
Governor

Don Parkinson
Secretary

#1 Sportsman's Lane
Frankfort, Kentucky 40601
Phone (502) 564-3400
1-800-858-1549
Fax (502) 564-0506
fw.ky.gov

Regina Stivers
Deputy Secretary

Gregory K. Johnson
Commissioner

29 September 2016

Environment & Archaeology, LLC
Attn: Jenny Sunday
221 Main Street
Florence, KY 41042

RE: Section 7 Threatened and Endangered Species Consultation
CVG Site 6BW
Ted Bushelman Boulevard Development
Cincinnati/Northern Kentucky International Airport in Boone County, Kentucky

Dear Ms. Sunday:

The Kentucky Department of Fish and Wildlife Resources (KDFWR) has received your request for information pertaining to the subject project. KDFWR recommends continued correspondence with the U.S. Fish and Wildlife Service Kentucky Field Office as it relates to imperiled bat species. It appears the dollar amount for mitigation has been already established.

To minimize impacts to the aquatic environment, the KDFWR recommends erosion control measures be developed and implemented prior to construction to reduce siltation into waterways and/or karst features located within the project area. Such erosion control measures may include, but are not limited to silt fences, staked straw bales, brush barriers, sediment basins, and diversion ditches. Erosion control measures will need to be installed prior to construction and should be inspected and repaired regularly as needed.

I hope this information is helpful to you, and if you have questions or require additional information, please call me at (502) 564-7109 extension 4453.

Sincerely,

A handwritten signature in blue ink that reads "Dan Stoelb".

Dan Stoelb
Environmental Scientist

Cc: Environmental Section File



U.S. Department
of Transportation
**Federal Aviation
Administration**

Memphis Airports District Office
2600 Thousand Oaks Blvd, Suite 2250
Memphis, TN 38118
Phone: 901-322-8180

January 29, 2016

Mr. Craig Potts
Executive Director and State Historic Preservation Officer
Kentucky Heritage Council
300 Washington Street
Frankfort, KY 40601

Dear Mr. Potts:

**RE: Determination of Effects
Cincinnati/North Kentucky International Airport (CVG)
Boone County, KY
KHC # 42290-3**

The Federal Aviation Administration (FAA) Memphis Airports District Office (MEM-ADO) is seeking concurrence for a determination under Section 106 of the National Historic Preservation Act (NHPA) for a proposed undertaking at the Cincinnati/Northern Kentucky International Airport (CVG or Airport) located in Hebron, KY. The proposed undertaking consists of constructing multiple warehouse/distribution and retail structures on the south side of the Airport. The structures are projected to total approximately 717,600 square feet in size and located on the east and west sides of Ted Bushelman Boulevard (known as Sites 6A, 6B, and 6C).

After reviewing the project related information, which included correspondence from your office dated August 7, 2014, the FAA has concluded the proposed undertaking would not affect historic properties and that obligations under Section 106 of the NHPA have been fulfilled. I respectfully request your review of the proposed undertaking as well as your concurrence or objection to the enclosed determination. If you have any questions, please feel welcome to contact me at (901) 322-8192 or by email at aaron.braswell@faa.gov.

Sincerely,

Aaron Braswell
Environmental Protection Specialist, Memphis Airports District Office

Enclosure

Cc: Debbie Conrad, Kenton County Airport Board (electronic copy)
Rob Adams, Landrum & Brown (electronic copy)

FAA Section 106 Effects Determination

Airport and Project Proponent Information:

Airport: Cincinnati/Northern Kentucky International Airport (CVG), 2939 Terminal Drive, Hebron, KY 41048

Project Proponent: Kenton County Airport Board, Post Office Box 752000, Cincinnati, OH 45275

Description of Undertaking/Proposed Action:

The Kenton County Airport Board is proposing a project that would involve the following elements:

1. Site preparation of Site 6A (Latitude 39° 00' 53" Longitude -84° 39' 09"), Site 6B west (Latitude 39° 00' 48" Longitude -84° 38' 56"), and Site 6C (Latitude 39° 01' 05" Longitude -84° 89' 52"), which measure approximately 104 acres in size and are located on the east and west sides of Ted Bushelman Boulevard.
2. Construction and operation of a 511,500 square foot commercial warehouse/distribution structure on Sites 6A and 6B west.
3. Construction of a 180,000 square foot building and three smaller retail buildings on Site 6C.
4. Construction of two above ground tunnels on Site 6C.
5. Construction of parking and circulation areas to support operations for these buildings.
6. Grading of land to facilitate stormwater flow, including the creation of a stormwater detention facility on Site 6C.
7. Trenching to construct sanitary sewer lines on the proposed project sites.
8. Construction and operation of a pump station on Site 6A for the new sanitary sewer lines.

Determination of and Description of the Area of Potential Effects (APE):

The APE for the assessment of cultural resources was defined for the project site. The APE for the viewshed/above ground resources was defined by a 1,000 foot radius around the project site. The abundance of mature trees and other development around the project site limited the size of the APE.

Steps Taken to Identify Historic Properties in the APE:

A Phase I Cultural Resources Survey was completed by Gray and Pape, Inc. in June 2014 for multiple sites, including Site 6A, 6B, and 6C. The survey identified two archaeological sites on the subject property. The author of the Phase I survey Report concluded that neither site was eligible for the National Register of Historic Places (NRHP) and recommended no further archaeological work be completed. The Phase I Report was submitted to, and reviewed by, the Kentucky Heritage Council (KHC). KHC responded to the report in a letter dated August 7, 2014 (See KHC # 42290-3). Based on the letter, KHC concurred with the findings and recommendations in the report.

The site boundary completed by Gray and Pape for Site 6A did not completely cover the project site. Two nearby previous surveys (Clifford, 2000; Erickson and Crider, 2010) also did not completely cover the site. As a result, an additional field survey was completed by Environment and Archaeology, LLC. in August 2015 for an approximately 1.98 acre portion of land contiguous to the original survey area completed in

June 2014. No cultural material and no archaeological sites were identified in this additional area (See exhibit 2 for extents of current and previous survey areas).

The June 2014 Report, the August 2014 KHC Letter, and August 2015 Report are all attached to this letter.

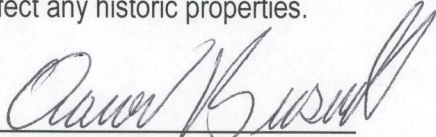
There are approximately 300 mobile homes and 80 single family detached homes located within the 1000-foot viewshed portion of the APE (See Exhibit 2 for graphic depiction of area of potential effect and survey areas). The mobile homes are located in a mobile home development referred to as the Lakes. There is no additional information available for the specific mobile homes due to the transient nature of mobile homes. The single family detached homes include ranch style homes built in the 1950s and located on Greenview Rd, Orchid Rd., Garden Rd., Edgehill Rd, Colony Dr, and Green Dr. in Florence, Kentucky. Area reconnaissance of the area for viewshed impacts completed in October 2015 did not identify any features that would indicate the homes were in any way unique or different than the multitude of 1950s ranch homes in the area. Therefore, none of these homes are considered potentially eligible for the NRHP.

Conclusions:

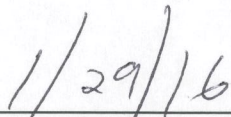
- Based on Phase I Surveys, the proposed action is not likely to impact cultural resources.
- Based on reconnaissance of the viewshed area, there are no resources potentially eligible for the NRHP within the APE. Unidentified historic structures may exist within the viewshed but outside of the APE. However, adverse impacts to such properties are not anticipated due to 1) existing trees and other foliage between those properties and the development site and 2) the proposed undertaking is consistent with existing industrial/commercial development in the project vicinity.

FAA Determination of Effects:

Based on an evaluation of the details of the proposed undertaking/proposed action in conjunction with the research summarized above, FAA has concluded that the proposed undertaking/proposed action would not affect any historic properties.



Aaron Braswell
Environmental Protection Specialist
Federal Aviation Administration
Memphis Airports District Office



Date



MATTHEW G. BEVIN
GOVERNOR

DON PARKINSON
SECRETARY

TOURISM, ARTS AND HERITAGE CABINET
KENTUCKY HERITAGE COUNCIL
THE STATE HISTORIC PRESERVATION OFFICE

300 WASHINGTON STREET
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PHONE (502) 564-7005
FAX (502) 564-5820
www.heritage.ky.gov

REGINA STIVERS
DEPUTY SECRETARY

CRAIG A. POTTS
EXECUTIVE DIRECTOR
& STATE HISTORIC
PRESERVATION OFFICER

March 8, 2016

Mr. Aaron Braswell
Environmental Protection Specialist
Memphis Airports District Office
Federal Aviation Administration
2600 Thousand Oaks Blvd, Suite 2250
Memphis, TN 38118

Re: Determination of Effects
Cincinnati / North Kentucky International Airport (CVG)
Boone County, KY KHC# 42290-3

Dear Mr. Braswell:

Thank you for the information concerning the above referenced project. This proposed undertaking consists of constructing multiple warehouses/distribution and retail structures on the south side of the airfield.

We concur with your assessment that there will be No Historic Properties Affected.

Should the project plans change, or should additional information become available regarding cultural resources or citizens' concerns regarding impacts to cultural resources, please submit that information to our office as additional consultation may be warranted. Should you have any questions, feel free to contact Nick Laracuente of my staff at 502.564.7005, extension 122.

Sincerely,

Craig A. Potts,
Executive Director and
State Historic Preservation Officer

CP:nrl KHC # 46136

#Preservation50: Commemorating the 50th anniversary of the National Historic Preservation Act
and the Kentucky Heritage Council 1966-2016

Enclosure 7
Preliminary JD and
Water Resource Table

ATTACHMENT

PRELIMINARY JURISDICTIONAL DETERMINATION FORM – CVG Site 6BW

BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR PRELIMINARY JURISDICTIONAL DETERMINATION (JD): October 30, 2014

B. NAME AND ADDRESS OF PERSON REQUESTING PRELIMINARY JD:
Candace McGraw
Kenton County Airport Board (KCAB)
Cincinnati/Northern Kentucky International Airport
P.O. Box 752000
Cincinnati, OH 45275

C. DISTRICT OFFICE, FILE NAME, AND NUMBER: Louisville, Kentucky

**D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION:
(USE THE ATTACHED TABLE TO DOCUMENT MULTIPLE WATERBODIES AT DIFFERENT SITES)**

State: Kentucky County/parish/borough: Boone
Center coordinates of site (lat/long in degree decimal format):
Lat. 39.012952N, Long. -84.648458W.

Universal Transverse Mercator:

Name of nearest waterbody: Perennial tributary to Gunpowder Creek

Identify (estimate) amount of waters in the review area:

Non-wetland waters:
Ephemeral stream = 722 linear feet: 3 to 4.5 feet in width and/or 0.06 acres
Cowardin Class: Riverine
Stream Flow: Ephemeral
Wetlands: 0
Cowardin Class:

Name of any water bodies on the site that have been identified as Section 10 waters:

Tidal:

Non-Tidal:

E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

Office (Desk) Determination. Date:
 Field Determination. Date(s): 21 and 22-Aug-2014, 8-Sep-2014, 19-Feb-2016

1. The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time.

2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable.

This preliminary JD finds that there “*may be*” waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

SUPPORTING DATA. Data reviewed for preliminary JD (check all that apply

- checked items should be included in case file and, where checked and requested, appropriately reference sources below):

- Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: *Environment & Archaeology, LLC* and *Viox & Viox*
- Data sheets prepared/submitted by or on behalf of the applicant/consultant.
 - Office concurs with data sheets/delineation report.
 - Office does not concur with data sheets/delineation report.
- Data sheets prepared by the Corps: .
- Corps navigable waters’ study: .
- U.S. Geological Survey Hydrologic Atlas: .
 - USGS NHD data.
 - USGS 8 and 12 digit HUC maps.
- U.S. Geological Survey map(s). Cite scale & quad name: Burlington 1:12,000.
- USDA Natural Resources Conservation Service Soil Survey. Citation: USDA Soil Data Mart.
- National wetlands inventory map(s). Cite name: Burlington, Kentucky.
- State/Local wetland inventory map(s): .
- FEMA/FIRM maps: .
- 100-year Floodplain Elevation is: (National Geodetic Vertical Datum of 1929)
- Photographs: Aerial (Name & Date): 2014.
or Other (Name & Date): 2014 Site photos.
- Previous determination(s). File no. and date of response letter: .
- Other information (please specify):.

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

Signature and date of
Regulatory Project Manager
(REQUIRED)

Signature and date of
person requesting preliminary JD
(REQUIRED, unless obtaining
the signature is impracticable)

Site number	Latitude	Longitude	Cowardin Class	Estimated amount of aquatic resource in review area	Class of aquatic resource
Stream 6	39.01269	-84.64851	Riverine	722 feet/0.06 acres	Non-section 10 - non-wetland

Waters Upload Sheet - CVG - Site 6BW Project

Waters Name	Other Name	Cowadin Code	HGM Code	Measurement Type	Amount	Units	Waters Types	Latitude	Longitude	Local Waterway
Stream 6		R6	Riverine	Linear	722	FOOT	RPW	39.01295	-84.648458	Gunpowder Creek



U.S. Department
of Transportation
**Federal Aviation
Administration**

Memphis Airports District Office
2600 Thousand Oaks Blvd, Suite 2250
Memphis, TN 38118
Phone: 901-322-8180

January 29, 2016

Mr. Craig Potts
Executive Director and State Historic Preservation Officer
Kentucky Heritage Council
300 Washington Street
Frankfort, KY 40601

Dear Mr. Potts:

**RE: Determination of Effects
Cincinnati/North Kentucky International Airport (CVG)
Boone County, KY
KHC # 42290-3**

The Federal Aviation Administration (FAA) Memphis Airports District Office (MEM-ADO) is seeking concurrence for a determination under Section 106 of the National Historic Preservation Act (NHPA) for a proposed undertaking at the Cincinnati/Northern Kentucky International Airport (CVG or Airport) located in Hebron, KY. The proposed undertaking consists of constructing multiple warehouse/distribution and retail structures on the south side of the Airport. The structures are projected to total approximately 717,600 square feet in size and located on the east and west sides of Ted Bushelman Boulevard (known as Sites 6A, 6B, and 6C).

After reviewing the project related information, which included correspondence from your office dated August 7, 2014, the FAA has concluded the proposed undertaking would not affect historic properties and that obligations under Section 106 of the NHPA have been fulfilled. I respectfully request your review of the proposed undertaking as well as your concurrence or objection to the enclosed determination. If you have any questions, please feel welcome to contact me at (901) 322-8192 or by email at aaron.braswell@faa.gov.

Sincerely,

Aaron Braswell
Environmental Protection Specialist, Memphis Airports District Office

Enclosure

Cc: Debbie Conrad, Kenton County Airport Board (electronic copy)
Rob Adams, Landrum & Brown (electronic copy)

FAA Section 106 Effects Determination

Airport and Project Proponent Information:

Airport: Cincinnati/Northern Kentucky International Airport (CVG), 2939 Terminal Drive, Hebron, KY 41048

Project Proponent: Kenton County Airport Board, Post Office Box 752000, Cincinnati, OH 45275

Description of Undertaking/Proposed Action:

The Kenton County Airport Board is proposing a project that would involve the following elements:

1. Site preparation of Site 6A (Latitude 39° 00' 53" Longitude -84° 39' 09"), Site 6B west (Latitude 39° 00' 48" Longitude -84° 38' 56"), and Site 6C (Latitude 39° 01' 05" Longitude -84° 89' 52"), which measure approximately 104 acres in size and are located on the east and west sides of Ted Bushelman Boulevard.
2. Construction and operation of a 511,500 square foot commercial warehouse/distribution structure on Sites 6A and 6B west.
3. Construction of a 180,000 square foot building and three smaller retail buildings on Site 6C.
4. Construction of two above ground tunnels on Site 6C.
5. Construction of parking and circulation areas to support operations for these buildings.
6. Grading of land to facilitate stormwater flow, including the creation of a stormwater detention facility on Site 6C.
7. Trenching to construct sanitary sewer lines on the proposed project sites.
8. Construction and operation of a pump station on Site 6A for the new sanitary sewer lines.

Determination of and Description of the Area of Potential Effects (APE):

The APE for the assessment of cultural resources was defined for the project site. The APE for the viewshed/above ground resources was defined by a 1,000 foot radius around the project site. The abundance of mature trees and other development around the project site limited the size of the APE.

Steps Taken to Identify Historic Properties in the APE:

A Phase I Cultural Resources Survey was completed by Gray and Pape, Inc. in June 2014 for multiple sites, including Site 6A, 6B, and 6C. The survey identified two archaeological sites on the subject property. The author of the Phase I survey Report concluded that neither site was eligible for the National Register of Historic Places (NRHP) and recommended no further archaeological work be completed. The Phase I Report was submitted to, and reviewed by, the Kentucky Heritage Council (KHC). KHC responded to the report in a letter dated August 7, 2014 (See KHC # 42290-3). Based on the letter, KHC concurred with the findings and recommendations in the report.

The site boundary completed by Gray and Pape for Site 6A did not completely cover the project site. Two nearby previous surveys (Clifford, 2000; Erickson and Crider, 2010) also did not completely cover the site. As a result, an additional field survey was completed by Environment and Archaeology, LLC. in August 2015 for an approximately 1.98 acre portion of land contiguous to the original survey area completed in

June 2014. No cultural material and no archaeological sites were identified in this additional area (See exhibit 2 for extents of current and previous survey areas).

The June 2014 Report, the August 2014 KHC Letter, and August 2015 Report are all attached to this letter.

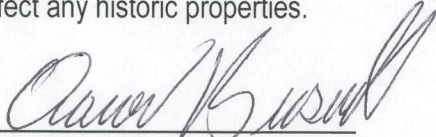
There are approximately 300 mobile homes and 80 single family detached homes located within the 1000-foot viewshed portion of the APE (See Exhibit 2 for graphic depiction of area of potential effect and survey areas). The mobile homes are located in a mobile home development referred to as the Lakes. There is no additional information available for the specific mobile homes due to the transient nature of mobile homes. The single family detached homes include ranch style homes built in the 1950s and located on Greenview Rd, Orchid Rd., Garden Rd., Edgehill Rd, Colony Dr, and Green Dr. in Florence, Kentucky. Area reconnaissance of the area for viewshed impacts completed in October 2015 did not identify any features that would indicate the homes were in any way unique or different than the multitude of 1950s ranch homes in the area. Therefore, none of these homes are considered potentially eligible for the NRHP.

Conclusions:

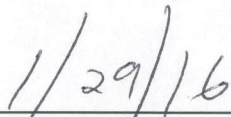
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FAA Determination of Effects:

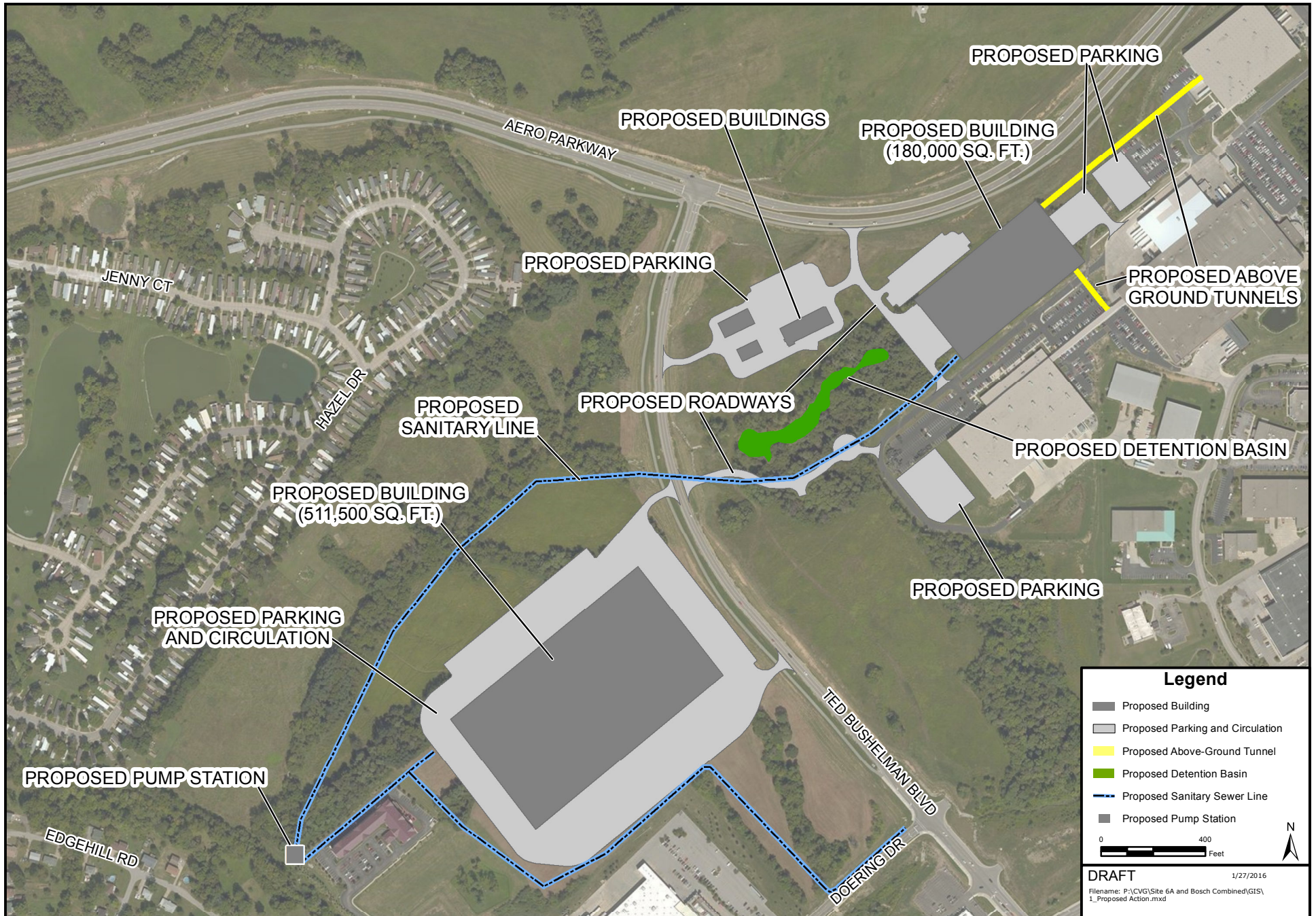
Based on an evaluation of the details of the proposed undertaking/proposed action in conjunction with the research summarized above, FAA has concluded that the proposed undertaking/proposed action would not affect any historic properties.



Aaron Braswell
Environmental Protection Specialist
Federal Aviation Administration
Memphis Airports District Office



Date



PROPOSED PUMP STATION

PROPOSED PARKING AND CIRCULATION

PROPOSED BUILDING (511,500 SQ. FT.)

PROPOSED SANITARY LINE

PROPOSED ROADWAYS

PROPOSED PARKING

PROPOSED BUILDINGS

PROPOSED BUILDING (180,000 SQ. FT.)

PROPOSED PARKING

PROPOSED ABOVE GROUND TUNNELS

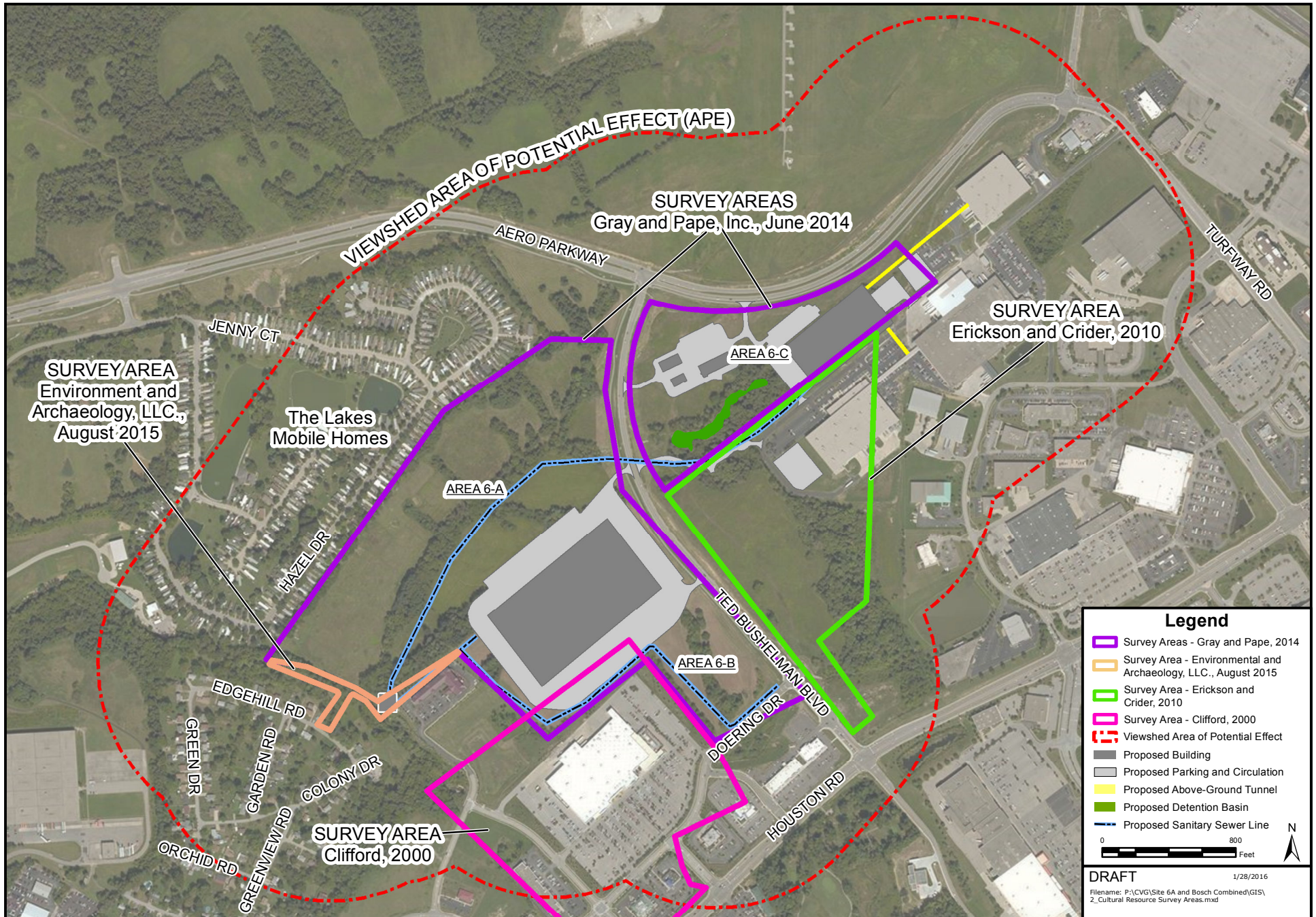
PROPOSED DETENTION BASIN

PROPOSED PARKING

Legend

- Proposed Building
 - Proposed Parking and Circulation
 - Proposed Above-Ground Tunnel
 - Proposed Detention Basin
 - Proposed Sanitary Sewer Line
 - Proposed Pump Station
- 0 400 Feet

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SURVEY AREA
 Environment and
 Archaeology, LLC.,
 August 2015

The Lakes
 Mobile Homes

SURVEY AREAS
 Gray and Pape, Inc., June 2014

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SURVEY AREA
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Legend

- Survey Areas - Gray and Pape, 2014
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- Proposed Parking and Circulation
- Proposed Above-Ground Tunnel
- Proposed Detention Basin
- Proposed Sanitary Sewer Line

0 800 Feet

N

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MATTHEW G. BEVIN
GOVERNOR

TOURISM, ARTS AND HERITAGE CABINET
KENTUCKY HERITAGE COUNCIL
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#Preservation50: Commemorating the 50th anniversary of the National Historic Preservation Act
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Appendix D

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APPENDIX D CULTURAL RESOURCES

This Appendix includes a copy of the materials related to coordination with the Kentucky Heritage Council / State Historic Preservation Office.

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U.S. Department
of Transportation
**Federal Aviation
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January 29, 2016

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FAA Section 106 Effects Determination

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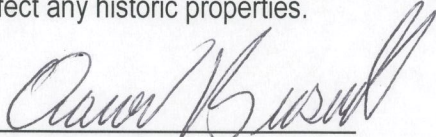
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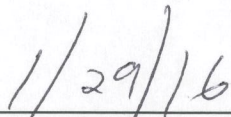
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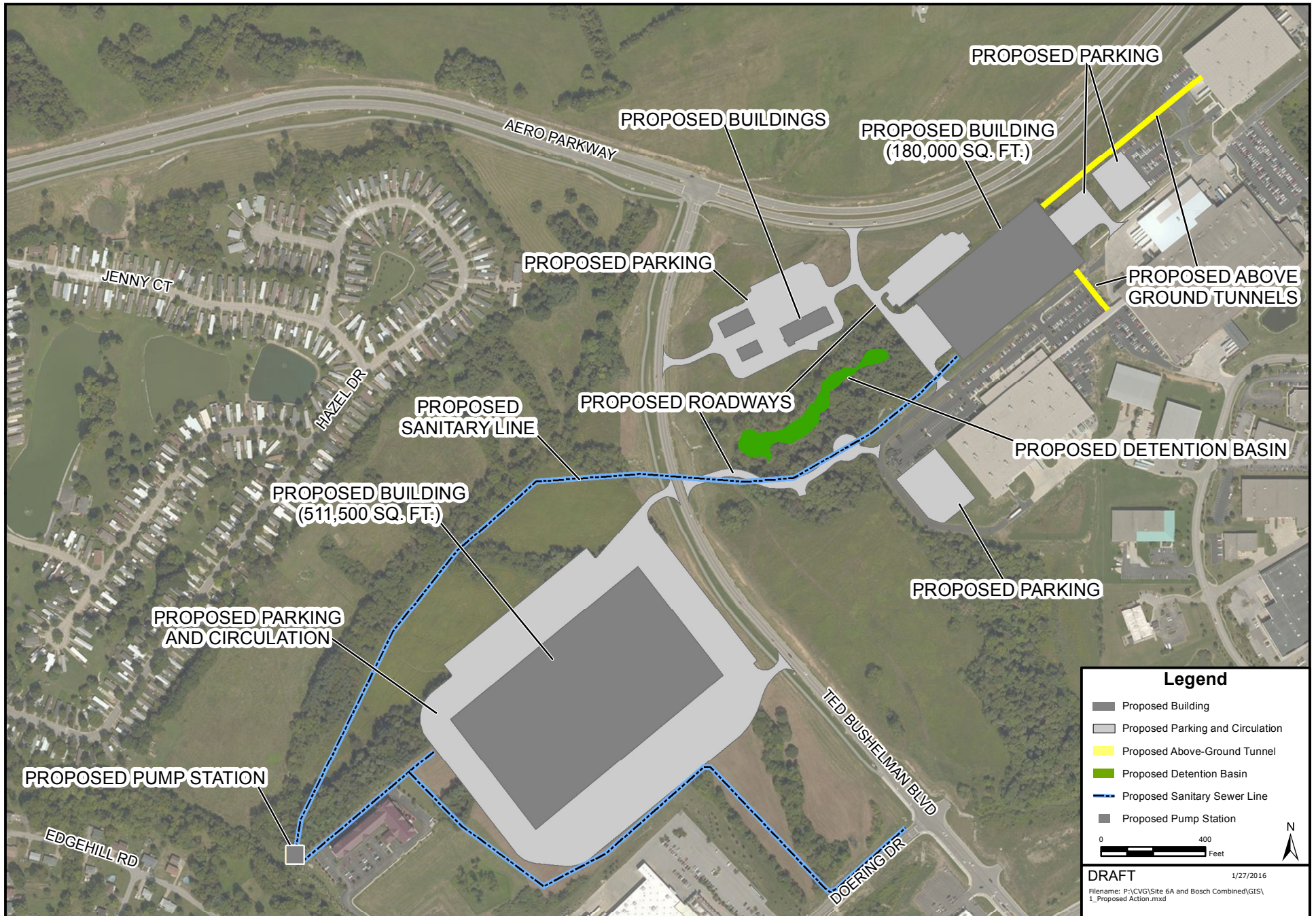
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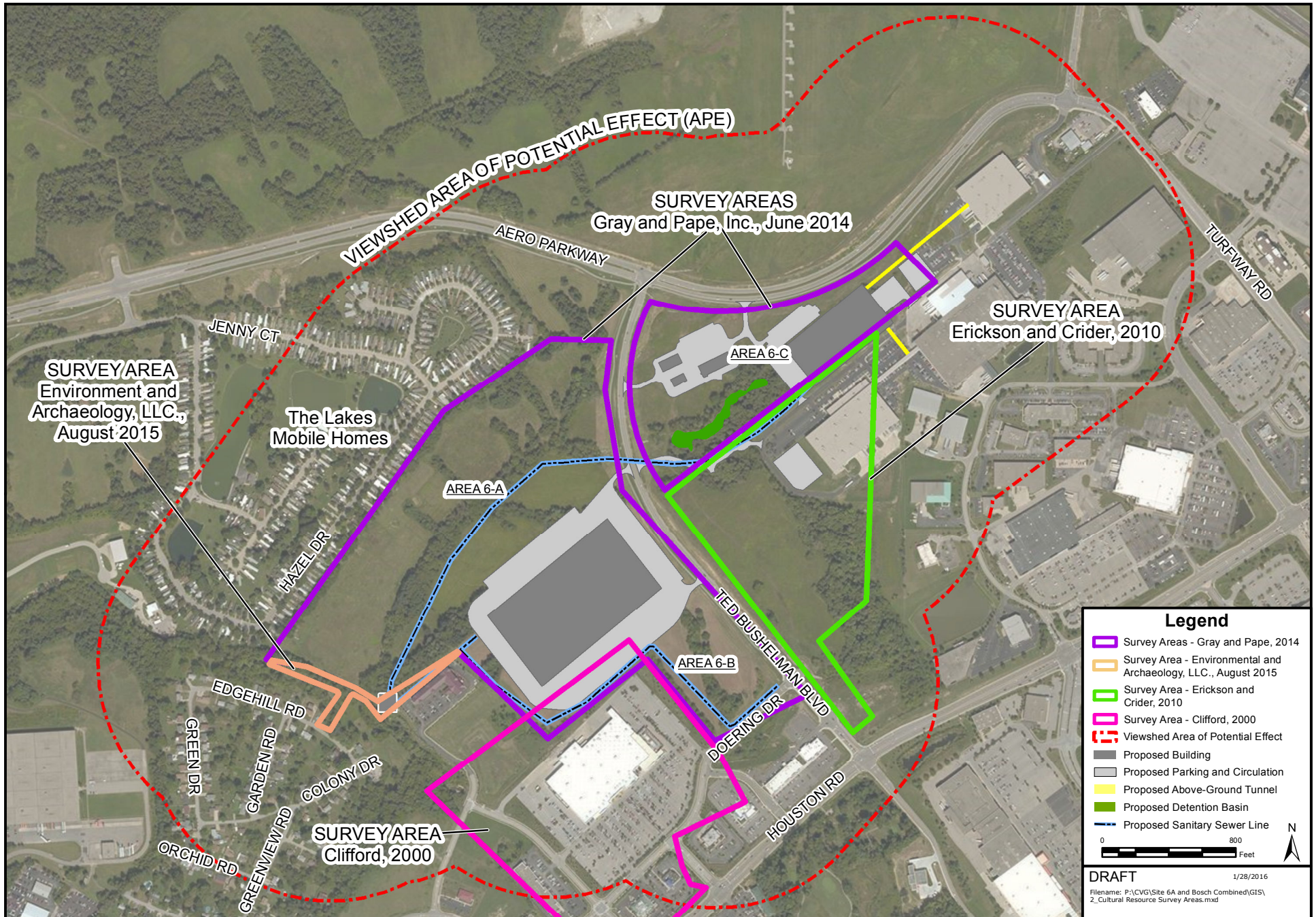


Aaron Braswell
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Date





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State Historic Preservation Officer

CP:nrl KHC # 46136

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and the Kentucky Heritage Council 1966-2016

Attachment

Phase I Cultural Resources Survey for Five
Parcels (3-A, 3-B, 6-A, 6-B, and 6-C) at the
Cincinnati/Northern Kentucky International
Airport, Boone County, Kentucky



STEVEN L. BESHEAR
GOVERNOR

**TOURISM, ARTS AND HERITAGE CABINET
KENTUCKY HERITAGE COUNCIL**

BOB STEWART
SECRETARY

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300 WASHINGTON STREET
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CRAIG A. POTTS
EXECUTIVE DIRECTOR AND
STATE HISTORIC PRESERVATION OFFICER

August 7, 2014

Mr. John W. Picklesimer
Senior Principal Investigator
Gray & Pape Inc.
1318 Main Street
Cincinnati, OH 45202-7614

RE: Phase I Cultural Resources Survey for Five Parcels (3-A, 3-B, 6-A, 6-B, and 6-C) at the Cincinnati / Northern Kentucky International Airport, Boone County, Kentucky

Dear Mr. Picklesimer:

Thank you for the above referenced revised report. The archaeological work for this project entailed pedestrian survey and screened shovel testing within the project area. Two new archaeological sites, 15Be670 and 15Be671, were documented as a result of this survey. Due to the lack of research potential the author finds that neither of these sites are eligible for listing on the National Register of Historic Places (NRHP). The authors recommend no further archaeological work within the project area.

I accept the above-referenced report without further revision and concur with the authors' findings and recommendations. Should you have any questions, feel free to contact Yvonne Sherrick of my staff at 502.564.7005, extension 113.

Sincerely,

Craig A. Potts,
Executive Director and
State Historic Preservation Officer

CP: KHC # 42290-3
Cc: George Crothers (OSA)

*Phase I Cultural Resources Survey for
Five Parcels (3-A, 3-B, 6-A, 6-B, and 6-C)
at the Cincinnati/Northern Kentucky
International Airport, Boone County, Kentucky*



GRAY & PAPE, INC.
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JUNE 11, 2014

LEAD AGENCY:
Federal Aviation Administration

PREPARED FOR:
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— I N C. —
CULTURAL RESOURCES CONSULTANTS

Project No.: 14-67601.001

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Cincinnati/Northern Kentucky International Airport,
Boone County, Kentucky**

Lead Agency: Federal Aviation Administration

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ABSTRACT

Gray & Pape, Inc., Cincinnati, Ohio, was retained by the Kenton County Airport Board, Kentucky, to conduct a Phase I archaeological survey on five parcels of land (Areas 3-A, 3-B, 6-A, 6-B, and 6-C) located adjacent to the Cincinnati/Northern Kentucky International Airport in Boone County, Kentucky. The five parcels, combined, cover an area of approximately 74.6 hectares (184.4 acres). The Phase I investigation was completed pursuant to survey and reporting objectives outlined in the Kentucky Heritage Council's Site Protection Program guidelines and is in compliance with Section 106 of the National Historic Preservation Act of 1966 (36 CFR 800), as amended. The Phase I archaeological investigation is aimed at documenting and assessing the potential eligibility for inclusion in the National Register of Historic Places of any cultural resources that may be adversely affected by future construction projects. The lead agency for this project is the Federal Aviation Administration.

The Phase I investigation consisted of a literature search and archaeological survey of the five parcels, noted above, in accordance with the Kentucky Heritage Council's *Specifications for Conducting Fieldwork and Preparing Cultural Resource Assessment Reports* (2006). The literature review identified no previously recorded sites within Areas 3-A, 3-B, 6-A, 6-B, or 6-C. The archaeological survey identified two new archaeological resources and four isolated finds within the project area: state sites 15Be670 and 15Be671 are located within Area 6-A, Isolated Finds 1 and 4 are located in Area 3-B, and Isolated Finds 2 and 3 are located in Area 3-A. Based on the Phase I results, these newly identified cultural resources are unlikely to yield new and significant information pertaining to prehistoric or historic cultures in the Outer Bluegrass region of Kentucky. Therefore, Site 15Be670, Site 15Be671, Isolated Find 1, Isolated Find 2, Isolated Find 3, and Isolated Find 4 are not considered eligible for inclusion in the National Register of Historical Places under Criteria A, B, C, or D, and Gray & Pape, Inc., recommends no further work.

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1.0 INTRODUCTION

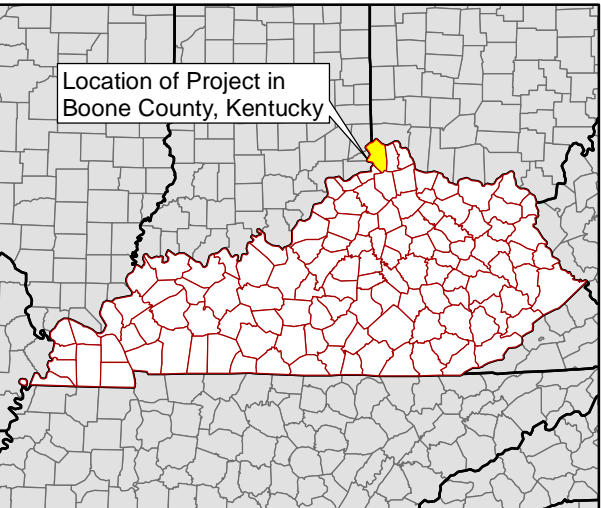
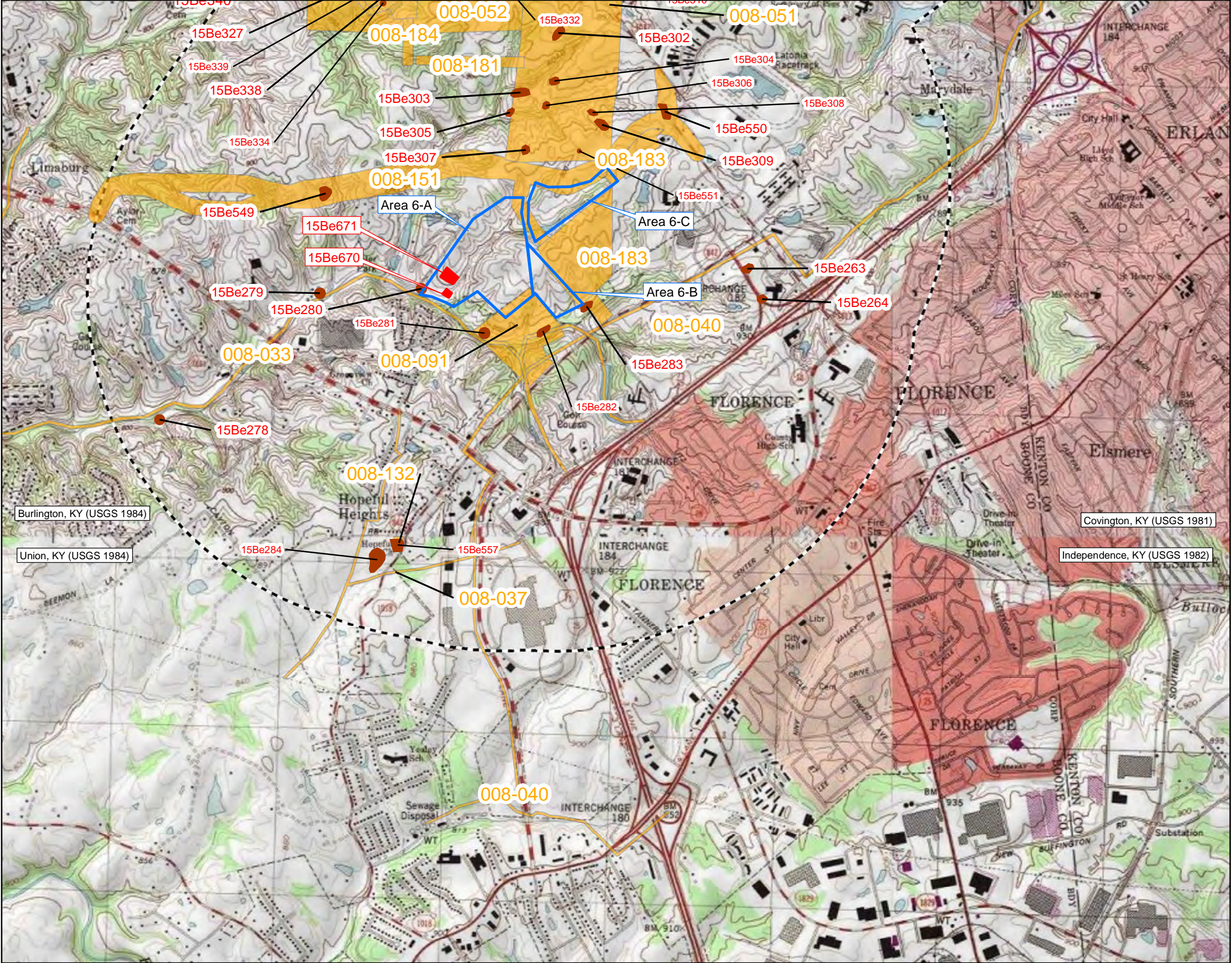
1.1 Project Overview

Gray & Pape, Inc. (Gray & Pape), Cincinnati, Ohio, under contract with the Kenton County Airport Board (KCAB) completed a Phase I archaeological survey of a series of five parcels of land located adjacent to the Cincinnati/Northern Kentucky International Airport in Boone County, Kentucky. The parcels subjected to Phase I archaeological investigations included Areas 3-A (33 acres [ac.]) and 3-B (47 ac.) near the intersection of Mineola Pike and Donaldson Highway (Figure 1), and Areas 6-A (64 ac.), 6-B (15 ac.), and 6-C (25.4 ac.) north of the intersection of Burlington Pike (KY 18) and Houston Road (KY 842) (Figure 2). In total, the Phase I investigations covered an area measuring approximately 74.6 hectares (ha), or 184.4 ac. The Phase I investigation was completed pursuant to survey and reporting objectives outlined in the Kentucky Heritage Council's (KHC) Site Protection Program guidelines and is in compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966 (36 CFR 800), as amended. The Phase I archaeological investigation is aimed at documenting and assessing the potential eligibility for inclusion in the National Register of Historic Places (NRHP) of any cultural resources that may be adversely affected by future construction projects. The lead agency for this project is the Federal Aviation Administration (FAA). Archaeological investigations were conducted between April 28, 2014 and May 2, 2014. There were no constraints related to the project.

The Phase I investigation consisted of a literature search and archaeological survey of the five parcels, noted above, in accordance with the KHC's *Specifications for Conducting Fieldwork and Preparing Cultural Resource Assessment Reports* (2006). The literature review collected data on known cultural resources within a 2-kilometer (km) or 1.2 mile (mi.), radius of the project areas. The data collected was limited to that available at the Kentucky Office of State Archaeologist (KOSA), Lexington, Kentucky, and the KHC, Frankfort, Kentucky. No previously recorded sites were identified within Areas 3-A, 3-B, 6-A, 6-B, or 6-C. The archaeological survey was conducted within the five parcels and consisted of systematic shovel testing. Two new state sites and four isolated finds were identified within the project areas: state sites 15Be670 and 15Be671 are located within Area 6-A, Isolated Finds 1 and 4 are located in Area 3-B, and Isolated Finds 2 and 3 are located in Area 3-A. Based on the Phase I results, these newly identified cultural resources are unlikely to yield new and significant information pertaining to prehistoric or historic cultures in the Outer Bluegrass region of Kentucky. Therefore, Site 15Be670, Site 15Be671, Isolated Find 1, Isolated Find 2, Isolated Find 3, and Isolated Find 4 are not considered eligible for inclusion in the National Register of Historical Places under Criteria A, B, C, or D and Gray & Pape recommends no further work.

FIGURE 1
REDACTED

FIGURE 2
REDACTED



Project Area
 Study Radius (2-km/1.24-mi)
 Previously Recorded Site
 Previous Survey
 Newly Identified Site

USGS 7.5' Quadrangle Citation
 500 0 500 Meters
 1500 0 1500 Feet

Location of Newly Identified Sites in Areas 6-A, 6-B, and 6-C, and Previously Recorded Resources within a 2-km (1.2-mi) Radius Study Area, Boone County, Kentucky

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Figure 2

1.1.1 Acknowledgements

The fieldwork was completed under the supervision of Field Director Patrick McGlade. Field Technicians for the project included Dean Nones, Erin Deliman, Keith Mueller, Kirstyn Leque, David Eichert, Seth Marshall, Donald Handshoe, and Thomas Hahn. Melissa Lavender analyzed the artifacts collected during survey. Michael Striker and John Picklesimer served as the Project Managers. The report was authored by Karen L. Leone and John Picklesimer. Graphics for the report were prepared by Donald Handshoe and Carly Meyer. The report was edited and produced by Julisa Meléndez and Sarah E. Holland.

2.0 RESEARCH DESIGN AND METHODS

2.1 Research Design

The research objective of the Phase I cultural resource survey is to collect site-specific data sufficient for KCAB to utilize in project planning. A Phase I cultural resources inventory and evaluation was conducted of the entire 74.6 ha (184.4 ac.) project area, covering five parcels including Areas 3-A, 3-B, 6-A, 6-B, and 6-C. Additional data that was examined as part of the research design includes the prehistoric and historic environment, culture histories, settlement and subsistence patterns, previously recorded site types in the vicinity of the project area, archival and historical research, and previously recorded cultural resources on file at the KHC and KOSA Offices.

Every archaeological resource identified within the project area was evaluated using the NRHP criteria for evaluation (36 CFR 60.4). Resources that meet the criteria possess historic significance and integrity. The quality of significance in American history, architecture, archaeology, engineering and culture is present in resources that possess integrity of location, design, setting, materials, workmanship, feeling and association, and meet one of the following four criteria:

- Criterion A: are associated with events that have made a significant contribution to the broad patterns of our history;
- Criterion B: are associated with the lives of persons significant in our past;
- Criterion C: embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; and
- Criterion D: have yielded, or may be likely to yield, information important in prehistory or history. The application of Criterion D presupposes that the information imparted by the site is significant in history or prehistory and that at least one of the other National Register criterion is satisfied (U.S. Department of the Interior and National Park Service 1995:2).

2.2 Project Methods

The Phase I investigations associated with the current undertaking were designed to define all sites, prehistoric and historical, within the 74.6-ha (184.4-ac.) project area and to evaluate the potential eligibility of any newly defined site locations for inclusion in the NRHP. The survey areas included Areas 3-A (33 ac.) and 3-B (47 ac.) near the intersection of Mineola Pike and Donaldson Highway (Figure 1), and Areas 6-A (64 ac.), 6-B (15 ac.), and 6-C (25.4 ac.) north of the intersection of Burlington Pike (KY 18) and Houston Road (KY 842) (Figure 2). Area

6-A was subdivided further into varying size fields/segments as necessary to facilitate recordkeeping and archaeological survey methodologies. In total, the project area covered approximately 74.6 ha (184.4 ac.). The entire project area was considered to possess a high potential for containing cultural resources based on the number of previously recorded sites in the immediate area.

2.2.1 Literature Review

Gray & Pape conducted a literature review within a 2-km (1.2-mi.) radius study area around the project area. Sources examined included previously recorded cultural resources on file at the KOSA, Lexington, Kentucky and at the KHC, Frankfort, Kentucky. Additionally, United States Geological Survey (USGS) topographic maps and aerial photographs, United States Department of Agriculture (USDA) Soil Survey maps, and historical county atlases were examined. A summary of the literature review is provided in Section 5.1, below. Figures 1 and 2 show the project areas, locations of newly identified sites, previously conducted cultural resources surveys, and previously recorded cultural resources located in the vicinity of the project area.

2.2.2 Archaeological Field Methods

Fieldwork was conducted between April 28, 2014 and May 2, 2014. Archaeological survey methods and eligibility testing utilized during the Phase I investigations consisted of a combination of systematic shovel testing and walkover survey. Systematic shovel testing was completed in all five areas (surface visibility was less than 20%) using a series of 46 centimeter (cm), or 18-inch (in.), diameter shovel tests positioned along linear transects at 15-meter (m) (50-foot [ft.]) intervals. These shovel tests were excavated through the A horizon to a depth of at least 10 cm (3.9 in.) into the underlying substratum. Removed soils were screened through 0.25-in. hardware cloth, with all recovered artifacts bagged and recorded by shovel test number. Radial shovel tests were excavated around positive shovel tests at intervals of 10 m (33 ft.) on all sides until two negative radial shovel tests were recorded. This methodology is used to best define site boundaries. Walkover survey was conducted in areas that were inundated with water, areas of obvious disturbance, and on slopes greater than 15 percent.

Field data, including survey conditions, work performed, and observed cultural materials, if any, were recorded on standard forms. Sketch maps and GPS-generated maps were prepared for the survey areas to show the location of positive shovel tests, and any identified resources. Photographs were taken of the projects areas and their surroundings to document field conditions at the time of survey.

2.2.3 Laboratory Methods

2.2.3.1 Prehistoric Classification Criteria and Analysis

Current approaches to the analysis of prehistoric lithic artifacts include a study of the step-by-step procedures utilized by prehistoric knappers to make tools. The term used to describe this process is referred to as *chaine operatoire*, or reduction strategy (Sellet 1993). Prehistoric artifacts are sorted by artifact type. In order to analyze the lithic assemblage, a group of

variables was formulated comprising a series of attributes that describes specific aspects of the flaking terminology. Debitage categories are based upon classification schemes currently used by both Old and New World prehistorians (Bordes 1961; Frison 1974; Tixier et al. 1980). Commonly, the term *debitage* is used by prehistorians to describe flakes that have not been modified by secondary retouch and made into tools. The flakes are subdivided, as much as is possible, into groups that would more specifically identify the reduction sequence to which they belong. When subdivided and possible, raw material type is recorded. The following terminology has been applied to the classification of prehistoric artifacts recovered from this project.

(1) Debitage

(A) Flakes

Class 1 - Initial reduction flake

Class 2 - Flake (unspecified reduction sequence)

Class 3 - Biface initial reduction flake

Class 4 - Biface thinning flake

Class 5 - Biface finishing flake

Class 6 - Chip

Class 7 - Flake Fragment

Class 8 - Angular Shatter

Class 9 - Microdebitage

Class 10 - Janus flake

2.2.3.2 Historical Classification Criteria and Analysis

Gray & Pape analyzes historical artifacts according to parallel classificatory schemes: a *descriptive classification* and a *functional classification*; as well as by assessing the function of the artifacts when possible. Although varying levels of information are required for the descriptive classification of different artifacts, this information is arranged in tabular form, permitting the presentation of data for all artifact types in a single table. Because it is set up in this system as a parallel analysis, the functional classification can be changed independently of the descriptive classification, should changes in information concerning the context of the artifacts change the interpretation of their function.

2.2.4 Curation

Recovered artifacts are slated to be returned to the landowner of the archaeological property at the completion of the cultural resources review process. Landowner (KCAB) information will be provided on completed Site Forms on file at the KOSA, Lexington, Kentucky. Until final deposition, all artifacts are housed at Gray & Pape's Cincinnati Archaeology Laboratory, Cincinnati, Ohio.

3.0 ENVIRONMENTAL AND CULTURAL OVERVIEW

Human societies at all levels of complexity are linked to the natural environment. This relationship can best be understood as the differential use of available resources, coupled with the strategies employed for exploitation of those resources. Environmental parameters that help define settlement and subsistence options include climate, vegetation, soils, and geomorphologic setting; these factors also have a major impact on preservation. The following section provides an overview of the environmental setting of the project area.

3.1 Environmental Setting

3.1.1 Physiography, Geomorphology, and Drainage

Boone County is located within the Outer Bluegrass Physiographic Region (Forsythe and Jacobs 1986; Pollack 2008). This portion of Kentucky is characterized by rolling hills, gently dipping sedimentary rocks (mostly limestones, sandstones and shales), and deeply incised, dendritic drainage patterns of Ohio River tributaries (Linney 1885; McGrain 1983). The survey corridor is drained by the ephemeral headwaters of Gunpowder Creek, which flows to the Ohio River.

The bedrock geology of the county is Ordovician (McGrain 1983; Kentucky Geological Survey 2014). Limestone, sandstone and glacially transported cobbles can all be obtained where they have been exposed in stream beds at the bases of ravines (Wagner and Hopgood 1979).

3.1.2 Soils

The soils mapped within the project area belong to the Rossmoyne-Jessup association (Weisenberger et al. 1989). These soils formed in glacial till and loess and are associated with nearly level to moderately steep topography on ridgetops and side slopes of the glaciated uplands. The Rossmoyne soil series are deep and moderately well drained with a fragipan. The upper layers formed in loess, while the lower layers are formed in loamy and clayey calcareous glacial till. They are typically located on broad, glaciated ridges. Jessup series soils are deep and well drained, with the upper layers formed in loess and the lower layers formed in glacial till. Jessup soils are located on narrow ridges and hillsides.

Specific soils identified in the current project areas are provided in Tables 1 and 2.

Table 1. Soils in Areas 3-A and 3-B.			
Soil Type	Soil Symbol	Acres in Project Area	Percent of Project Area
Avonsburg silt loam, 0 to 4 percent slope	Av	4.5	5.1%
Avonburg silt loam, 0-4 percent slopes	Av	4.1	5.1%
Jessup silt loam, 12 to 20 percent slopes	JeD	10.1	12.6%
Jessup silty clay loam , 12 to 20 percent slopes, severely eroded	JsD3	0.9	1.1%
Rossmoyne silt loam, 0 to 6 percent slopes	RsB	40.5	50.7%
Rossmoyne silt loam, 6 to 12 percent slopes	RsC	24.4	30.5%
		80.0	100.0%

Table 2. Soils in Areas 6-A, 6-B, and 6-C.			
Soil Type	Soil Symbol	Acres in Project Area	Percent of Project Area
Ashton silt loam, 2 to 6 percent slopes (occasionally flooded)	AsB	2.1	2.0%
Jessup silt loam, 12 to 20 percent slope	JeD	38.0	36.4%
Jessup silty clay loam , 12 to 20 percent slopes, severely eroded	JsD3	2.7	2.6%
Lindside silt loam, 0 to 3 percent slopes (occasionally flooded)	Ln	2.8	2.7%
Rossmoyne silt loam, 0 to 6 percent slopes	RsB	30.3	29.0%
Rossmoyne silt loam, 6 to 12 percent slopes	RsC	28.5	27.3%
		104.4	100.0%

3.1.3 Climate

The climate of the project area is temperate and humid with an average annual precipitation of 102 cm (40 in.), distributed fairly well throughout the year. The average January temperature is 33 degrees Fahrenheit, and the average July temperature is 76 degrees Fahrenheit. The growing season has an average length of 186 days from the last freeze in the spring to the first freeze in the fall (Weisenberger et al. 1989).

3.1.4 Flora and Fauna

Prior to the extensive land clearing undertaken during Euro American settlement of the area, the dominant forest type was the Western Mesophytic Forest (Braun 1950). Forests of this type would have included oak-hickory, mixed mesophytic, and swamp vegetation, depending on local conditions such as bedrock, drainage, and aspect. Tree species such as hickory, walnut, hackberry, maple, chestnut, and oak, are typically associated with such a composition. Many of these tree species, especially oak, hickory, and black walnut, produce edible nuts that were heavily exploited by prehistoric/precontact Native Americans.

Game animals that would have been available to precontact Native American inhabitants include bear, elk, deer, and bison. Smaller species that could have been exploited include opossum, raccoon, turkey, fox, groundhog, and others. Because of the proximity of the Ohio River, a variety of fish and mollusk species would have been available as well. Overall, the variety of floral and faunal resources seasonally available in these forests are capable of supplying a wide range of needs, including foods, medicines, and raw materials.

3.2 Cultural Overview of the Study Area

The following section provides a brief, region-wide overview of the prehistoric and historic cultural sequences in which the project area is located. A more detailed cultural context has been provided elsewhere (Lewis 1996; Pollack 1990) and will not be repeated herein. The following information provides a context by which newly discovered archaeological sites can be evaluated as to their potential significance regarding Kentucky's past.

3.2.1 Pre-Clovis Occupations (40,000 (?) to 10,000 B.C.)

Evidence for the peopling of the Americas prior to 10,000 B.C. traditionally has been limited and debatable. Many sites originally proposed as "pre-Clovis" in origin (e.g., Pedra Furada and Pendejo Cave) were later dismissed upon closer inspection (e.g., Meltzer 1988). Other sites, such as the Meadowcroft Rockshelter in western Pennsylvania, which produced materials supposedly dating back as far as 17,000 B.C. in Stratum IIa (e.g., Carr and Adovasio 2002), have not been universally accepted.

Recently discovered sites, and reanalysis of several sites, have lent new support for the pre-Clovis paradigm, however. Most specifically, an examination of materials at the Monte Verde Site in northern Chile (Dillehay 1989, 1997). A consortium of archaeologists of variable opinions, reached a consensus that the MV-II occupational levels dating to 12,500 B.P. (1000 years earlier than Clovis) were indeed valid and represented the earliest, well-documented

occupation in the Americas (Meltzer et al. 1997). On-going investigations at several other North American sites, such as Cactus Hill in southwest Virginia (McAvoy and McAvoy 1997), the Debra L. Friedkin site in Texas (Waters et al. 2011), and the Topper Site in South Carolina (Goodyear et al. 1999) have provided additional support for the pre-Clovis paradigm. At Topper, for example, archaeologists have identified intact deposits a full meter below Clovis-aged material.

Although several pre-Clovis sites are now known across the Americas, analysis of these assemblages have revealed little consensus on what constitutes a “typical” pre-Clovis tool kit. At the very least, the utilization of small, prismatic blades, usually of high-quality cherts, appears commonplace at most of these sites (see Carr and Adovasio 2002:8-11). Currently, no evidence of pre-Clovis occupation within the Commonwealth of Kentucky has been identified.

3.2.2 Paleoindian Period (12,000 to 8000 B.C.)

The earliest known human habitation in the study area is referred to as the Paleoindian period. The Paleoindian way of life primarily consisted of small, highly mobile bands of hunter-gatherers that moved seasonally across the landscape in search of animal and plant resources. Although mega-fauna, such as Mastodons, were likely exploited to some degree by Paleoindian hunters, current evidence suggests that Paleoindian diets were more generalized and consisted of a range of plant foods and smaller game animals such as elk, white-tailed deer, and rabbit (among others) (Fitting 1965:103-4; Grayson and Meltzer 2002; Ritchie and Funk 1973:336).

The most common diagnostic artifact recovered from sites associated with this temporal period is the Clovis projectile point. The Clovis point type is a fluted lanceolate with parallel or slightly convex sides and concave base. Grinding of the base and lateral edges for hafting is readily apparent (Justice 1987). This particular point type is found throughout the majority of North America. Projectile point types diagnostic of this time period, but more localized to the southeastern United States, include the Cumberland Cluster and the Hardaway-Dalton Cluster (Justice 1987). Other items found in the Paleoindian toolkit include steep-edged scrapers, blades, utilized flakes, and tools made of organic materials. Due to their extreme antiquity, items manufactured from bone, wood, and antler are seldom preserved from this period. Paleoindian skeletal remains are also only rarely recovered. Evidence for cremation at the Crowfield Site, located in southern Ontario, indicated some form of ceremonialism among Paleoindian groups (Deller and Ellis 1984).

The lithic resources utilized during this period centered on high-quality chert types. Traveling extreme distances to acquire these desired materials was not uncommon (Tankersley 1985). Aesthetic properties, as well as knapping characteristics, appear to have been important in the selection of raw materials (Haynes 1980:116). In Kentucky, at least one such source is known to have been exploited by Paleoindians. This source, a high-quality chert from the Blue River group, is located in Christian County. Two quarry sites, the Adams and Ledford sites, have been identified here, each with a broad spectrum of reduction and tool manufacture debris (Sanders and Maynard 1979).

The majority of Paleoindian site types consist of single or multi-episode base/extractive camps and isolated artifact locations. Most are located in topographic positions with strategic value in exploiting game resources, such as high ground adjacent to water sources. Upland sites are rare; however, some rockshelters contain evidence of occupations from this period, and quarry/reductive camps may be found near sources of high-quality lithic materials. Occupations were of short duration, leaving only low density archaeological sites.

Over 200 Paleoindian sites have been recorded for Kentucky, but only eight come from the Northern Bluegrass Section that includes Boone County (Pollack 1990). Six of the eight sites are located in Boone County and five of those are in the Big Bone Lick region. The unique paleoenvironment of the saline Big Bone Lick attracted a diverse assemblage of mega-fauna and evidence suggests that Paleoindians hunted these large herbivores by circa 8550 B.C.

3.2.3 Archaic Period (8000 to 1000 B.C.)

The end of the Pleistocene and transition into the Holocene was characterized by warming temperatures, the retreat of the glaciers, and a subsequent rise in sea levels. These changes also brought about a shift in surface vegetation. The higher, cooler altitudes retained their earlier floral communities, while the lower altitudes experienced immigration of species previously found in more southern latitudes. Thus, a greater variety of plant food resources became available. However, this also led to the out-migration of open area-adapted game animals, which followed the retreating glacial climate northward. These were replaced by the forest and margin-adapted species that characterized the region up until historic times.

Peoples of the Early Archaic period (8000 to 6000 B.C.) continued the basic subsistence practices of the previous period, although modified for the changing environmental conditions. There is evidence for increasingly specialized resource procurement activities, as well as specialization in tool technology. The apparent variety of site types and activities represented during this period reflect an adaptation to an increased variety of environmental settings and indications that plant foods were becoming a more substantial part of the diet (Jeffries 2008).

The broadened Holocene subsistence base and technology provided a seasonally transient subsistence economy with larger base camps along the major stream systems and smaller, short-term camps on the minor streams and upland ridges. Base camps typically were situated at the confluence of a major stream and tributary, or on broad stretches of land protruding out above a floodplain or marsh. These settings offered the greatest variety and quantity of exploitable resources within the smallest land area. This can be further illustrated by Kavanaugh's (1983) work in the Monocacy River Region of the Maryland Piedmont, where the majority of Early Archaic sites were found to be clustered on river terraces and hill slopes within close proximity to rivers. To explain this clustering in the riverine environment, Kavanaugh cites the low carrying capacity of the emerging boreal forests, and concludes that the river afforded the most productive region for hunting and gathering activities (Kavanaugh 1983). The continuing absence of midden deposits, features, and burials at Early Archaic sites in Kentucky, suggests that most occupations were on a short-term basis (Jefferies 1990:151).

The fluted points of the Paleoindian period were replaced with smaller projectile points that were notched or stemmed to facilitate hafting, and blades that often exhibited serrated edges.

These technological changes reflect the development of new adaptive/hunting strategies that were oriented to the exploitation of smaller game animals. Diagnostic points of the Early Archaic include Kirk Stemmed and Notched (Coe 1964), Palmer Corner-Notched, and several small bifurcated-base types, such as the LeCroy, MacCorkle, St. Albans, and Kanawha (Broyles 1971). Although the preference for high-quality lithic resources characteristic of the Paleoindian period persisted, the Early Archaic also marked the introduction of a much wider variety of lithic materials.

This period also witnessed the introduction of ground stone tool technology, necessary for the exploitation of a woodland environment. The addition of plant food processing implements, such as mortars, pestles, and nutting stones, indicates the increasing importance of plant resources.

Although sites from the Early Archaic period remain rare, there is an increase in their occurrence over that of Paleoindian sites. This is evidence of gradual and general population increase, which becomes apparent during the Early Archaic period and continues throughout prehistory.

With the beginning of the Middle Archaic period, approximately 6000 B.C., the continued climatic changes produced forest conditions approaching modern vegetation communities, thereby providing an unprecedented variety of floral and faunal resources. Exploitation of these increased resources co-occurred with increased human populations, as well as with an increasing diversity in regional adaptation strategies.

In the very earliest portion of the Middle Archaic period, the various bifurcate points introduced during the Early Archaic persist. Projectile point types begin to show regional variation (Jefferies 1990). A variety of stemmed and side-notched points were being manufactured during this time, including Stanly Stemmed, Morrow Mountain I and II, Guilford Lanceolate, Matanzas, and Big Sandy (Justice 1987). Locally available cherts formed an increasingly large percentage of the tools manufactured during the Archaic period. An increase in ground stone tools during the period, especially grinding stones, seems to indicate an increased reliance on seasonally available nuts and seeds by the Middle Archaic populations.

The population growth that began during the Early Archaic endured through the Late Archaic (4000-1000 B.C.). Groups became more sedentary as their reliance on seasonally abundant floral resources increased. These groups also became more reliant on fishing and other riverine resources, as evidenced by the appearance of steatite netsinkers at many Late Archaic sites. During the Archaic period, and particularly evident in the Late Archaic, a hierarchical series of site types formed. The largest sites are the base camps, focused on the seasonally abundant food resources noted above. These are usually in floodplain/terrace situations, and can include extensive midden deposits, numerous features, and a wide range of material remains. Such sites were apparently related to repeated and prolonged occupancy, by comparatively large social groups.

A variety of projectile point styles are diagnostic of this particular temporal period in Kentucky. Point types associated with the Late Archaic in Kentucky include Ledbetter,

Merom-Trimble, along with other stemmed and corner-notched point styles (Jefferies 1990). Also during this period, the distinctive broad-bladed projectile points and knives belonging to a complex known as "Savannah River" are found (Coe 1964:123-124). Points, and the wide range of other tools found on these sites, such as bifaces, scrapers, and drills, are generally made of locally available lithic materials, even those of poor quality. The differential occurrence and use of more exotic raw materials may provide information on exchange, and/or the limits of territorial exploitation. Also associated with this tradition are polished atlatl weights and grooved axes.

The most significant technological advance of the Late Archaic period is the development of pottery and the beginning of plant cultivation. Late Archaic groups began to experiment with container technology by carving pots/bowls out of stone materials such as steatite. The steatite bowls from this period form a minor, but integral part of the Late Archaic artifact assemblage in the Middle Atlantic and Northeast cultural areas. The beginnings of ceramic technology also have been traced to the Late Archaic period, although less here than elsewhere in the eastern and southeastern states. Clay-based pottery has been dated possibly as early as 1800 B.C. in the Ohio Valley (Seeman 1986:566).

Recent research in the Ohio Valley, and in the Cumberland Escarpment region of Kentucky, is demonstrating that Late Archaic groups began to experiment with horticulture during the Late Archaic period. Gremillion (1998), for example, has demonstrated that Late Archaic groups cultivated squash, chenopod, sunflower, sumpweed, maygrass, knotweed, and several native plant species. Nut resources (nut, hickory, black walnut) also played a key dietary role.

A total of sixty-seven Archaic period sites are known for the Northern Bluegrass Section of Kentucky (Pollack 1990:198). Several small Early Archaic sites have been identified within the Greater Cincinnati International Airport and appear to represent the prehistoric activity for upland environments in the general vicinity of the Ohio River. Middle and Late Archaic sites have been less frequently identified (Sussenbach 1986 in Pollack 1990:198). Also within Boone County, the Glacken Site (15Be272) located near Big Bone Lick has revealed a significant quantity of Late Archaic cultural material, midden, and pit features (Pollack 1990:199). Analysis suggests a fall and winter occupation of the site. Within the 2-km (1.2 mi.) radius study area of the Project Areas, five sites with Archaic Period components were identified (15Be315, 15Be316, 15Be324, 15Be325, and 15Be336); however, none of these sites are located directly within the project area.

3.2.4 Woodland Period (1000 B.C. to A.D. 1000)

Although ceramics are now known to have originated at some point during the Late Archaic period, the widespread use of pottery is generally considered to mark the beginning of the Early Woodland period. It has been suggested (Seeman 1986:564) that pottery is no more than a convenient marker for archaeologists to distinguish between cultural periods, and has no direct significance in marking new subsistence settlement patterns. Munson (1976) argues that the first pottery represented an important technological innovation in food processing. However, a consideration of the extreme scarcity of ceramic remains from the long, initial period of its introduction is strong evidence that the presence of ceramics does not imply the wholesale adoption of a new subsistence system (Brown 1985). Although arguments can be made

concerning the implications of pottery's introduction into the archaeological record, the fact remains that at the inventory level, its use as an arbitrary horizon marker is a convenient way to identify Early Woodland occupations. The pottery type most diagnostic of this time period in Kentucky is Fayette Thick (Griffin 1943). Recent research in northern Kentucky at the West Runway Site (15Be391: Bergman et al. 1998) provides some of the best information regarding the earliest ceramic-producing Early Woodland (pre-Adena) cultures. Importantly, this pre-Adena site was characterized by a co-association of Kramer projectile points and Fayette Thick ceramics as early as 770 B.C.

There is evidence that the Early Woodland diet was supplemented by various native and non-native cultigens, like sunflower, chenopod, squash, and an assortment of starchy seed plants. This practice had its origin at some point during the Archaic period, but during the Early Woodland horticulture began to increase in its importance to subsistence, a trend that continued throughout the Woodland period (Cowan et al. 1981; Gremillion 1998; Yarnell 1976).

The Early Woodland period appears to represent a cultural expansion of the Late Archaic. It is characterized by a greater tendency toward territorial permanence, and an increasing elaboration of ceremonial exchange and mortuary rituals. However, some of these traits, once believed to be indicative of Early Woodland, are now known to have their origins in the Archaic (Dragoo 1976; Griffin 1967). The settlement pattern of this period also varies little from that of the Late Archaic period; established base camps vs. outlying extractive camps. The utilization of rockshelter and open upland sites for the latter type continues. This period also saw the introduction of additional site types. Earthworks and mounds appeared, both in association with, and isolated from, habitation sites. These often were related to mortuary practices, although non-burial, so-called ceremonial sites, also were present.

In the Central Ohio Valley, an important Early Woodland manifestation is referred to as Adena, although true Adena traits do not appear in the record until circa 500 B.C. (Railey 1996:91). This particular cultural manifestation is identified by the occurrence of Adena-type projectile points, and Adena Plain and Montgomery Incised pottery (Haag 1940). The Adena people occupied semi-permanent village sites and constructed earthworks such as conical mounds for interment. Adena burial mounds are typically small, and are usually located on high terraces or bluffs overlooking major stream valleys. Adena habitation sites, on the other hand, are usually small villages or hamlets located along low terraces and in the floodplains of stream valleys.

Relatively few Early Woodland sites have been identified within the Northern Bluegrass Section, although numerous sites have been located and investigated north of the Ohio River. Cultural material recovered from these sites, such as thick, plain ceramics, and contracting and rectangular stemmed points, may be expected at contemporaneous sites in Northern Kentucky (Pollack 1990:302).

The Middle Woodland period (200 B.C. to A.D. 500) is characterized as a time of complex socio-cultural integration across regional boundaries, via networks of trade. The original purpose of the Middle division of Woodland was to encompass the phenomenon known as Hopewell, although many Kentucky archaeologists also associate Adena cultural complexes

within the Middle Woodland period (e.g., Railey 1996). The characteristics included in this complex of traits include elaborate geometric earthworks, enclosures, burial mounds, and mortuary practices involving an array of exotic and ceremonial goods.

The settlement pattern common to the Middle Woodland period is more hierarchically ordered than in earlier periods. The central element of this system is the hamlet, more established and larger than the base locales or camps of earlier periods. These are found concentrated in the larger stream valleys, where level, well-drained land lies adjacent to permanent, flowing streams (Asch and Asch 1979:83). Regular intervals between such sites, and their relationships to mound earthwork complexes, have led Struever and Houart (1972), among others, to speculate on their central position in interregional exchange networks. Mortuary sites occur both adjacent to and separate from these larger occupations. In cases where mounds or cemeteries occur in isolation, there are frequently ephemeral camps associated with them, probably related to the complex mortuary activities.

The remainder of the settlement system consists of small, more-or-less permanent residential hamlets, and very small, special purpose extractive camps. These ancillary sites are generally located within a fairly limited territory, peripheral to the medially located villages. These camps are found in bottomland, upland open settings and rockshelters, and other areas where quantities of select resources are available for seasonal exploitation. The pattern of exploitation used was that of logistically organized collection parties, rather than wholesale relocation of populations away from the primary habitation site.

Middle Woodland subsistence was essentially an elaboration of the same system developed through the Late Archaic and Early Woodland periods. The Middle Woodland diet included acorns, hickory and walnut; fleshy fruits, seeds; and deer, small mammals, fish, and shellfish. The most evident alteration from earlier periods in this diet is the substantial increase in use of seed foods. The indigenous seed complex is much more heavily utilized, although regional variations in species choice persist. Maize occurs in its earliest well-documented contexts in the Middle Woodland, although never in sufficient amounts to comprise a significant portion of the diet.

In the Northern Bluegrass Section of Kentucky, Middle Woodland sites are represented by several village sites, burial mounds, and other mortuary sites. Within Boone County, significant Middle Woodland sites include the Gaines Mound (15Be23), Robbins Mound (15Be3 and 15Be14) and Riley Mound (15Be15). Open habitation sites have also been identified in the county, such as 15Be61 and the Rogers Site (15Be33-35), which also includes a mound (Pollack 1990:310).

Throughout the Midwest, during the Late Woodland period (A.D. 500 to 1000), there appears to be a breakdown of the Hopewell Interaction Sphere and a decrease in related mortuary ceremonialism. To date, there is no convincing indication of cultural disintegration, invasion, or population replacement, as was once thought (Pollack and Henderson 2000). There does appear to have been an increasingly intensive reliance on maize agriculture, with a concomitant increase in population concentration, and more substantial villages. Local cultural groups are distinguished by subtle variants of projectile point and ceramic styles, which may be due, in

part, to the trend change from seasonal village occupations to more stable year-round habitations (Brose 1985). It is probable that established patterns existed longer in some areas than in others, as a continuation of the Middle Woodland economy, with the noticeable lack of elaborate Hopewell ceremonialism. By the end of this period, the adoption of corn, bean and squash agriculture is evident. Permanent villages were situated along terrace and bluff base locations within the major river valleys.

The utilization of both upland and bottomland sites for habitation during the Late Woodland period is suggestive of the dichotomous settlement system documented for early historical groups in the Plains and northeast United States (Roper 1979:139-141). This system is composed of two distinct types of sites occupied on a seasonally interchangeable basis. During the summer, a base camp or village is established with house structures and cultivated fields reoccupied from year to year. After the harvest, these sites would be temporarily abandoned for hunting camps in the nearby forests. Again, use of upland open sites and rockshelters persists through this period.

For Northern Kentucky, the most prominent Late Woodland cultural complex is the Newtown Phase, which dates between ca. A.D. 300 to 800 (Seeman 1980, 1992; Railey 1996). Major excavations at Late Woodland sites have included Pyles (Railey 1984), Grayson (Ledbetter and O'Steen 1992), Gillespie (Railey 1985), Bentley (Ahler 1987), and Hansen (Henderson and Pollack 1985), among others. During this time, Native groups occupied large, circular villages with multiple features including house structures. Villages tended to have centrally located communal areas. These settlements indicate a trend towards population nucleation beginning as early as A.D. 300 in the Ohio Valley. Evidence of full-blown agriculture, supplemented by hunting and wild plant collection, is found in storage and cooking pits at Newtown sites. At Hansen, for example, inhabitants grew a variety of plant foods in garden plots, including squash, marsh elder, chenopod, knotweed, and maygrass. Late Woodland sites have not been abundantly located in Northern Kentucky or Boone County. The Rogers Site (15Be33-35) is located on the Ohio River Floodplain and included two village midden stains. Cultural material from the site has not been analyzed, but radiometric dating indicates a Late Woodland component. Within the 2-km (1.2 mi.) radius study area of the project area, two sites with Woodland Period components were identified (15Be323 and 15Be325); however, these sites are not located directly within the project area.

3.2.5 Late Prehistoric/Fort Ancient Period (A.D. 1000 to 1750)

The Late Prehistoric cultural sequence, as it developed in the central Mississippi Valley and spread across the southeastern United States, has been described as a period of Mesoamerican-influenced cultural complexity, built on a very effective agricultural subsistence base. Although classic "Mississippian" sites do not occur in north central Kentucky, a related phenomenon referred to as Fort Ancient did occur there at this time. The most diagnostic materials associated with this particular culture are a series of shell-tempered ceramic types, including plain, cord-marked and knot-roughened wares. Diagnostic lithic tools are primarily represented by small triangular projectile points, although Fort Ancient assemblages also include a variety of other flaked stone tools. Additionally, bone and antler tools are quite prominent, as well as a variety of decorative items manufactured from organic materials (Sharp 1990).

Subsistence during this period became even more heavily dependent on maize, beans, and squash, while still based on the hunting of wild game, fishing, and the collection of wild plants (Sharp 1990). Populations increased in density and concentration, with increased sedentism and a shift to a more intensive agricultural base.

Fort Ancient villages were circular or elliptical in configuration, with residential structures surrounding a central plaza. Some villages were fortified, although this is not consistent. Most structures were small, rectangular houses, probably housing a single family unit. Numerous surface and pit features are included in such sites, including bell-shaped storage pits and burials. The majority of these villages were located in proximity to either major drainages or historically documented aboriginal trail systems, but were not restricted to floodplain locales (Sharp and Turnbow 1987; Turnbow 1985). Hamlets and small settlements persisted; however, they were no longer the primary settlement unit. Extractive camps scattered across the landscape can also be attributed to this period.

A chronology of Fort Ancient investigations has not been well established for the Northern Bluegrass Section of Kentucky. Research in adjacent sections has established that during the Middle Fort Ancient (A.D. 1200-1400), populations began to coalesce into more compact settlements. Many sites exhibit a circular midden ring around a central plaza. Circular villages vary in size from 125 to 180 m (410 to 590 ft.) in diameter, or an area of 1.2 to 2.3 ha (3 to 5.7 ac.). There was apparently a shift toward mortuary practices occurring within or near living areas. There was an increase in the frequency of shell-tempered pottery, and in the frequency of non-local lithic raw materials, suggesting increased interregional trade. Indigenous populations were heavily dependent on agricultural products, especially corn and beans (Rossen 1992). Wild plant seeds and nuts also accounted for a portion of the diet. A wide range of game animals was exploited, including white-tailed deer, elk, raccoon, black bear, and several others.

The transition from Middle to Late Fort Ancient is represented by the Madisonville Horizon. This horizon represents a pan-regional organization of Fort Ancient societies into similar lifeways and material culture. Madisonville Horizon traits begin to appear circa A.D. 1450 in the Central Ohio Valley. Madisonville Horizon ceramic types, including Madisonville Plain and Cordmarked, are found throughout the Central Ohio Valley during this time. Increased use of local materials, such as marine shell, suggests that Late Fort Ancient groups were participating in broader trade networks (Henderson 1992; Sharp 1990).

Important sites in north-central Kentucky include the Cleek-McCabe (15Be8, 15Be22 and 15Be23) that was first excavated under the auspices of the Work Progress Administration (WPA) in 1939. The site includes two low burial mounds and a village midden with a central plaza. Pottery sherds recovered from the site are similar to Anderson Cordmarked and Anderson Incised. The Arrasmith Site (15Be36) is a village with central plaza located on the Gunpowder Creek Valley. The Petersburg Site (15Be6) is a large village and cemetery situated on the floodplain terraces of the Ohio River in the town of Petersburg. Generally, cultural material recovered from Fort Ancient sites in counties bordering the Ohio River in north-central Kentucky are similar to Fort Ancient sites in southwestern Ohio.

The earliest Euro-American entrants into eastern Kentucky came by way of a heavily used and complex trail system. These trails followed both stream valleys and ridge crests. Early records of these trails are sparse and vague as to location. However, it is known that branches of the documented trails, such as what became the Wilderness Road, spread throughout the upland region. Native American camp sites of various sorts were reported all along these trails, including both short- and long-term occupations and camps related to the exploitation of local resources such as fauna, flora and lithic sources. Evidence of Native American/Euro-American interaction occurs at several Native American sites in the form of European goods.

3.2.6 Historic Period (A.D. 1750 to Present)

3.2.6.1 Regional Development

Following the Revolutionary War, the population of the Bluegrass Region of Kentucky increased four-fold to about 30,000 between 1782 and 1784. Settlers established farmsteads away from the stations and forts, and some of the stations became real towns, such as Georgetown, Danville, Stanford, and Lexington. Early settlers were mostly of English background, but many were Scottish, Scots-Irish, and German. Immigration also brought gentry from Virginia, Maryland, and North Carolina, and these people established large plantations incorporating slave labor. Tobacco, hemp, grains, and livestock were grown on both the small and large farms.

The economic boom of the 1810s led to a great deal of town speculation along the Ohio River. Only a few of these towns that got beyond paper planning survived once established. Covington and Newport were among the exceptions. By 1860, Covington and Newport were the second and third most populous cities in Kentucky, behind Louisville, all of which are on the Ohio River. Due to their locations on the river, and to the railroad connections to Lexington that had developed by 1860, it was in these cities that the most striking commercial, industrial, and demographic growth occurred in the Antebellum period (1820-1860). Industries such as iron foundries and glasshouses grew in importance, supplementing the processing of agricultural products as the primary industrial base.

The first substantial influx of German immigrants into the central Ohio Valley began in the 1840s. The Ohio River served as a cultural conduit, and Cincinnati emerged as a port of entry inland. Coupled with the political unrest in Germany in the 1840s, these factors led to a dramatic increase in the Ohio Valley German population.

The success of Cincinnati's Nicholas Longworth in viticulture led to the establishment of vineyards on hills bordering the Ohio Valley. By 1860, Kentucky was the nation's third largest producer of wine after Ohio and California. The wine-producing region followed the lines of rural German settlement, and many of the Germans were involved in tending vineyards and processing wine. Unfortunately, a devastating blight spread rapidly among the region's vineyards, leading to the virtual abandonment of the Ohio Valley wine industry by 1880. Subsequently, many of the area's farmers who had formerly been involved in wine production turned to root crops, vegetables, and orchard products.

3.2.6.2 Boone County

Boone County, the northernmost county in Kentucky, is bounded by the Ohio River on the north, Grant County on the south, Kenton County on the east, and Gallatin County on the west. The first Euro-American explorers to travel in Boone County were Frenchmen who arrived in 1729, though settlers from Fincastle County, Virginia, first surveyed the area in 1773. The county was part of Woodford County, Virginia until 1786, when Kentucky separated from Virginia. Originally part of Campbell County, Boone County was formed by an act of the Kentucky legislature in 1798 (Boone County Historical Society 1973; n.d.).

The county's first settlement occurred in 1789 when John Tanner, a Baptist preacher, led a group of settlers from Pennsylvania (Cabot and Rouse 1998). They founded Tanner's Station, now known as Petersburg, on the Ohio River. During the 1820s, '30s and '40s, many small towns were established throughout the county, including Burlington, Florence, Union, Verona and Walton. Burlington became the county seat, while the other towns served as centers for trade and commerce in the largely rural county.

Boone County's early settlers came down the Ohio River, many from Virginia, western Pennsylvania, and the Carolinas; others moved from central Kentucky, primarily Fayette and Woodford Counties. Ethnic settlement in the county included a large contingent of German immigrants who, in the early nineteenth century, moved from Virginia's Shenandoah Valley to settle near the communities now known as Hebron and Hopeful Heights (now part of Florence) in the northern part of the county. Also settling in the county in the mid-nineteenth century was a group of Irish Catholics, who established a community near what is now Verona. According to local history, the first shoemaker in Boone County, William Underhill, arrived in the area that became Taylorsport in 1790 and was commissioned by settler John H. Craig to cobble shoes for his 20 slaves (Caldwell 1957; Warner 1998:31). Even though Boone County was reputed to have had a fairly large slave population, Craig's amount seems disproportionately large (Warminski 1996:22). A small community of African-Americans was formed in north Walton following the Civil War.

The development and economic success of the county's towns at various points in its history is tied directly to historic transportation systems. In the early decades of the county's history, the river towns of Petersburg, Belleview, McVile, and Hamilton thrived as a result of river transportation; Petersburg was the county's largest town during this period (Conrad 1992). These communities began to diminish in importance in the late nineteenth century with the construction of rail lines in eastern Boone County, together with the concomitant decline in river traffic. For the first half of the twentieth century, the railroad town of Walton was the county's largest city. In the mid-twentieth century, as the car gained dominance and the interstate highway was built through Boone County, Florence became the largest city in the county ca. 1950.

Boone County grew steadily during its first few decades, with 1,534 residents in 1800 and 11,185 residents in 1850 (US Census n.d.). After peaking in 1890 with 12,246 residents, the population slowly declined through 1940, with a low of 9,420 residents in 1910 (US Census 1880). Since 1950 and the impact of both increased suburbanization and the development of the regional airport, the county's population has increased steadily and significantly, doubling

in size from 1940 to 1960, and doubling again by 1980. The 2000 census data shows a total population for the county of 85,991 (US Census 2000).

Agriculture has been the basis of Boone County's economy through most of its history, dominated by small, family-run, diversified farms averaging approximately 40.5 ha (100 ac.) (Warminski 1996:5). It is likely that the early settlers in the county were primarily subsistence farms, producing crops and goods for their own use. In the nineteenth century, improvements in transportation made it easier for farmers to sell their goods; as a result, farming moved away from subsistence and toward a market economy.

The most important cash crops in the county have been tobacco, corn, wheat, oats, and hay. Crops and livestock varied throughout the county based on topography. For example, the county's gently rolling countryside near Union and Richwood became home to the county's modest horse farming in the 1920-1930s, while the steep hillsides in the southern part of the county encouraged sheep farming through the late nineteenth century (Lutes 1955). The rich soil of the Ohio River floodplain in the northern part of the county makes fruit and vegetable growing profitable through the present day. Most farms also had livestock such as hogs, sheep, chickens, or cattle for sale. Dairy farming became a major industry in the county during the twentieth century. The county's produce and dairy products were sold locally, primarily in Cincinnati and Covington, while wheat and corn were processed as flour or whiskey for shipment to more distant markets (Boone County Historical Society 1973; n.d.).

Smaller farms of 50 acres or less depended on growing crops for sale and raising livestock for the family's consumption (Warminski 1996:68). These farms are likely to have one multipurpose barn, a corn crib, and an assortment of outbuildings. Farms of 50 to 100 acres produced both cash crops and livestock for sale, and tended to have more farm structures with specific uses, including one or more stock barns, a tobacco barn, one or two corn cribs, and a milk house and silo.

Tobacco had become an important crop in the county in the late nineteenth century, and remains so through the present. It was originally introduced by early settlers from the Carolinas and Virginia who found the area soils well suited to tobacco. In 1850, the county produced only 300,000 pounds of tobacco; in 1890, this number had increased twelvefold, to 3,600,000 (Verhoeff 1911). Tobacco remains the largest cash crop in Boone County. The importance of tobacco to Boone County's economy is underscored by the number of farm structures converted for use as tobacco drying barns.

Boone County remained primarily rural from its earliest settlement in the late eighteenth century until the decades immediately following World War II. Several forces combined to radically change the character of the county in the last half of the twentieth century. First was the 1947 creation of what is now known as the Greater Cincinnati-Northern Kentucky International Airport, followed closely in the late 1950s by the construction of Interstate 75 along the county's eastern edge (Tuttle and Jefferies 1986). The development of Florence Mall in the mid-1970s combined with these earlier forces to increase suburban development. By 1996, Boone County was the fastest growing county in Kentucky with the development of shopping centers, industries, corporate headquarters and residential subdivisions continuing

throughout the county. Many rural historical resources have been lost to this development, primarily in the eastern section of the county. Only the western river corridor, which is fairly isolated, remains primarily rural in character.

In terms of domestic architecture, the predominant building material throughout the county's history has been wood (Warminski 1996:7). High style examples of architecture are rare, especially in the rural parts of the county away from towns such as Burlington and Petersburg. There are few examples of Federal style buildings, and a proliferation of both Greek Revival and Italianate influenced houses. In the early twentieth century, American Foursquare, Homestead, and bungalow houses predominate with nearly 200 bungalows identified in the county (Warminski 1996:27). Numerous family cemeteries are found throughout the county, and Boone County has been an innovator in the creation of local legislation to protect small private cemeteries with a Cemetery Preservation Plan in place since the mid-1980s.

3.3 Summary of Regional Site Location Preferences

Kentucky site file research and analysis of published reports has revealed patterns of prehistoric and historical land use, settlement, and development. In general, the most important locational requirements of both prehistoric and historical habitation sites in north-central Kentucky were proximity to water, slope angle, availability of natural resources, and well-drained soils. Cartographic research also indicates the importance of a connection with an established road.

Many prehistoric groups favored living near the resource-abundant zones adjacent to large rivers. In addition, intensive Late Prehistoric period agricultural villages commonly were situated on wide, fertile bottomlands where agricultural pursuits were most productive. In areas where floodplains were too narrow or otherwise unsuitable for occupation, terraces and slope benches above the drainages sometimes were inhabited instead. Prehistoric sites also frequently clustered around stream confluences, further indicating a desire for living near waterways that provided ample resources and an adequately large infrastructure for travel, trade, and communication.

Large or long-term habitation sites, characterized by relatively dense depositions of artifacts and cultural debris, are less likely to occur on minor interior drainages. Ephemeral, low profile sites representing small, temporary, or seasonal occupations and procurement stations, however, are scattered across the uplands in moderate numbers; often these places served as ancillary camps for groups who lived on larger streams nearby. Upland exploitative, portage, and enroute encampments often were situated near rises between drainages.

4.0 PROJECT RESULTS

4.1 RESULTS OF LITERATURE REVIEW

Phase I investigations for the project began with consultation of archaeological literature and databases for information on the distribution and character of cultural resources in the region. This research was undertaken following guidelines issued by the Kentucky State Historic Preservation Office (Kentucky Heritage Council 2001).

A literature search was conducted to identify any cultural resources investigations that had taken place in the vicinity, to locate any previously recorded cultural resources within the project areas, and to provide information on the expected types and locational parameters of sites in the region. The literature search included a review of the NRHP, the Kentucky Archaeological Site Survey Forms, Individual Survey Forms, archaeological files and maps at the KHC and the KOSA, as well as Boone County atlases and histories.

4.1.1 Previously Recorded Cultural Resources Surveys

Interest in archaeological sites in Boone County goes back to the early nineteenth century (Rafinesque 1824) and continued through the nineteenth and early twentieth centuries (Collins 1874, 1882; Young 1910). Funkhauser and Webb's *Archaeological Survey of Kentucky* (1932), one of the seminal twentieth century works on Kentucky archaeology, listed 13 sites for Boone County (15Be1-15Be13).

A number of sites were excavated in the county under the auspices of the WPA from 1938-1941. Seven Adena mounds were excavated (15Be3, 15Be14-15, 15Be17, 15Be20, 15Be27, and 15Be32) (Webb 1943a, 1943b; Webb and Elliot 1942); a Fort Ancient mound (15Be8) and village site (15Be22) also were excavated (Rafferty 1974).

The Northern Kentucky Archaeological Society conducted investigations in Boone County during the 1950s, although their activities are not well reported. Robert Moody also recorded numerous sites in Boone County during this period, including mounds, village sites, and rockshelters (Fenwick and Weinland 1978).

Since the 1960s, several archaeological research projects have been conducted in Boone County, including investigations at Big Bone Lick and at the Arrasmith Site (15Be36). Big Bone Lick has been noted since the eighteenth century for the presence of the bones of extinct Pleistocene megafauna. The University of Nebraska conducted paleontological research there in the 1960s (Schultz 1963; Schultz et al. 1963). In 1976, the KHC undertook an archaeological reconnaissance survey of the Big Bone Lick State Park; however, the investigation failed to identify any sites. Investigations by James Hopgood of Northern Kentucky University documented the presence of two Fort Ancient sites within the park (Fenwick and Weinland 1978). The University of Kentucky Archaeological Field School surveyed three sites and excavated two of them within the park boundaries in 1982 (Boisvert 1982a, 1982b). Tankersley (1982) has focused research on Paleoindian period sites and materials at Big Bone Lick.

With the passage of Federal preservation laws since the late 1960s, many cultural resources investigations have documented numerous prehistoric and historical archaeological sites within Boone County. Of these investigations, 20 cultural resource surveys with coverage within the 2-km (1.2-mi.) radius study area have been undertaken since 1968 (Table 3, Figures 1 and 2). Although two of these surveys overlap some edges of Areas 6-A, 6-B, and 6-C, the majority of all five parcels (3-A, 3-B, 6-A, 6-B, and 6-C) have not been previously surveyed. A survey by Erickson and Crider (2010; SHPO ID 008-183) for the expansion of ZF Lenksysteme Campus and other commercial development projects overlaps Area 6-C on its northern, eastern, and western edges (Figure 2), but no archaeological sites were identified during this survey. A survey by Erickson (2011; SHPO ID 008-091) for a stormwater system upgrade overlaps Area 6-A on its southeast edge but again, no archaeological sites were identified during this survey.

Table 3. Previous Cultural Resources Surveys Within 2 km (1.2 mi.) of the Project Area.			
SHPO ID	Date	Author(s)	Title
008-009	1968	Rodeffer, Michael J.	<i>An Archaeological Survey and Preliminary Test Excavation: Interstate 275, Section 9, Boone, Campbell and Kenton Counties, Kentucky</i>
008-033	1982	Gray, Marlesa A.	<i>Cultural Resources Survey of 3.6 Miles of Sewer Line Corridor near Limaburg, Boone County, Kentucky</i>
008-037	1982	Gray, Marlesa A.	<i>Cultural Resource Reconnaissance of the Dilcrest and Hopeful Heights Sewer Line Corridors, Boone County, Kentucky</i>
008-040	1983	Broida, Mary O.	<i>A Cultural Resource Assessment of 12.4 Km (7.7 Miles) of Proposed Force Main/Sewer Lines in Boone and Kenton Counties, Kentucky</i>
008-041	1984	Schock, Jack M.	<i>A Cultural Reconnaissance of 6.8 Acres for the Proposed W.M. Smith Substation in Northeastern Boone County, Kentucky</i>
008-044	1985	Niquette, Charles M. and W. Kevin Pape	<i>A Phase I Archaeological Assessment of Borrow Areas for the Proposed Mineola Interchange Boone and Kenton Counties, Kentucky</i>
008-045	1985	Henderson, A. Gwynn	<i>Cultural Resource Assessment of Selected Areas Within and Adjacent to the Greater Cincinnati International Airport</i>
008-047	1986	Sussenbach, Tom	<i>A Cultural Resource Assessment of a Thirteen Acre Tract at the Greater Cincinnati International Airport</i>
008-048	1986	Sussenbach, Tom	<i>Cultural Resource Assessment of a Proposed New Runway at the Greater Cincinnati Airport</i>
008-051	1986	Tuttle, Elisabeth and Richard W. Jefferies	<i>Cultural Overview of Historic Period Occupation at the Greater Cincinnati International Airport, Boone Co. Kentucky</i>
008-052	1986	Sussenbach, Tom	<i>Cultural Resource Assessment of a 450 Acre Tract at the Greater Cincinnati International Airport, Boone County, Kentucky</i>
008-060	1987	Schock, Jack M.	<i>A Cultural Reconnaissance of Approximately 26 Acres for a Proposed Expansion of the Van Melle Project at Erlanger in Boone County, Kentucky</i>

Table 3. Previous Cultural Resources Surveys Within 2 km (1.2 mi.) of the Project Area.			
SHPO ID	Date	Author(s)	Title
008-069	1992	Corso, Robert A. and Joseph E. Wakeman	<i>Literature Review and Reconnaissance Survey of the Proposed Texas Eastern Products Pipeline Company Limited Partnership Pipeline in Whitewater and Miami Townships, Hamilton County, Ohio and Boone County, Kentucky</i>
008-091	2000	Clifford, Laura	<i>Phase I Cultural Resources Report for the Proposed Houston Commons Development in Florence, Boone County, Kentucky</i>
008-093	2001	French, Michael W., A. Gwynn Henderson, David Schatz	<i>An Inventory and Assessment of Prehistoric Mounds and Earthworks in Boone County, Kentucky</i>
008-104	2001	Breetzke, David	<i>Phase I Archaeological Survey for the New Delta Parking Facilities at the Cincinnati-Northern Kentucky International Airport in Boone County, Kentucky</i>
008-128	2004	Haney, Jennifer M.	<i>An Archaeological Survey of the Proposed Interchange at I 275/KY 20 in Boone County, Kentucky</i>
008-129	2005	Breetzke, David	<i>Abbreviated Phase I Archaeology Report, Gunpowder Creek Stormwater Treatment Facility Access Road, Burlington, Boone County, Kentucky</i>
008-132	2005	Kreinbrink, Jeannine	<i>Hopeful Lutheran Church, Florence, Boone County, Kentucky, Archaeology Project Final Report</i>
008-151	2007	Bybee, Alexandra D.	<i>An Archaeological Survey of the Proposed South Airfield Road, Boone County, Kentucky</i>
008-181	2010	Crider, Andrea and Luke W. Erickson	<i>Abbreviated Phase I Archaeology Report for the Kenton County Airport Proposed South Airfield Access Road Project, Burlington, Boone County, Kentucky</i>
008-183	2010	Erickson, Luke W. and Andrea Crider	<i>Abbreviated Phase I Archaeology Report for the Proposed Kenton County Airport Expansion of ZF Lenksysteme Campus and Separate Commercial Development Project, Burlington, Boone County, Kentucky</i>
008-184	2010	Stoll, Courtney	<i>Addendum Abbreviated Phase I Archaeology Report for the Kenton County Airport Proposed South Airfield Project, DHL Parking Area Expansion, Burlington, Boone County, Kentucky</i>
008-191	2011	Erickson, Luke	<i>Abbreviated Phase I Archaeology Report for the Proposed Kenton County Airport Stormwater Management System Upgrade Project, Boone County, Kentucky</i>

4.1.2 Previously Recorded Archaeological Resources

A search of the archaeological site database maintained by the KOSA identified a total of 55 previously inventoried sites within the 2-km (1.2-mi.) radius study area (Table 4, Figures 1 and 2). None of these 55 sites are located within the five parcels that constitute the current project area (Figures 1 and 2). The next two sections provide a brief discussion of known resources by temporal period.

Site Number	Temporal Affiliation	Site type	Landform	Area (m²)	NRHP Eligibility
15Be11	Middle Woodland-Adena	Earthen Mound	Dissected Uplands	100	Not Assessed
15Be263	Prehistoric	Open Habitation	Unknown	2983	Inventory Site
15Be264	Prehistoric	Open Habitation	UnDissected Uplands	2284	Inventory Site
15Be278	Prehistoric	Undetermined	Terrace	2912	Not Assessed
15Be279	Prehistoric	Undetermined	Terrace	3335	Not Assessed
15Be280	Middle Woodland	Undetermined	Terrace	3075	Not Assessed
15Be281	Prehistoric	Undetermined	Terrace	3530	Not Assessed
15Be282	Prehistoric	Undetermined	Terrace	3085	Not Assessed
15Be283	Prehistoric	Undetermined	Terrace	3135	Not Assessed
15Be284	Prehistoric	Undetermined	Dissected Uplands	10233	Not Assessed
15Be296	Historical (1851-1950)	Historic Farm/Residence	Dissected Uplands	5583	Inventory Site
15Be298	Historical (1851-1950)	Other	Dissected Uplands	2623	Not Assessed
15Be299	Historical (1851-1950)	Other	Dissected Uplands	2469	Not Assessed
15Be300	Prehistoric	Undetermined	Dissected Uplands	1720	Inventory Site
15Be301	Historical (1851-1950)	Historic Farm/Residence	Dissected Uplands	2166	Not Assessed
15Be302	Prehistoric	Undetermined	Dissected Uplands	3864	Inventory Site
15Be303	Prehistoric	Open Habitation	Dissected Uplands	5101	Inventory Site
15Be304	Prehistoric	Undetermined	Dissected Uplands	2354	Inventory Site

Table 4. Previously Recorded Archaeological Sites within 2 km (1.2 mi.) of the Project Area					
Site Number	Temporal Affiliation	Site type	Landform	Area (m²)	NRHP Eligibility
15Be305	Prehistoric	Open Habitation	Dissected Uplands	1844	Inventory Site
15Be306	Prehistoric	Open Habitation	Dissected Uplands	1602	Inventory Site
15Be307	Prehistoric	Open Habitation	Dissected Uplands	2175	Inventory Site
15Be308	Prehistoric	Open Habitation	Dissected Uplands	1646	Inventory Site
15Be309	Prehistoric	Open Habitation	Dissected Uplands	3970	Inventory Site
15Be310	Historical (1851-1950)	Historic Farm/Residence	Dissected Uplands	1566	Not Assessed
15Be311	Historical (1851-1950)	Historic Farm/Residence	Dissected Uplands	1796	Not Assessed
15Be313	Historical (1901-1950)	Undetermined	Dissected Uplands	445	Inventory Site
15Be314	Prehistoric	Undetermined	Dissected Uplands	1678	Inventory Site
15Be317	Prehistoric	Open Habitation	Dissected Uplands	496	Inventory Site
15Be318	Prehistoric	Undetermined	Dissected Uplands	410	Inventory Site
15Be319	Prehistoric	Open Habitation	Dissected Uplands	697	Inventory Site
15Be320	Prehistoric	Open Habitation	Dissected Uplands	1129	Not Assessed
15Be321	Prehistoric	Open Habitation	Dissected Uplands	693	Inventory Site
15Be322	Prehistoric	Undetermined	Dissected Uplands	1191	Inventory Site
15Be323	Woodland	Open Habitation	Dissected Uplands	1619	Not Assessed
15Be324	Middle Archaic	Open Habitation	Dissected Uplands	1840	Not Assessed
15Be325	Early & Late Archaic, Late Woodland/ Mississippian	Open Habitation	Dissected Uplands	4333	Not Assessed
15Be326	Prehistoric	Undetermined	Dissected Uplands	1020	Inventory Site
15Be327	Historical (1801-1850)	Historic Farm/Residence	Dissected Uplands	2773	Not Assessed
15Be328	Historical (1851-1950)	Historic Farm/Residence	Dissected Uplands	3626	Not Assessed

Table 4. Previously Recorded Archaeological Sites within 2 km (1.2 mi.) of the Project Area					
Site Number	Temporal Affiliation	Site type	Landform	Area (m²)	NRHP Eligibility
15Be329	Prehistoric	Open Habitation	Dissected Uplands	1471	Not Assessed
15Be330	Historical (1851-1950)	Historic Farm/ Residence	Dissected Uplands	2428	Not Assessed
15Be331	Historical (1851-1950)	Historic Farm/ Residence	Dissected Uplands	2428	Not Assessed
15Be332	Historical (1851-1950)	Historic Farm/ Residence	Dissected Uplands	960	Not Assessed
15Be333	Historical (1851-1950)	Historic Farm/ Residence	Dissected Uplands	2773	Not Assessed
15Be334	Historical (1901-1950)	Historic Farm/ Residence	Dissected Uplands	960	Not Assessed
15Be335	Prehistoric	Open Habitation	Dissected Uplands	1025	Inventory Site
15Be336	Early Archaic	Open Habitation	Dissected Uplands	772	Inventory Site
15Be337	Historical (1851-1950)	Historic Farm/ Residence	Dissected Uplands	693	Inventory Site
15Be338	Prehistoric	Open Habitation	Dissected Uplands	3453	Inventory Site
15Be339	Prehistoric	Open Habitation	Dissected Uplands	738	Inventory Site
15Be340	Prehistoric	Undetermined	Dissected Uplands	1005	Inventory Site
15Be549	Historical (1801-1950)	Historic Farm/ Residence	Dissected Uplands	4900	Inventory Site
15Be550	Prehistoric Historical (1801-1950)	Undetermined Historic Farm/ Residence	Dissected Uplands	5600	Inventory Site
15Be551	Prehistoric	Open Habitation	Dissected Uplands	100	Inventory Site
15Be557	Prehistoric	Other	Dissected Uplands	8116	Not Assessed

4.1.2.1 Prehistoric Resources

Prehistoric resources refer to archaeology sites dating between 12,000 B.C. and A.D. 1650. A total of 39 of the 55 previously recorded sites contained prehistoric components. Cultural periods represented by the 39 sites include Early Archaic (n=1), Middle Archaic (n=1), Middle Woodland/Adena (n=2), Woodland (n=1), multi-component Early Archaic to Mississippian (n=1), and Indeterminate Prehistoric (n=33). One of the Indeterminate Prehistoric sites (15Be550) also contained a historical component that will also be included in the tally of Historical Resources, below.

These resources represent the following site types: earthen mound (n=1), open habitation (n=20), undetermined (n=17), and other (n=1). Six of the sites with a prehistoric component are located on terraces, one site location is unknown, and the remainder of the sites (n=32) are located in dissected and undissected upland settings.

Twenty-five (64%) of the 39 prehistoric sites have been recorded as inventory sites that do not meet NRHP criteria; the remaining 14 sites were not assessed for NRHP eligibility. None of the 39 prehistoric sites found within the 2-km (1.2-mi.) radius study area have been determined or recommended as eligible for the NRHP.

4.1.2.2 Historical Resources

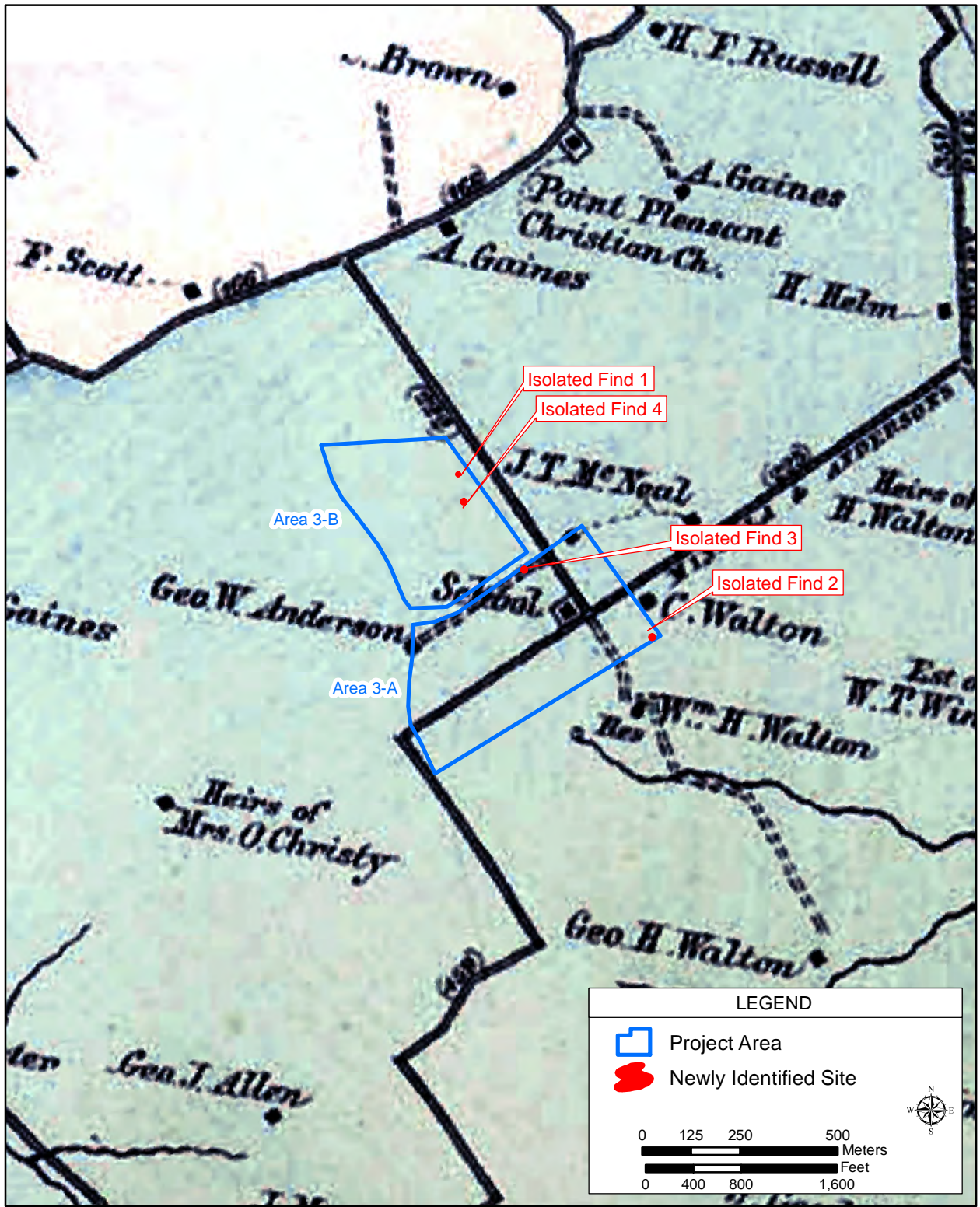
A total of 17 archaeological sites with historical components were identified within a 2-km (1.2-mi.) radius study area (Table 4, Figures 1 and 2). As stated in the *Prehistoric Resources* section, above, one of the historic sites also contained a prehistoric component. Of the 17 historical resources, 14 are classified as farm residences, two are classified as other, and one is undetermined. A majority of the resources (n=12) date to 1851-1950. The remaining resources were assigned the following dates: 1801-1850 (n=1), 1801-1950 (n=2), and 1901-1950 (n=2). Five of the sites (29%) have been classified as inventory sites that do not meet NRHP criteria; the remaining 12 sites were not assessed for NRHP eligibility. None of the 17 historic sites found within the 2-km (1.2 mi.) radius study area have been determined eligible for inclusion in the NRHP.

4.1.3 Cartographic Research

The project area is located within Boone County, Kentucky. This area was rural and supported scattered farmsteads during the nineteenth and early twentieth centuries. During the latter half of the twentieth century, the area experienced increased residential development. Historical maps were consulted to determine if any of the sites or disturbed areas identified during the current Phase I survey can be linked to previous activity. Historical maps showing the current project area include an 1883 map of Florence Precinct in Boone County (Lake 1883) (Figures 3 and 4) as well as 1914 (Figures 5 and 6), 1961 (Figures 7 and 8), and 1983 (Revised 1991) (Figures 9 and 10) USGS topographic quadrangles.

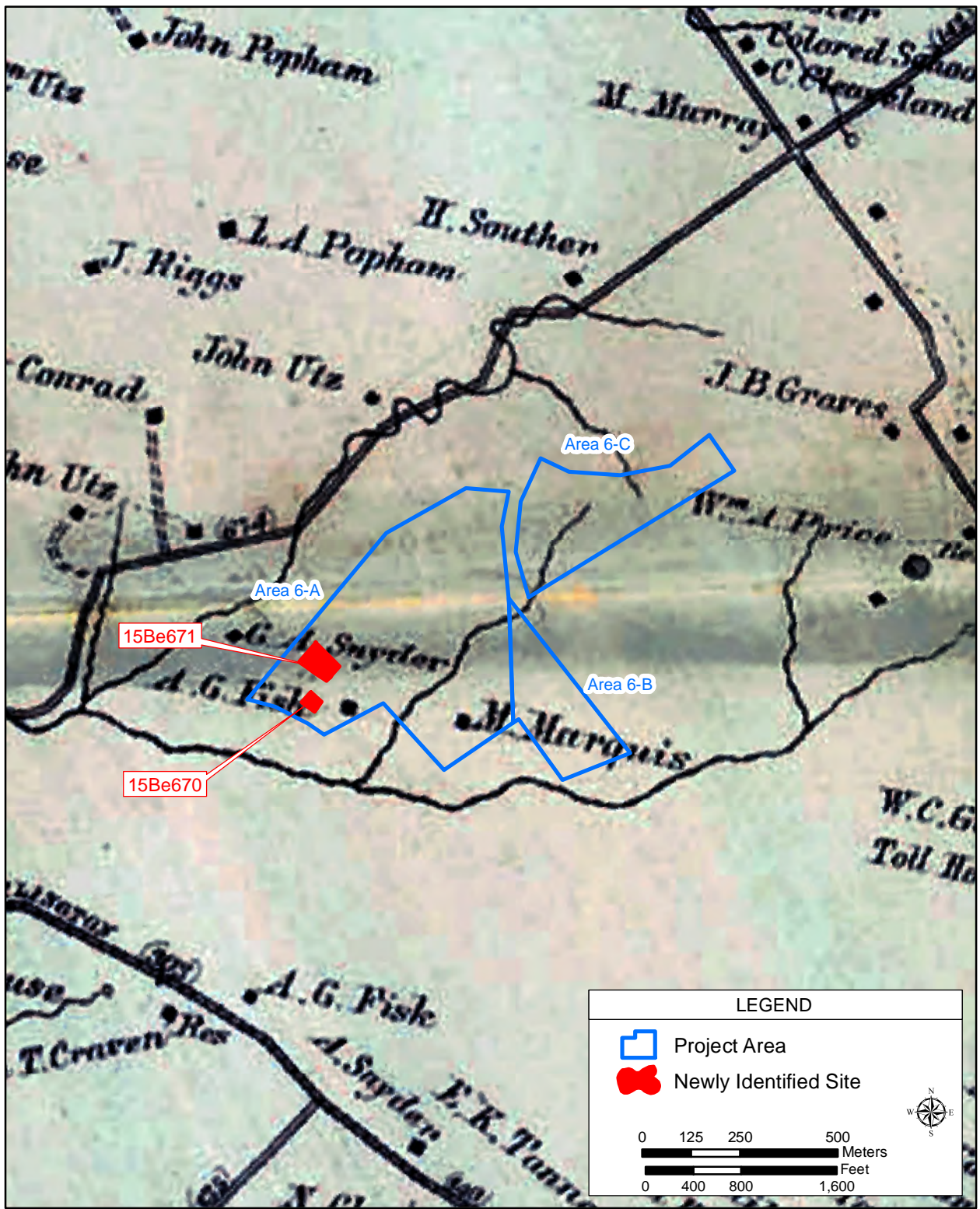
The 1883 map of Florence Precinct in Boone County, Kentucky (Lake 1883) (Figures 3 and 4) shows four structures associated with Area 3-A, but none associated with Area 3-B (Figure 3). More specifically, houses were located at (1) what is now the corner of Mineola Pike and Jamike Avenue, (2) what is now the corner of Mineola Pike and Donaldson Highway, and (3) just outside Area 3-A and within the Jamike Avenue roadway. The fourth structure was a school and it was located in the eastern third of the parcel. No artifacts were found in direct association with these 1883 structural locations within Area 3-A. Figure 4 shows two houses within Area 6-A. No structures are shown within the bounds of Areas 6-B or 6-C. The two houses within Area 6-A are in the southern portion of the parcel and although the A.G. Fisk household is located in the vicinity of sites 15Be670 and 15Be671, it is not in the exact location of either of these resources and a direct correlation between this structure and the identified resources cannot be confirmed.

FIGURE 3
REDACTED



Portion of the 1883
Map of Florence Precinct in Boone County, Kentucky
(Lake 1883), Showing the Location of Areas 3-A and 3-B

FIGURE 4
REDACTED



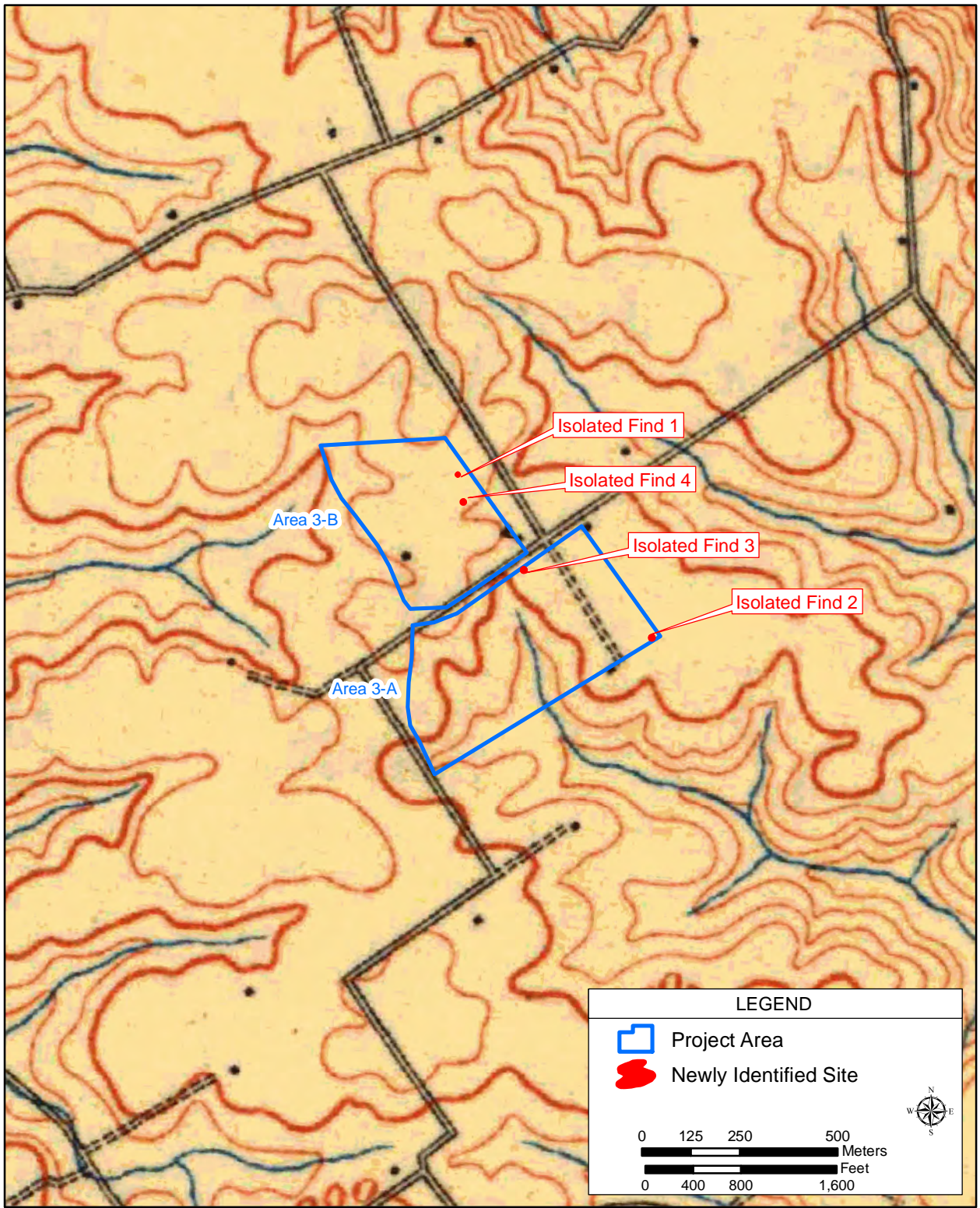
Portion of the 1883
Map of Florence Precinct in Boone County, Kentucky
(Lake 1883), Showing the Location of Areas 6-A, 6-B, and 6-C

The 1914 West Cincinnati, OH 15' USGS topographic quadrangle shows the project areas in relation to any structures present at that time (Figures 5 and 6). Figure 5 continues to show the house at what is now the corner of Mineola Pike and Jamike Avenue; however, all other structures previously located within Area 3-A are no longer extant. There are two houses shown within Area 3-B. Figure 6 shows no structures within Areas 6-A, 6-B, or 6-C.

The 1961 Burlington, KY 7.5' topographic quadrangle shows that much development has taken place in and adjacent to Area 3-B (Figure 7). A housing development lines the northeast boundary of Area 3-B along what is now called Delta Road and the houses continue along the northwestern side of Area 3-B along a road that is no longer extant. A house continues to be shown in the center of Area 3-B. There is a new structure in Area 3-A, which is located near the southern edge of the Area boundary. Figure 8 continues to show that no development has occurred within Areas 6-A, 6-B, and 6-C; however, a large housing subdivision is located directly adjacent to the southern boundary of Area 6-A.

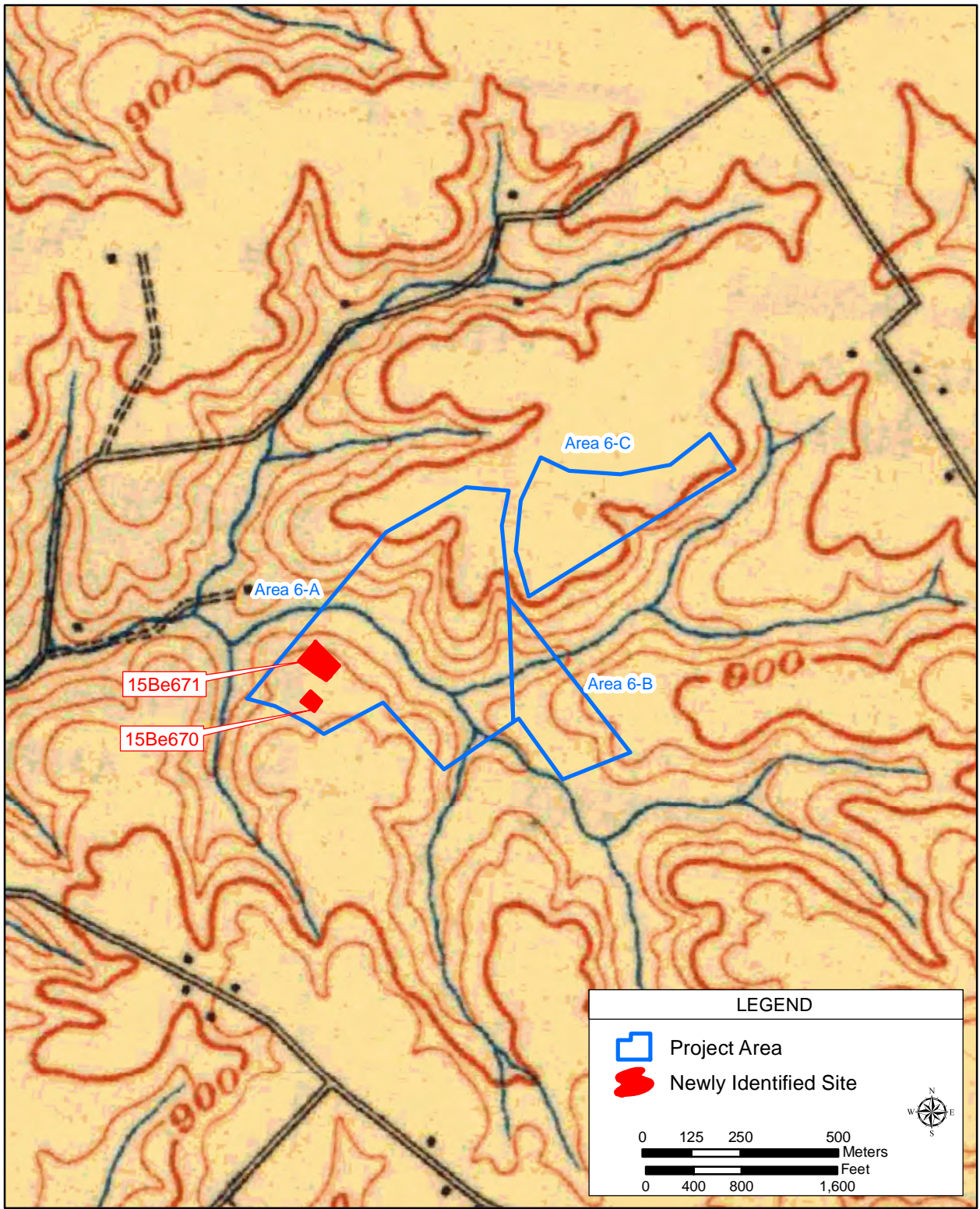
Finally, the 1983 (Revised 1991) Burlington, KY 7.5' USGS topographic quadrangle shows no structures within or near Area 3-B; the houses have been removed and the landscape graded to reflect the grassy field we see today (Figure 9). The structure shown on the 1961 map remains but is in a slightly different location. Whether this is indicative of two different structures over time or simply inaccurate mapping is unknown. Figure 10 shows that the subdivision to the south of Area 6-A remains and, indeed, is still there today. In addition, a trailer park has been developed on the western side of Area 6-A and it, too, is still there today.

FIGURE 5
REDACTED



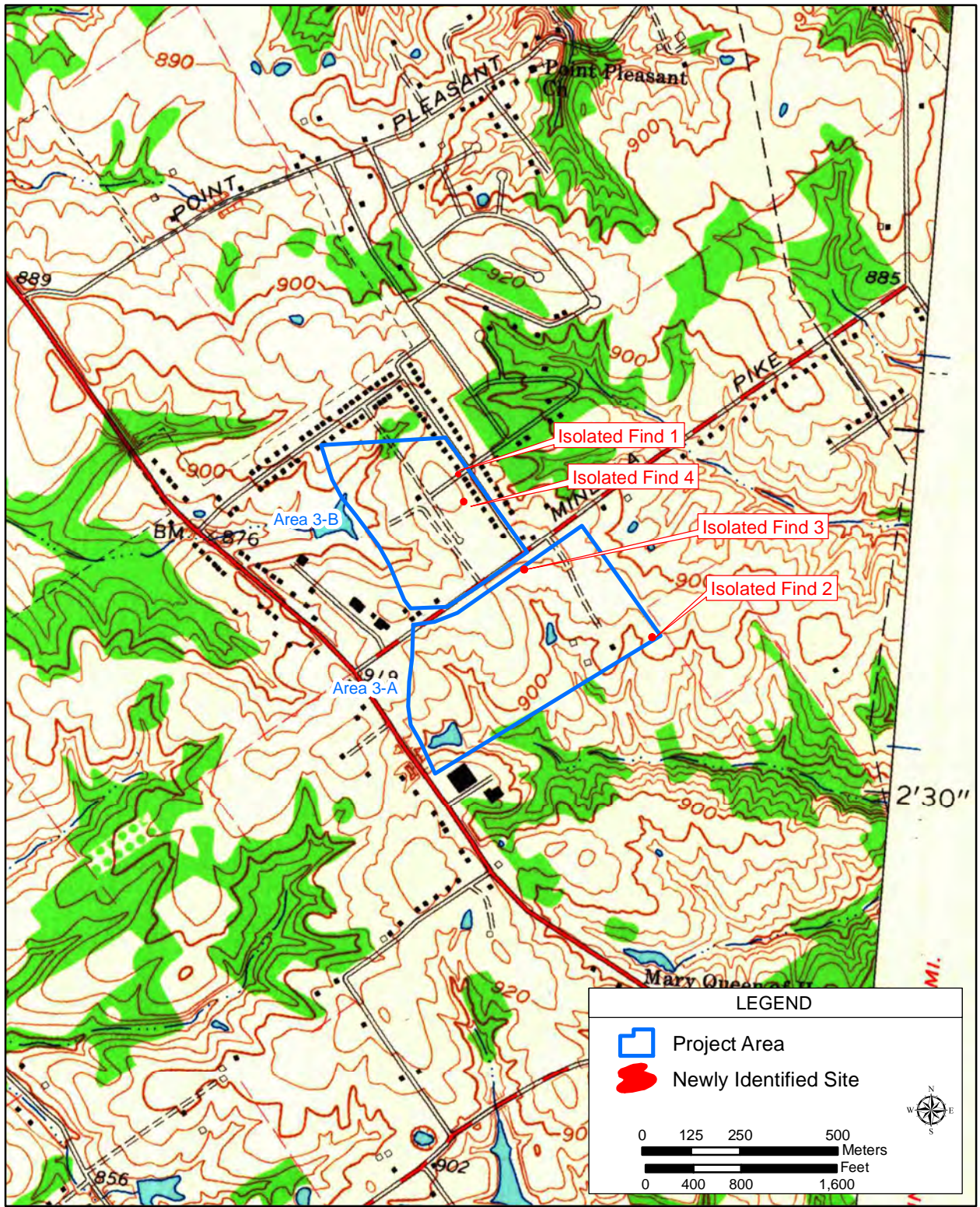
Portion of the 1914
West Cincinnati, OH 15' USGS Topographic Map
Showing the Location of Areas 3-A and 3-B.

FIGURE 6
REDACTED



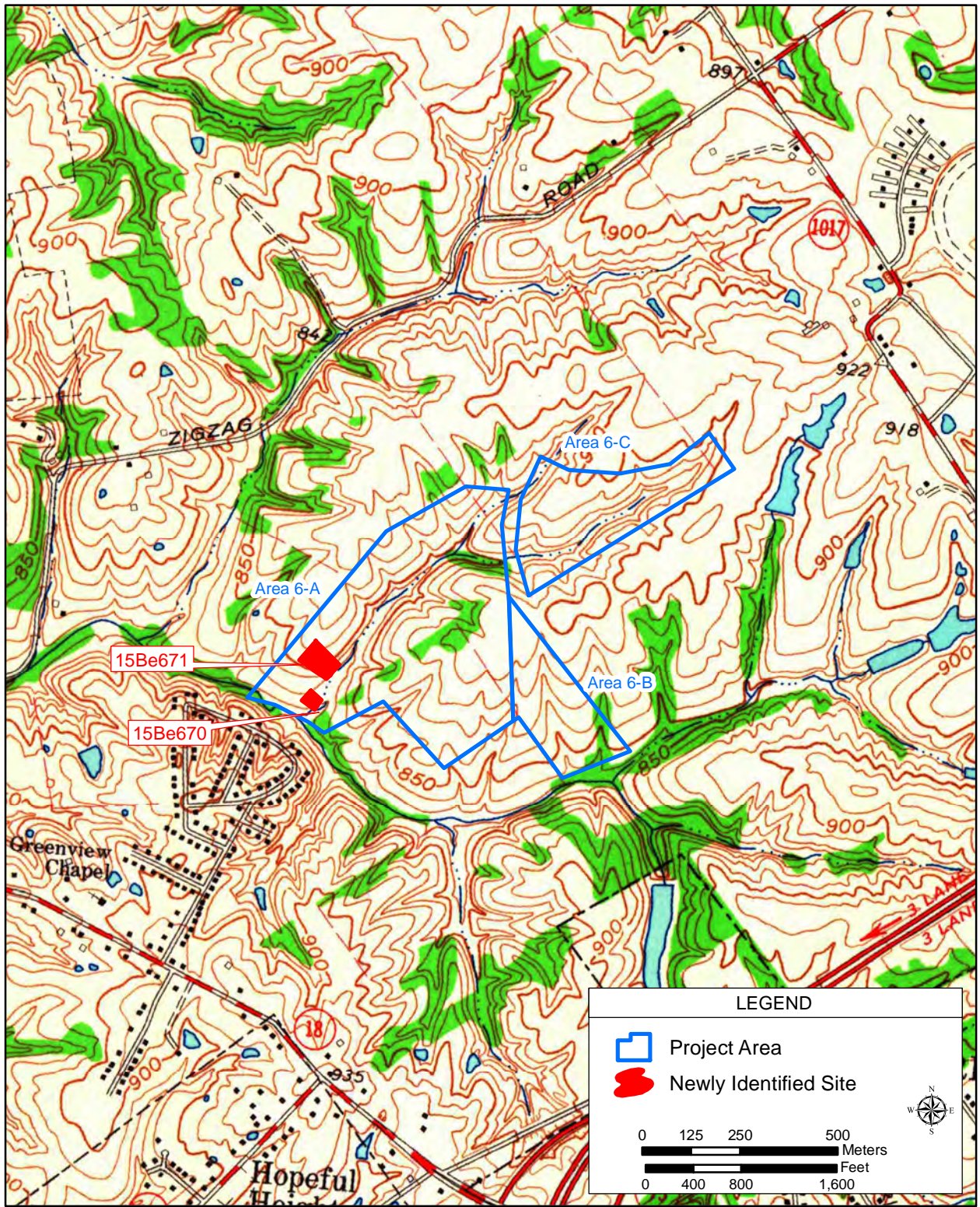
Portion of the 1914
West Cincinnati, OH 15' USGS Topographic Map
Showing the Location of Areas 6-A, 6-B, and 6-C

FIGURE 7
REDACTED



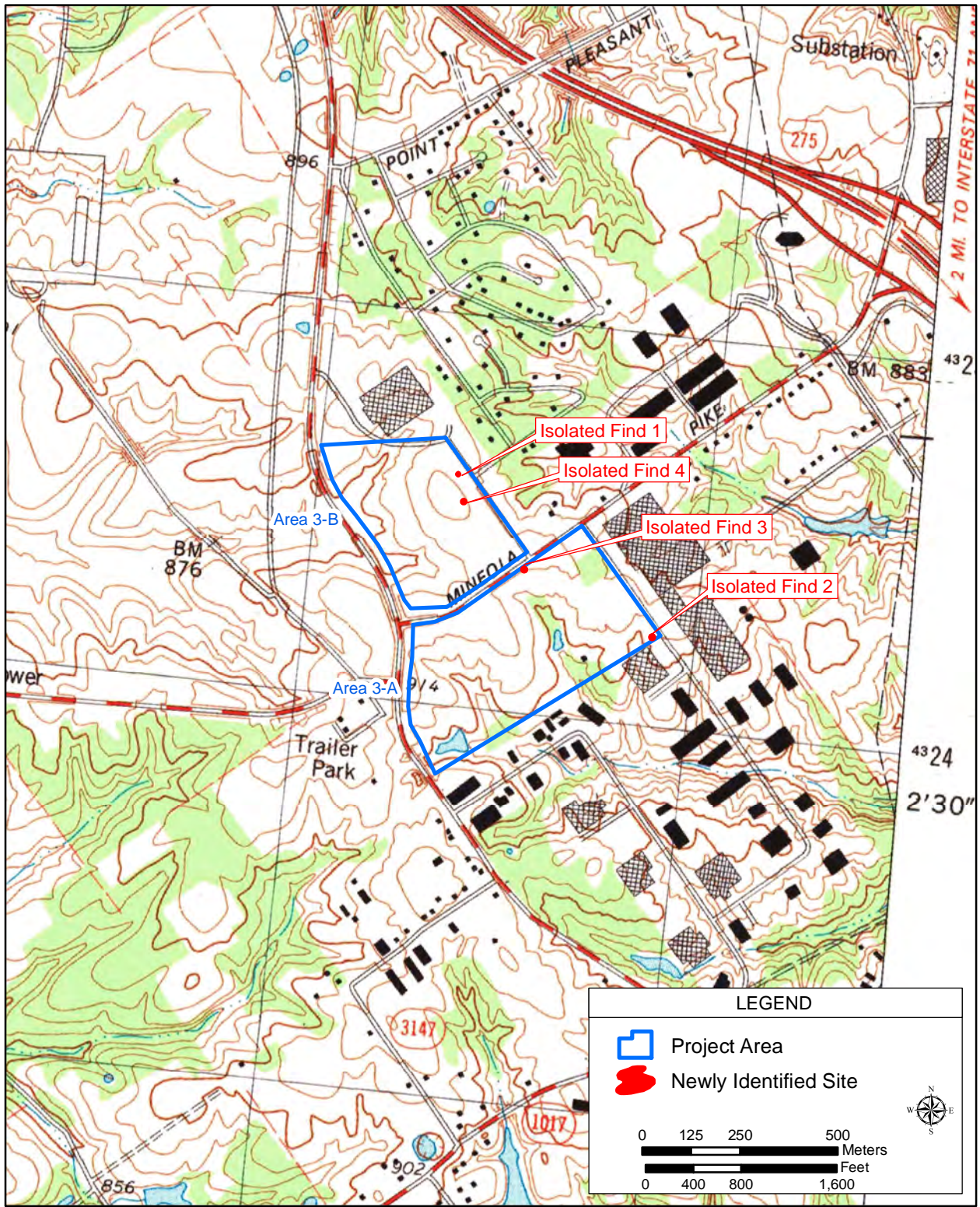
Portion of the 1961
Burlington, KY 7.5' USGS Topographic Quadrangle
Showing the Location of Areas 3-A and 3-B

FIGURE 8
REDACTED



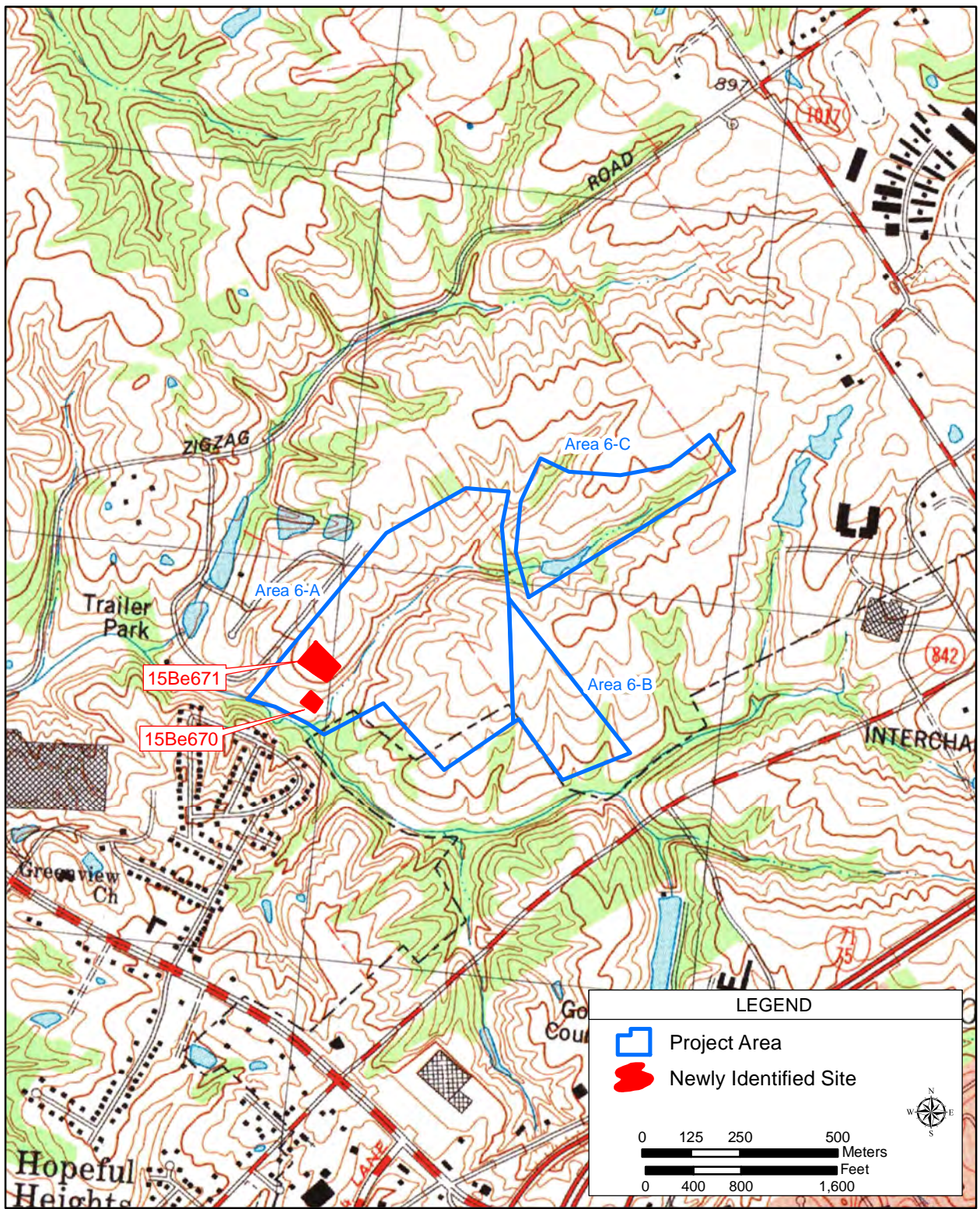
Portion of the 1961
Burlington, KY 7.5' USGS Topographic Quadrangle
Showing the Location of Areas 6-A, 6-B, and 6-C

FIGURE 9
REDACTED



Portion of the 1983 (Revised 1991)
Burlington, KY 7.5' USGS Topographic Quadrangle
Showing the Location of Areas 3-A and 3-B

FIGURE 10
REDACTED



Portion of the 1983 (Revised 1991)
Burlington, KY 7.5' USGS Topographic Quadrangle
Showing the Location of Areas 6-A, 6-B, and 6-C

4.2 Phase I Survey Results

The Phase I archaeological survey was conducted between April 28 and May 2, 2014. The project area consisted of five parcels: Area 3-A (33 ac.), 3-B (47 ac.), 6-A (64 ac.), 6-B (15 ac.), and 6-C (25.4 ac.). A total of 1,137 shovel tests were completed. Two archaeological sites (15Be670 and 15Be671) and four isolated finds (Isolated Find 1, Isolated Find 2, Isolated Find 3, and Isolated Find 4) were identified. Each area and the artifacts found within them will be discussed individually, below.

4.2.1 Area 3-A

Area 3-A is located on the eastern side of the Cincinnati/Northern Kentucky International Airport. This parcel of land covers an area of approximately 13.4 ha (33 ac.). Area 3-A is bounded by Jamike Avenue on the northeast border, by Mineola Pike on the northwest border, by Donaldson Highway (KY 236) on the southwest border, and by commercial buildings that front Cox Road on the southeast border. At the time of survey, the field was relatively flat and predominantly grass-covered; areas of secondary growth woods that surrounded creek drainages covered about 20% of Area 3-A (Figure 11, Plate 1).




Given that Area 3-A was grass-covered and provided limited ground visibility (less than 10%), the entire field was shovel tested (n=331 STPs). Any individual shovel tests that fell on steep slope, highly disturbed areas (such as roadside), or in inundated areas were not excavated (n=87). A recent trash dump containing tin roofing, tin sheets, wooden pallets, abandoned fence posts, and utility poles was encountered along the western edge of the woodlot in the northeast corner. The southwestern edge of the field that is bordered by Donaldson Highway is disturbed due to drainage grading that was completed during highway construction. Soils mapped in Area 3-A consist of Rossmoyne (RsB, RsC), Avonburg (Av), and Jessup (JeD) silt loams (Table 1). Shovel Test B16 (Isolated Find 2) provides a representative soil profile of this Area (Figure 12). The A horizon is composed of dark grayish brown (10YR 4/2) silt loam to a depth of 27 cm (11 in.) below surface, underlain with yellowish-brown (10YR 5/6) silty clay loam subsoil.

There were three positive shovel tests within Area 3-A. Shovel Test B16 yielded a single historical artifact. Subsequent radial shovel testing yielded a single prehistoric artifact (STP B16+10S). The location of these two artifacts, combined, was identified as Field Site 14-67601-004; however, the recovered historical artifact was later identified as a fragment of a clay pigeon, and was not considered representative of a historical occupation. The clay pigeon artifact was de-accessioned and is not included in any further discussions. The single prehistoric artifact recovered from this resource is considered an isolated artifact and has since been assigned the designation of Isolated Find 2 (Figure 12). This resource is located in the eastern corner of Area 3-A. Shovel Test I1 yielded a single prehistoric artifact. All subsequent radial shovel tests were negative. This find is identified as Isolated Find 3 (Field Site 14-67601-005) (Figure 13). These resources are discussed in detail later in this report.


FIGURE 11
REDACTED



LEGEND

-  Project Area Boundary
-  Newly Identified Site
-  Previously Recorded Site

Survey Coverage Method

-  Shovel Testing

60 0 60 Meters

200 0 200 Feet

Aerial Photograph Showing
Survey Coverage of
Areas 3-A and 3-B
and the Location of
Isolated Finds 1, 2, 3, and 4

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Figure 11



Plate 1. Area 3-A, facing north.

FIGURE 12
REDACTED



LEGEND

- Project Area Boundary
- Survey Field Division
- Newly Identified Site
- Feature
- Shovel Test - Negative
- Shovel Test - Prehistoric Material
- Shovel Test - Historical Material
- Structure

10 0 10 Meters
 40 0 40 Feet

Plan View of Isolated Find 2 in Area 3-A

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Figure 12

FIGURE 13
REDACTED



LEGEND

- Project Area Boundary
- Survey Field Division
- Newly Identified Site
- Feature
- Shovel Test - Negative
- Shovel Test - Prehistoric Material
- Shovel Test - Historical Material
- Structure

10 0 10 Meters
40 0 40 Feet

Plan View of Isolated Find 3 in Area 3-A

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Figure 13

4.2.2 Area 3-B

Area 3-B is also located on the eastern side of the Cincinnati/Northern Kentucky International Airport. This parcel of land covers an area of approximately 19 ha (47 ac.). Area 3-B is bounded by Delta Road on the northeast and northwest borders, by Donaldson Highway (KY 236) on the southwest border, and by Mineola Pike on the southeast border. At the time of survey, the field was relatively flat and predominantly grass-covered (Figure 11, Plate 2).

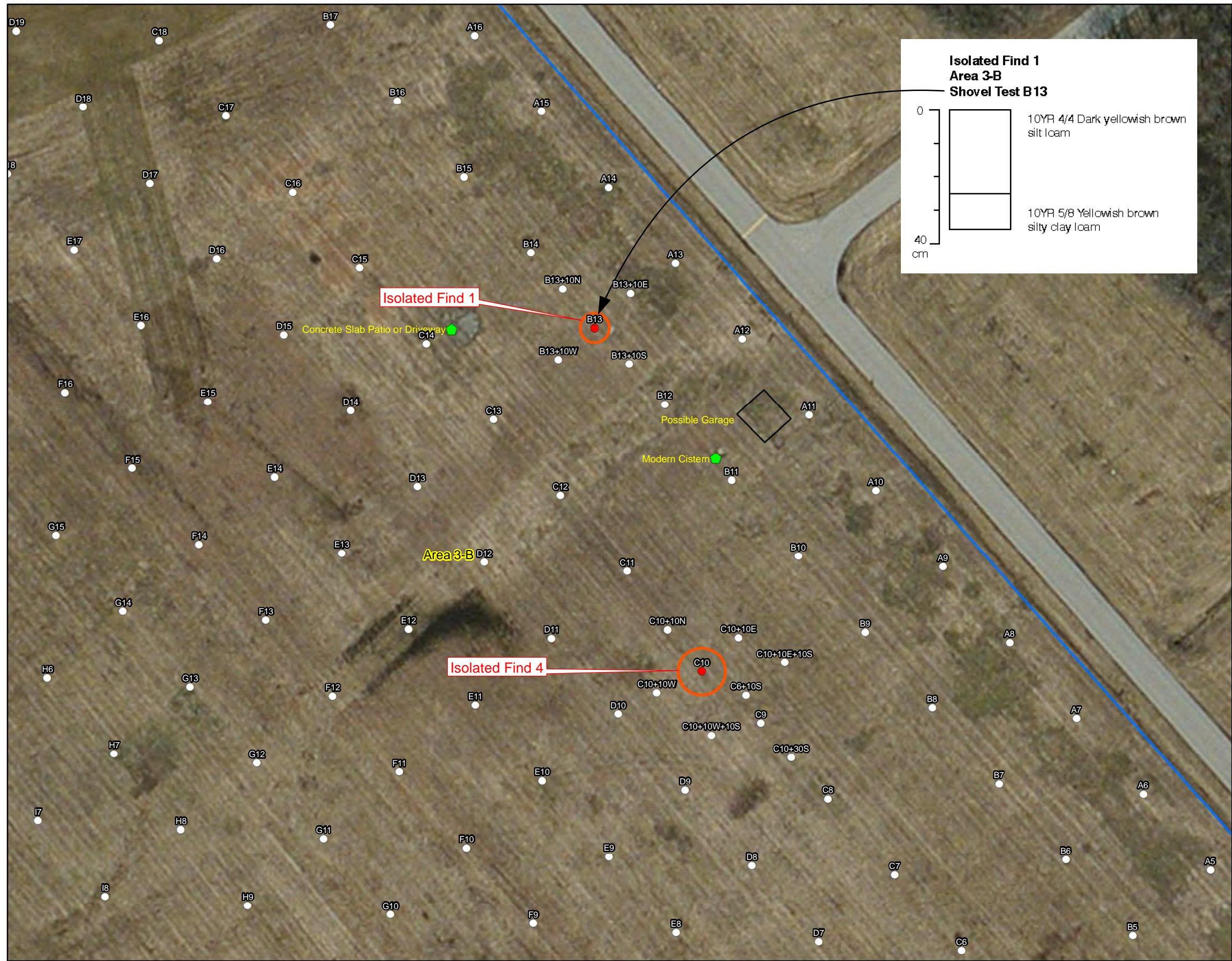
Given that Area 3-B was grass-covered and provided limited ground visibility (less than 10%), the entire field was shovel tested (n=267 STPs). Any individual shovel tests that fell on steep slope, highly disturbed areas (such as roadside), or in inundated areas were not excavated (n=64). As shovel testing progressed across Area 3-B, it became evident that this area was disturbed. A housing development and farm residence had previously stood within (and beyond) the confines of this parcel of land. These structures all were removed sometime between 1961 and 1983 (as indicated in the Literature Review) and the land was subsequently graded. Remaining surface evidence of the housing development includes a portion of a concrete driveway or patio, remnants of a modern cistern, and remnants of a cinderblock foundation (perhaps for a garage or other outbuilding) (Figure 14). Soils mapped in Area 3-B consist of Rossmoyne (RsB, RsC) silt loam, and Jessup (JsD3) silty clay loam (Table 1). Shovel Test B13 (Isolated Find 1) provides a representative soil profile of this Area (Figure 14). The A horizon is composed of dark yellowish brown (10YR 4/4) silt loam to a depth of 24 cm (9 in.) below surface, underlain with yellowish brown (10YR 5/8) silty clay loam subsoil.

There were two positive shovel tests within Area 3-B. Shovel Test C10 yielded a single prehistoric artifact. All subsequent radial shovel tests were negative. The find was identified as Isolated Find 4 (Field Site 14-67601-001) (Figure 14). This site is located near the northeastern edge of Area 3-B and is considered to be within a highly disturbed context associated with the razing of the housing development described above. Shovel Test I1 yielded a single prehistoric artifact. All subsequent radial shovel tests were negative. This find is identified as Isolated Find 1 (Field Site 14-67601-002). This find is located near the northeastern edge of Area 3-B and it, too may be from a disturbed context. Isolated Finds 1 and 4 are discussed in detail later in this report.



Plate 2. Area 3-B, facing west.

FIGURE 14
REDACTED



LEGEND

- Project Area Boundary
- Survey Field Division
- Newly Identified Site
- Feature
- Shovel Test - Negative
- Shovel Test - Prehistoric Material
- Shovel Test - Historical Material
- Structure

10 0 10 Meters
40 0 40 Feet

Plan View of Isolated Find 1 and Isolated Find 4 in Area 3-B

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ARCHAEOLOGY - HISTORY - HISTORIC PRESERVATION

Figure 14

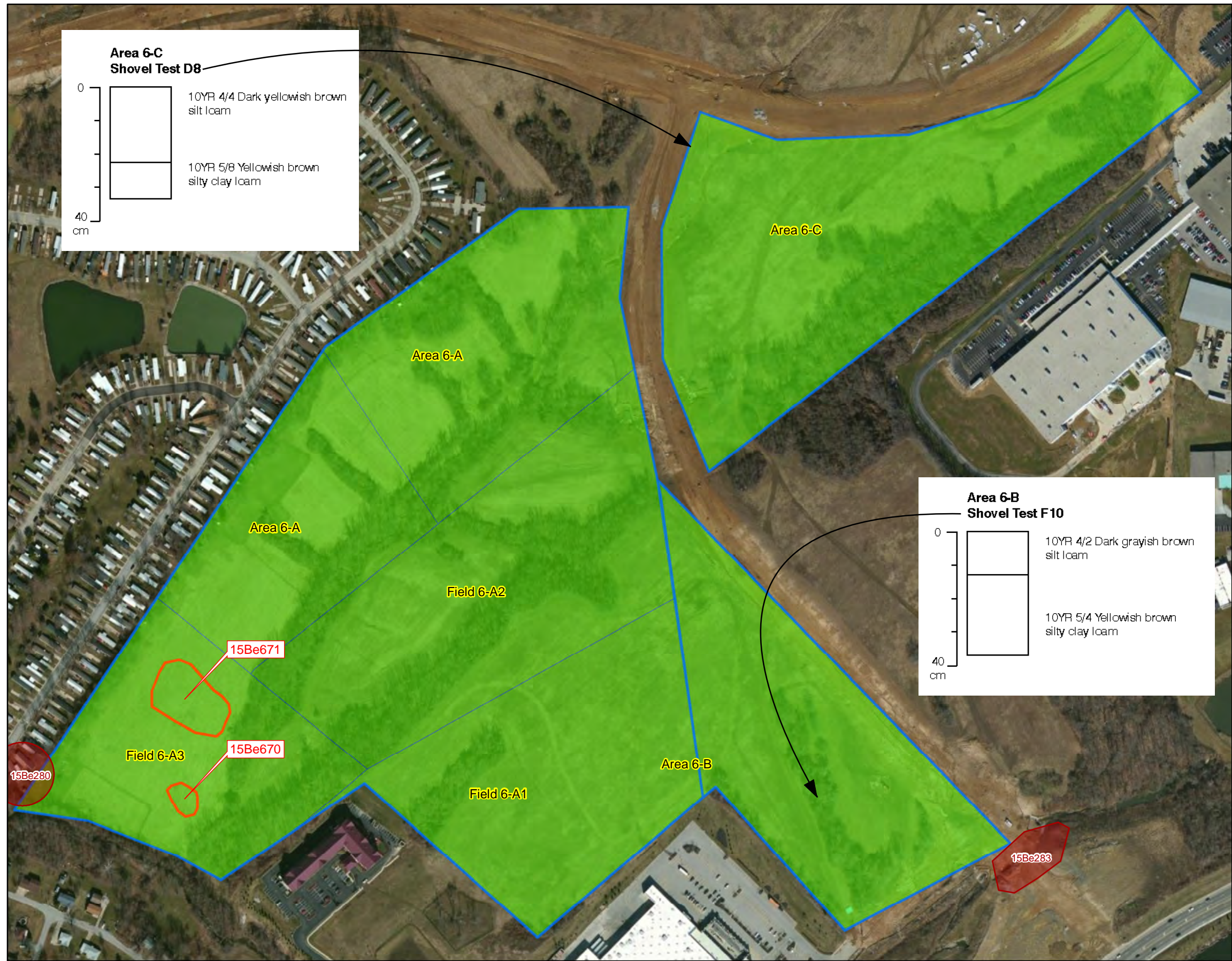
4.2.3 Area 6-A

Area 6-A is located south of the Cincinnati/Northern Kentucky International Airport. This parcel of land covers an area of approximately 26 ha (64 ac.). Area 6-A is bounded by the Ted Bushelman Way and Area 6-B along the eastern border, by a trailer park along the northwest border, and to the south by a small subdivision and commercial buildings. At the time of survey, the dissected landscape was predominantly grass-covered, but all drainage areas were lined with secondary growth woods and scrub (Figure 15, Plate 3).

Given the large extent of Area 6-A, it was further subdivided into Fields (Fields 6-A, 6-A1, 6-A2, and 6-A3) to facilitate recordkeeping and delineation of survey transects (Figure 15). Due to the limited ground visibility (less than 10%) of the mostly grass-covered area, all Fields were shovel tested (n=306 STPs). Any individual shovel tests that fell on steep slope, highly disturbed areas (such as roadside), or in inundated areas were not excavated (n=52). Soils mapped in Area 6-A consist of Rossmoyne (RsB, RsC), Jessup (JeD), Ashton (AsB), and Linside (Ln) silt loams, and Jessup (JsD3) silty clay loam. Shovel Tests W2 (Site 15Be670) and AA3 (Site 15Be671) provide representative soil profiles of this Area (Figure 16). In STP W2 (Site 15Be670), the A horizon is composed of dark yellowish brown (10YR 4/4) silt loam to a depth of 30 cm (12 in.) below surface, underlain with yellowish-brown (10YR 5/6) silty clay loam subsoil. In STP AA3 (site 15Be671), the A horizon is composed of brown (10YR 4/3) silt loam to a depth of 23 cm (9 in.) below surface, underlain with yellowish-brown (10YR 5/6) silty clay loam subsoil.

Two archaeological sites (22 positive shovel tests) were identified within Area 6-A (Field 6-A3). Site 15Be670 (Field Site 14-67601-006) is defined by four positive shovel tests yielding historical artifacts and one shovel test yielding one prehistoric artifact (Figure 16). Site 15Be671 (Field Site 14-67601-007) is defined by 17 positive shovel tests and two general surface finds yielding historical artifacts (Figure 16). These sites are located in the western portion of Area 6-A. These resources are discussed in detail in *Section 6.0: Description and Analysis of Materials Recovered* and *Section 7.0: Resource Descriptions*. Site 15Be280 was previously identified to the southwest of Area 6-A (and within the adjacent trailer park), but no artifacts were found near this location within Area 6-A.

FIGURE 15
REDACTED



LEGEND

- Project Area Boundary
- Newly Identified Site
- Previously Recorded Site

Survey Coverage Method

- Shovel Testing

60 0 60 Meters
200 0 200 Feet

Aerial Photograph Showing Survey Coverage of Areas 6-A, 6-B, and 6-C and the Location of Sites 15Be670 and 15Be671

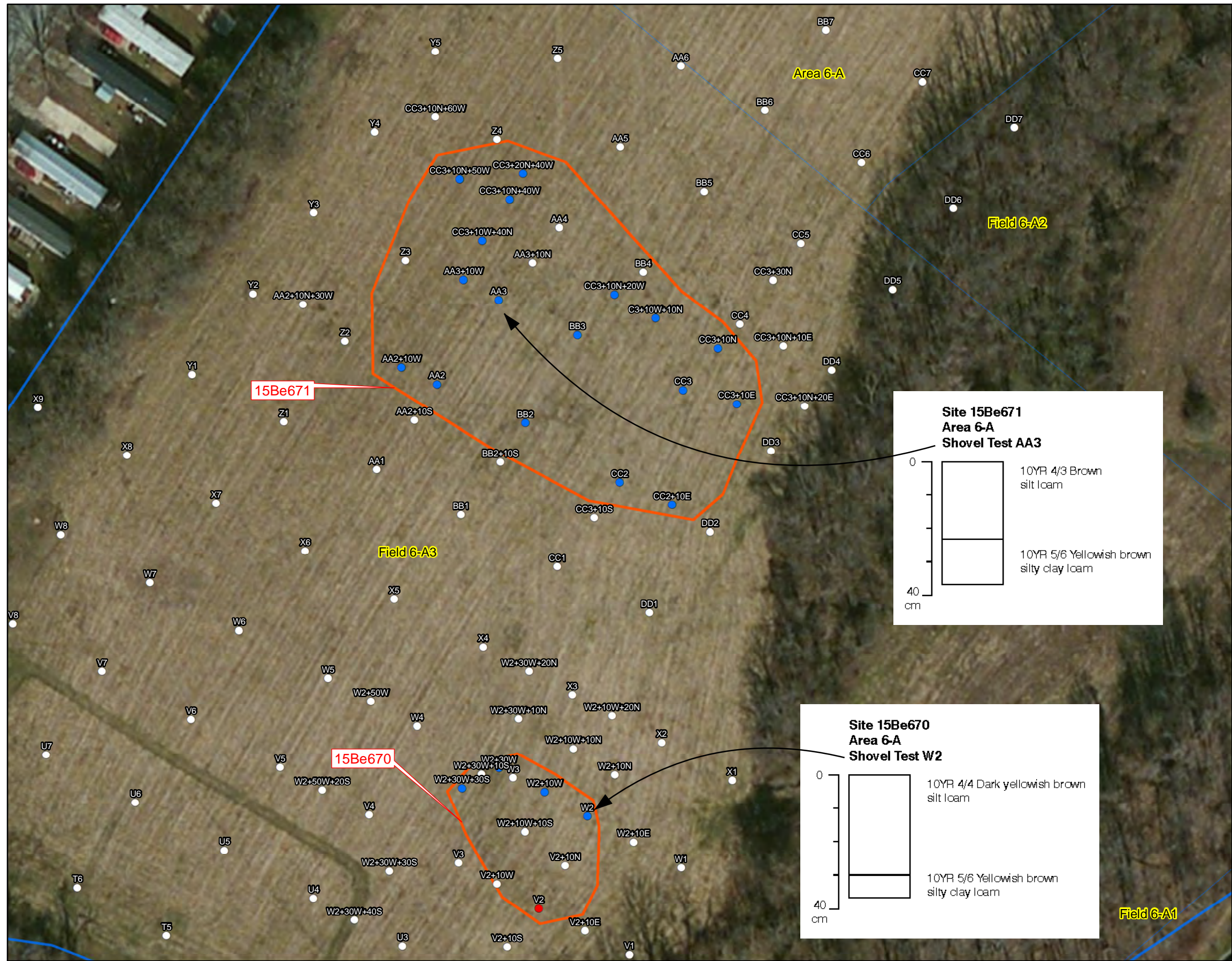
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Figure 15



Plate 3. Site 15Be671, Area 6-A, facing northeast.

FIGURE 16
REDACTED



LEGEND

- Project Area Boundary
- Survey Field Division
- Newly Identified Site
- Feature
- Shovel Test - Negative
- Shovel Test - Prehistoric Material
- Shovel Test - Historical Material
- Structure

10 0 10 Meters
40 0 40 Feet

**Site 15Be671
Area 6-A
Shovel Test AA3**

**Site 15Be670
Area 6-A
Shovel Test W2**

**Plan View of
Sites 15Be670 and
15Be671
in Area 6-A**

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Figure 16

4.2.4 Area 6-B

Area 6-B is located south of the Cincinnati/Northern Kentucky International Airport. This parcel of land covers an area of 0.2 ha (15 ac.). Area 6-B meets Area 6-A along its (Area 6-B) western border and Ted Bushelman Way runs along its eastern boundary. Houston Road (KY 842) is located to the south of Area 6-B and a commercial building that sits on Doering Drive abuts the southwestern boundary. At the time of survey, the field was grass-covered in some areas, wooded along the creek drainage that runs north-south through Area 6-B, and disturbed by mechanical stripping and grading associated with the road construction along the eastern boundary (Figure 15, Plate 4).

Given the limited ground visibility (less than 10%) in Area 6-B, the entire field was shovel tested (n=93 STPs). Any individual shovel tests that fell on steep slope, highly disturbed areas (such as roadside), or in inundated areas were not excavated (n=19). Soils mapped in Area 6-B consist of Rossmoyne (RsB, RsC) silt loam, Lindside (Ln) silt loam, and Jessup (JsD3) silty clay loam (Table 2). Shovel Test F10 provides a representative soil profile of this Area (Figure 15). The A horizon is composed of dark grayish brown (10YR 4/2) silt loam to a depth of 12 cm (5 in.) below surface, underlain with yellowish-brown (10YR 5/4) silty clay loam subsoil.

There were no positive shovel tests and, therefore, no cultural resources identified within Area 6-B. A previously identified site (15Be283) is located off the southeast corner of Area 6-B (and within the road construction zone), but no artifacts were found in Area 6-B, thus confirming that the boundaries reported for Site 15Be283 are likely accurate.

4.2.5 Area 6-C

Area 6-C is located south of the Cincinnati/Northern Kentucky International Airport. This parcel of land covers an area of 10.3 ha (25.4 ac.). Aero Drive runs along the northern boundary of Area 6-C and Ted Bushelman Way runs the length of the western boundary. Commercial buildings flank the eastern and southern boundaries of Area 6-C. At the time of survey, it was obvious that approximately 70% of Area 6-C (the northern and western portions) had been affected by road construction activity; drainage culverts were installed in some areas while mechanical excavation, stripping, and grading were done to other areas. The southern portion of Area 6-C is sloped and follows a creek that supports secondary growth forest and scrub (Figure 15, Plate 5).

Given that there was limited ground visibility (less than 10%), the entire field was shovel tested (n=140 STPs). Any individual shovel tests that fell on steep slope, highly disturbed areas (such as roadside), or in inundated areas were not excavated (n=89). Soils mapped in Area 6-C consist solely of Rossmoyne (RsB, RsC) silt loam (Table 2). Shovel Test D8 provides a representative soil profile of this Area (Figure 15). The A horizon is composed of dark yellowish brown (10YR 4/4) silt loam to a depth of 22 cm (9 in.) below surface, underlain with yellowish brown (10YR 5/8) silty clay loam subsoil.

There were no positive shovel tests and, therefore, no cultural resources identified within Area 6-C.



Plate 4. Area 6-B, facing south-southeast.



Plate 5. Wet area in Area 6-C, facing east.

5.0 DESCRIPTION AND ANALYSIS OF MATERIALS RECOVERED

This section provides detailed descriptions and analyses of the cultural materials recovered during the Phase I archaeological survey of Areas 3-A, 3-B, 6-A, 6-B, and 6-C. The purpose of the Materials Recovered section is to present an overview of the temporal and functional classification of the artifacts recovered during the project, using the classification scheme discussed in the Laboratory Methods section, and to present substantive interpretations of these materials as they relate to the prehistoric and historical occupations of the identified sites.

5.1 Prehistoric Materials Recovered

A total of five prehistoric artifacts were recovered during the Phase I archaeological survey of Areas 3-A, 3-B, 6-A, 6-B, and 6-C (Table 5). These materials were recovered from a total of five contexts: one archaeological site (15Be670), three isolated finds (Isolated Find 1, Isolated Find 2, and Isolated Find 3), and Field Site 14-67601-001 (disturbed context). The artifacts were classified into a single functional category: chipped stone. Chipped stone artifacts in the assemblage consist solely of debitage (n=5).

Area	Resource	Material	Frequency	%
3-A	Isolated Find 2	Class 2: Unspecified Reduction Flake	1	100
		Total	1	100
3-A	Isolated Find 3	Class 7: Flake Fragment	1	100
		Total	1	100
3-B	Isolated Find 1	Class 7: Flake Fragment	1	100
		Total	1	100
3-B	Isolated Find 4	Class 7: Flake Fragment	1	100
		Total	1	100
6-A	Site 15Be670	Class 7: Flake Fragment	1	100
		Total	1	100

The chipped stone debitage recovered during the survey represents two flake types. The majority of flakes recovered within the Project Areas consist of Class 7 flake fragments (n=4) and the remaining flake is a Class 2 flake, unspecified reduction sequence (Table 5). Given that each artifact was recovered from a different context, the site assemblages are too small to be subjected to meaningful interpretations of lithic reduction activities.

Chert types include Boyle (n=2), Paoli (n=2) and Unidentified (n=1) (Table 6). All of the lithic raw material types represented in the composite assemblage occur locally within the present project area.

Type	Outcrops by Physiographic Region	Sites	Frequency
Boyle	Bluegrass	Isolated Find 3 and Isolated Find 4	2
Paoli	Outer Bluegrass, Western Pennyroyal (Mississippian Plateau)	Site 15Be670 and Isolated Find 1	2
Unidentified	N/A	Isolated Find 2	1

5.1.1 Inter-site Comparison and Discussion

Most of the previously recorded prehistoric sites near Areas 3-A, 3-B, 6-A, 6-B, and 6-C can be characterized as low-density lithic scatters. This characterization is consistent with the materials and contexts described above. The prehistoric assemblages from the current survey consist solely of isolates and, therefore, do not provide enough information for a meaningful comparative discussion regarding lithic reduction activity. However, the predominance of low-density lithic scatters in the area may be indicative of short-term occupations; if not for the area in general, most certainly for the current survey areas.

5.2 Historical Materials Recovered

A total of 72 historical artifacts was recovered from the Phase I archaeological survey of Areas 3-A, 3-B, 6-A, 6-B, and 6-C (Table 7). These materials were recovered from newly identified sites 15Be670 and 15Be671. The materials are assigned to three functional groups: Architectural, Domestic, and Activities.

Area	Resource	Functional Group/Material	Frequency	%		
6-A	15Be670	<i>Domestic Group</i>				
		Pearlware, impressed blue	1	5.0		
		Pearlware, unscaloped and impressed	2	10.0		
		Earthenware, unidentifiable fragment	2	10.0		
		Stoneware, salt glazed	2	10.0		
		Stoneware, Albany slip and salt glazed	1	5.0		
		Whiteware, transfer print, green	1	5.0		
		Whiteware, undecorated	1	5.0		
		Whiteware, unidentifiable fragment	3	15.0		
		Faunal, Bone	1	5.0		
		<i>Architectural Group</i>				
		Nail, machine-cut	2	10.0		
		Brick, ceramic, fragment	2	10.0		
		Window Pane Glass	1	5.0		
		<i>Activities</i>				
		Charcoal, wood	1	5.0		
		Total		20	100.0	
		6-A	15Be671	<i>Domestic Group</i>		

Area	Resource	Functional Group/Material	Frequency	%
		Porcelain, clear glaze	2	3.8
		Whiteware, undecorated	1	1.9
		Whiteware, unidentifiable fragment	7	13.5
		Ironstone, undecorated	5	9.7
		Ironstone, unidentifiable fragment	1	1.9
		Stoneware, salt-glazed	2	3.8
		Stoneware, Albany slip and salt-glazed	2	3.8
		Terra Cotta, unglazed	2	3.8
		Glass Lamp Chimney, colorless	2	3.8
		<i>Architectural Group</i>		
		Brick, ceramic, fragment	13	25.0
		Nail, machine-cut	1	1.9
		Nail, indeterminate	1	1.9
		Window Pane Glass	4	7.9
		<i>Activities Group</i>		
		Cinders, coal	3	5.9
		Slag, synthetic	1	1.9
		Glass Vessel, blue, light	2	3.8
		Glass Vessel, amethyst	2	3.8
		Other	1	1.9
		Total	52	100.0

5.2.1 Architectural Group

The Architectural group consists of items associated with the construction and enhancement of buildings and structures; however, materials such as nails also were used in furniture and storage boxes. In total, 24 artifacts were assigned to the Architectural group, including ceramic brick fragments (n=15), flat window pane glass (n=5), machine-cut nails and fragments (n=3), and unidentifiable nails (n=1) (Table 7).

Ceramic bricks typically are used for house and chimney construction and may be dated if a maker's mark is imprinted. However, none of the few fragments recovered at 15Be671 (n=13) and 15Be670 (n=2), Area 6-A, showed any markings.

Window pane glass thickness is correlated with a general trend of increasing thickness through time, and this correlation is regular enough to provide dates from thickness measurements (Moir 1987). However, this method of assigning date ranges works best when there is a statistically robust sample, which is not the case for the assemblages from this survey. Four fragments of window pane glass were recovered from Site 15Be671 and one fragment was recovered from Site 15Be670 in Area 6-A.

Early machine-cut nails date from about 1810 to 1840, while later machine-cut nails date from about 1840 to 1900 (Nelson 1963). Machine-cut nails are still manufactured today, but they were largely replaced by wire nails in the 1880s (Smith 1975). The machine-cut nails/fragments recovered were indeterminate for the early or late dates of manufacture. Two

machine-cut nails were recovered from Site 15Be670 and one machine-cut nail was recovered from Site 15Be671; both sites are located in Area 6-A. Additionally, one indeterminate (excessively corroded) nail fragment were recovered from Site 15Be671. The presence of machine-cut nails at these two sites suggests a nineteenth century occupation.

5.2.2 Domestic Group

The Domestic/Kitchen group includes artifacts related to the preparation, service, consumption, or storage of foods and beverages. Major categories consist of refined and coarse ceramics and container glass. This category comprises the most commonly represented functional group in the composite survey assemblage and includes 38 items (Table 7).

Ceramic Domestic group artifacts include pearlware (n=3), whiteware (n=13), stoneware (n=7), terra cotta (n=2), ironstone (n=6), hard paste porcelain (n=2), and earthenware (n=1). Pearlware, whiteware, stoneware, and terra cotta were further identified by decoration and/or glaze/slip; no decorative treatments were present on ironstone, porcelain, or earthenware.

All pearlware fragments were recovered from Site 15Be670. The pearlware specimens were badly exfoliated but exhibit annular blue banding around the rim (n=2) and impressed patterning (n=1). Pearlware was developed in England ca. 1780 and became common in the United States from roughly 1810 to 1840 (Majewski and O'Brien 1987:118-119; Price 1982:10-11).

Although the majority of whiteware in the composite assemblage are undecorated (n=12), one specimen recovered from Site 15Be670 exhibits green transferprint, which has a manufacture date range from 1828 to present. Whiteware generally dates from ca. 1820 to the present, although it is most common between about 1840 and 1920 (des Fontaines 1990:4; Majewski and O'Brien 1987:119-125; Price 1982). Whiteware occurs in virtually every decorative type that was available during the nineteenth century. Decalcomania on English wares dates from 1890 to the present-day (Shaw 1900). Whiteware was almost always decorated in some way, and although most of the examples in the composite assemblage are undecorated, these are most likely undecorated fragments of decorated vessels.

Decorative treatments on stoneware consist of seven specimens. Site 15Be670 yielded salt glazed (n=2) and Albany slipped interior with a salt glazed exterior (n=1). Site 15Be671 yielded salt glazed (n=2) and Albany slipped interior with a salt glazed exterior (n=2). American salt-glazed stoneware generally dates from 1705 to 1930 (Greer 1999; Ketchum 1991:86; Mountford 1971). Albany slip generally dates from 1805 to 1920 and was ubiquitous in the Midwest from 1830 to 1900 (Phillippe 1990:80; Ramsay 1939:21-22, 59).

Two fragments of unglazed terra cotta were recovered from Site 15Be671. Due to the abundance of unglazed terra cotta manufacturers and the lack of distinguishing characteristics that would identify the maker, this ceramic type generally is considered to be a poor temporal indicator.

Six fragments of undecorated ironstone were recovered from Site 15Be671. Ironstone began appearing on American sites during the 1840s, and remained in production from 1842 to 1930

(Miller 1991:10). After 1850, ironstone was predominantly undecorated, or was decorated with molded geometric, floral, or foliate motifs.

Two fragments of porcelain were recovered from Site 15Be671. Given that these specimens exhibit no decoration or maker's mark, these fragments are not temporally diagnostic (Ketchum 1971, 1983, 2000).

One piece of unidentifiable refined earthenware specimen was recovered from Site 15Be670. The fragment exhibited evidence of a blue hand-painted underglaze, but could not be described further (Lofstrom et al. 1982).

In addition to ceramic artifacts, one fragment of colorless lamp chimney glass is represented in the composite Domestic group assemblage. This artifact was recovered from Site 15Be671 and exhibits no diagnostic characteristics. These items are commonly found between 1875 to present.

The last of the Domestic group materials includes one piece of unidentified animal bone food refuse recovered from Site 15Be670.

5.2.3 Activities Group

The Activities group includes artifacts used in the performance of various recreational and/or manufacturing activities, such as toys and tools. A total of 10 artifacts were assigned to the Activities group, and items in this composite assemblage consist of vessel glass (n=4), coal (n=3), slag (n=1), charcoal (n=1), and other (n=1) (Table 7).

All vessel glass was recovered from Site 15Be671 and function was described as unknown. Two specimens were light blue in color and two specimens were solarized amethyst. Solarized amethyst glass dates from 1880 to 1925 (Newman 1970:74). The amethyst color is derived from manganese oxide used in the manufacturing process, which turns purplish after extended exposure to the sun (Jones and Sullivan 1985:13). The end of amethyst glass is associated with the change to selenium, which began in 1915, and was almost exclusively used after German imports of manganese were suspended in 1918 (Deiss 1981:82-83).

Coal cinders and slag were recovered from Site 15Be671 and wood charcoal was recovered from Site 15Be670. Coal was adopted as a primary source of fuel in the mid- to late-nineteenth century, prior to which firewood was used both domestically and commercially as an energy source. Cinders are the fused impurities produced by the burning of coal. The small quantity of these items recovered suggests that they may have been part of a recreational activity rather than fuel for cooking or heating a home.

The single artifact labeled as 'other' is described as being very small and burned/melted and has a function that could not be identified. It was recovered from Site 15Be671.

5.2.4 Inter-site Comparison and Discussion

The historical assemblages recovered during Phase I survey of Areas 3-A, 3-B, 6-A, 6-B, and 6-C yielded artifacts consistent with remains typically recovered from domestic habitation sites or trash dumps. Of the 72 artifacts recovered, 36% (n=26) are assigned to the Architectural group and 53% (n=38) are assigned to the Domestic group. The remaining group is Activities and it represents the remaining 11% (n=8) of the artifacts.

The assemblages from sites 15Be670 and 15Be671 are clearly indicative of domestic functions. However, the low quantity of artifacts, lack of structural remains, and historical map evidence of a late nineteenth century structure in a different, but nearby, location raise the question of primary (residential) or secondary (trash disposal) context. Additionally, the temporally diagnostic materials recovered indicate a range of manufacture from the mid- to late-nineteenth century through the early-twentieth century.

6.0 RESOURCE DESCRIPTIONS

During field investigations of Areas 3-A, 3-B, 6-A, 6-B, and 6-C, two new archaeological sites (15Be670 and 15Be671) and four Isolated Finds were identified. These newly identified archaeological resources are described in greater detail below.

State Site No.: 15Be670

Resource Type: Prehistoric Isolate/Historical Artifact Scatter

Affiliation: Unaffiliated Prehistoric/Unknown Historical

Topographic Setting: Upland Slope

Elevation: 253 m (830 ft.) AMSL

UTM Coordinates: Zone 16, N4320852 E702958

Diagnostic Artifacts: Historical Ceramics

NRHP Evaluation: Not Eligible

Discussion: Site 15Be670 (Field Site 14-67601-006) is a newly identified archaeological site located in the western portion of Area 6-A (Figure 15). Area 6-A, owned by the Kenton County Airport Board, is located south of the Cincinnati/Kentucky International Airport; it is bordered by residential subdivisions to the west and southwest and by commercial enterprise and roadways on all other sides. The site includes a prehistoric isolate and a low-density historical artifact scatter that, combined, cover an area measuring approximately 30 by 20 m (98 by 65 ft.), or 600 m² (0.06 ha or 0.15 ac.). The site is located on a grassy upland slope approximately 135 m (442 ft.) east of Hazel Drive and 173 m (568 ft.) north of Edge Hill Road. The field also includes patches of secondary growth trees and scrub. Surface visibility was less than 10 percent; therefore, a shovel testing survey method was completed. The nearest water source is an unnamed tributary of Gunpowder Creek, located approximately 85 m (280 ft.) to the south.

The site is characterized by one prehistoric isolate of unknown cultural or temporal affiliation and by a low-density historical artifact scatter that may date to the nineteenth century. The site was delineated by two positive shovel tests (STP V2 yielded the prehistoric flake and STP W2 yielded historical artifacts) and three positive radial shovel tests (all yielded historical artifacts) (Figure 16). The soil profile was composed of dark yellowish brown (10YR 4/4) silt loam to a depth of 30 cm (12 in.) below surface, underlain with yellowish-brown (10YR 5/6) silty clay loam subsoil.

A total of 21 artifacts was recovered from the site. The prehistoric isolate consists of a Class 7 flake fragment made from Paoli chert (Table 8). The flake is of unknown cultural or temporal affiliation.

Provenience	Artifact Class	Artifact Type	Raw Material	Total
STP V2	Debitage	Class 7 - Flake Fragment	Paoli	1

In total, 20 historical artifacts were recovered (Table 9); including machine-cut nails (n=2), flat window glass (n=1), and ceramic brick fragments (n=2) belonging to the Architectural group. Domestic group materials include whiteware (n=5), pearlware (n=3), stoneware (n=3), earthenware (n=2), and faunal bone (n=1). Additional material includes a piece of wood charcoal (n=1) assigned to the Activities group.

This assemblage is consistent with an occupation range dating from the mid-nineteenth to early twentieth century. Diagnostic artifacts used to determine this temporal reference include machine-cut nails, pearlware, Albany slip/salt-glazed stoneware, and whiteware. Machine-cut nails and pearlware attest to occupation during the mid-nineteenth century, whereas the stoneware and whiteware are more consistent with late-nineteenth and early-twentieth century occupation.

Provenience	Functional Group	Material/Type	Variety/Form	Total
STP W2	Domestic	Pearlware	Impressed, blue	1
STP W2	Domestic	Earthenware	Unidentified	1
STP W2	Domestic	Whiteware	Transfer-print, green	1
STP W2	Domestic	Stoneware	Salt glazed	1
STP W2	Architectural	Nail	Cut	1
STP W2+10W	Domestic	Earthenware	Unidentifiable fragment	1
STP W2+10W	Domestic	Whiteware	Undecorated	1
STP W2+10W	Domestic	Stoneware	Albany slip and salt glaze	1
STP W2+10W	Domestic	Stoneware	Salt glazed	1
STP W2+10W	Architectural	Brick	Ceramic, fragment	2
STP W2+10W	Architectural	Window Glass	Aqua, non-silvered	1
STP W2+30W	Domestic	Pearlware	Unidentifiable fragment	2
STP W2+30W	Domestic	Whiteware	Unidentifiable fragment	1
STP W2+30W	Domestic	Faunal	Bone	1
STP W2+30W	Architectural	Nail	Cut	1
STP W2+30W	Activities	Botanical	Carbon	1
STP W2+30W 20S	Domestic	Whiteware	Unidentifiable fragment	2
Total				20

No structural remains were identified at this site; however, the 1883 historic map of Florence Precinct (Figure 4) shows a residence belonging to A.G. Fisk approximately 250 m (820 ft.) to the east of Site 15Be670. It is possible that the artifacts recovered are associated with this residence, though perhaps as a trash dump given the low quantity of artifacts in general and, more specifically, the low quantity of Architectural group artifacts. The Fisk residence was razed sometime prior to the 1914 USGS survey and the land has been farmed ever since. It also is possible that these artifacts are associated with historical Site 15Be671, since ceramics recovered are similar in type and date (nineteenth century). The area surrounding Project Area 6-A and Site 15Be670, not including the residential areas, has been extensively surveyed and many archaeological sites have been previously identified. Of the sites previously identified, the nearest (15Be280) is approximately 170 m (560 ft.) to the west. Site 15Be280 is a small (750 m², or 8,073 ft.²) Middle Woodland site that was recommended not eligible for inclusion in the NRHP and no further investigations were done on the site.

Based on the Phase I archaeological investigations, Site 15Be670 consists of a prehistoric isolate and a low-density historical artifact scatter. The prehistoric flake is of unknown cultural or temporal affiliation. The historical artifact assemblage is of unknown temporal affiliation but the diagnostic nails and ceramics recovered date from the early nineteenth century through the twentieth century. Just five of the 20 historical artifacts (25%) recovered represent the Architectural group (the remaining artifacts are from the Domestic and Activities groups) and no structural remains were identified; therefore, it is highly unlikely that this site was a farmstead or residential site but may, instead, simply be a historical trash dump. An affiliation of this resource with Site 15Be671, located on a bench approximately 60 m (197 ft.) upslope, and/or with an 1883 historical residence mapped nearby, is possible. Based on the low density of artifacts and diagnostic material recovered, this site is unlikely to yield new and significant information pertaining to prehistoric or historic cultures in the Outer Bluegrass region of Kentucky. Therefore, Site 15Be670 is not considered eligible for inclusion in the NRHP under Criteria A, B, C, or D and no further work is recommended

State Site No.: 15Be671

Resource Type: Historical Artifact Scatter

Affiliation: Unknown Historical

Topographic Setting: Upland Bench

Elevation: 260 m (850 ft.) AMSL

UTM Coordinates: Zone 16, N4320950 E702964

Diagnostic Artifacts: Historical Ceramics

NRHP Evaluation: Not Eligible

Discussion: Site 15Be671 (Field Site 14-67601-007) is a newly identified archaeological site located in the western portion of Area 6-A (Figure 15). Area 6-A, owned by the Kenton County Airport Board, is located south of the Cincinnati/Kentucky International Airport; it is bordered by residential subdivisions to the west and southwest and by commercial enterprise and roadways on all other sides. The site includes a low-density historical artifact scatter that covers an area measuring approximately 60 by 30 m (196 by 98 ft.), or 1800 m² (0.16 ha, or 0.4 ac.). The site is located on a grassy upland bench approximately 165 m (540 ft.) east of Hazel Drive and 268 m (880 ft.) north of Edge Hill Road. The field also includes patches of secondary growth trees and scrub. Surface visibility was less than 10 percent; therefore, a shovel testing survey method was completed. The nearest water source is an unnamed tributary of Gunpowder Creek, located approximately 207 m (680 ft.) to the south.

The site is characterized by a low-density historical artifact scatter that may date to the nineteenth century. The site was delineated by five positive shovel tests, seven positive radial shovel tests, and two general surface finds (Figure 16). The soil profile was composed of dark grayish-brown (10YR 4/2) silt loam to a depth of 25 cm (10 in.) below surface, underlain with yellowish-brown (10YR 5/6) silty clay loam subsoil.

A total of 52 historical artifacts were recovered (Table 10), including ceramic brick fragments (n=13), window glass (n=4), a machine-cut nail (n=1), and an indeterminate nail (n=1) belonging to the Architectural group. Domestic group materials include whiteware (n=8),

ironstone (n=5), stoneware (n=4), porcelain (n=2), terra cotta (n=2), and glass lamp chimney fragments (n=2). Additional material includes glass vessel fragments (n=3), coal (n=1), slag (n=1), and an unidentified artifact assigned to the Activities group.

Like Site 15Be670, the assemblage from Site 15Be671 also is consistent with an occupation range dating from the mid-nineteenth to the early twentieth century. Diagnostic artifacts used to determine this temporal reference include a machine-cut nail, Albany slip/salt-glazed stoneware, whiteware, and solarized amethyst glass. A single artifact, the machine-cut nail, supports occupation during the mid-nineteenth century; whereas the stoneware, whiteware, and amethyst glass are more consistent with late-nineteenth and early-twentieth century occupation. There is a low density (n=52) of material at this site.

Provenience	Functional Group	Material/Type	Variety/Form	Total
STP AA2	Domestic	Ironstone	Undecorated fragment	1
STP AA2+10W	Architectural	Brick	Ceramic, fragments	2
STP AA2+10W	Domestic	Whiteware	Unidentifiable fragment	1
STP AA3	Domestic	Whiteware	Unidentifiable fragment	3
STP AA3	Domestic	Porcelain	Clear glaze	1
STP BB2	Architectural	Nail	Cut	1
STP BB2	Domestic	Whiteware	Unidentifiable fragment	1
STP BB3	Architectural	Brick	Ceramic, fragments	6
STP BB3	Architectural	Window Glass	Aqua, non-silvered	1
STP BB3	Architectural	Window Glass	Blue, non-silvered	1
STP BB3	Domestic	Ironstone	Unidentifiable fragment	1
STP BB3	Domestic	Terra Cotta	Unglazed	2
STP BB3	Domestic	Glass Lamp Chimney	Colorless	2
STP BB3	Activities	Mineral	Coal	3
STP BB3	Activities	Synthetic	Slag	1
STP CC2	Architectural	Brick	Ceramic, fragment	1
STP CC2	Architectural	Nail	Unidentifiable fragment	1
STP CC2	Domestic	Whiteware	Undecorated	1
STP CC2	Domestic	Stoneware	Salt glazed	1
STP CC2	Activities	Other	Unknown	1
STP CC3	Domestic	Stoneware	Albany slip and salt glaze	1
STP CC3	Domestic	Stoneware	Salt glazed	1
STP CC3+10N	Domestic	Ironstone	Undecorated	1
STP CC3+10N 10W	Architectural	Brick	Ceramic, fragment	1
STP CC3+10N 10W	Architectural	Window Glass	Aqua, non-silvered	2
STP CC3+10N 10W	Domestic	Ironstone	Undecorated	1
STP CC3+10N 10W	Activities	Glass Vessel	Blue, light	1
STP CC3+10N 10W	Activities	Glass Vessel	Amethyst, solarized	1
STP CC3+10N 20W	Architectural	Brick	Ceramic, fragment	3
STP CC3+10N 20W	Domestic	Whiteware	Unidentifiable fragment	1
STP CC3+10N 20W	Activities	Glass Vessel	Blue, light	1
STP CC3+10N 40W	Domestic	Whiteware	Unidentifiable fragment	1
STP CC3+10N 40W	Domestic	Porcelain	Clear glaze	1
STP CC3+10N 50W	Domestic	Ironstone	Undecorated	1
STP CC3+20N 40W	Domestic	Stoneware	Albany slip and salt glaze	1
General Surface	Domestic	Ironstone	Undecorated	1

Provenience	Functional Group	Material/Type	Variety/Form	Total
General Surface	Activities	Glass Vessel	Amethyst, solarized	1
Total				52

Based on the Phase I archaeological investigations, Site 15Be671 consists of a low-density historical artifact scatter. The historical artifact assemblage is of unknown temporal affiliation but diagnostic nail, vessel glass, and ceramics recovered date from the early nineteenth century through the twentieth century. Of the 52 artifacts recovered, 19 (37%) represent the Architectural group (the remaining artifacts are from the Domestic and Activities groups); however, no structural remains were identified at this location. It is possible that these artifacts are associated with the A.G. Fisk residence (or with its removal) that is shown on the 1883 historical map of Florence Precinct (Figure 4), approximately 250 m (820 ft.) to the east. The Fisk residence was no longer extant by the time the 1914 USGS survey was completed, and the land was farmed thereafter. Given the lack of structural evidence, the low artifact density, and the approximately 100 years of farming that has taken place on this land subsequent to the removal of the Fisk residence, this site is unlikely to yield new and significant information pertaining to historic cultures in the Outer Bluegrass region of Kentucky. Therefore, Site 15Be671 is not considered eligible for inclusion in the NRHP under Criteria A, B, C, or D and no further work is recommended.

Isolated Find 1

State Site No.: N/A

Resource Type: Prehistoric Lithic Scatter

Affiliation: Unknown Cultural or Temporal

Topographic Setting: Undissected Upland

Elevation: 293 m (960 ft.) AMSL

UTM Coordinates: Zone 16, N4324792 E704354

Diagnostic Artifacts: None

NRHP Evaluation: Not Eligible

Discussion: Isolated Find 1 (Field Site 14-67601-002) is located in the northeast quadrant of Area 3-B (Figures 11 and 14) adjacent to Delta Road. The site measures approximately 1-by 1-m (3- by 3-ft.) and covers an area of approximately 1 m² (11 ft.²). Fields were grass-covered at the time of survey, and surface visibility was less than 10%; therefore, a shovel testing survey method was completed.

Isolated Find 1 is a very low density prehistoric lithic scatter of unknown cultural or temporal affiliation. The site was delineated by one positive shovel test (STP B13) and characterized by a single prehistoric Class 7 flake fragment made from Paoli chert. Due to the paucity of recovered materials, no state site number was assigned to this resource. The general soil profile was composed of dark yellowish brown (10YR 4/4) silt loam to a depth of 24 cm (9.5 in.) below surface, underlain with yellowish brown (10YR 5/8) silty clay loam subsoil.

Cartographic research shows the location of Isolated Find 1 to be disturbed. A housing development located along Delta Road in 1961 was razed and the landscape graded by 1983. Given the disturbed nature of Area 3-B, it is likely that the context of this artifact has been compromised.

Based on the Phase I archaeological investigations, Isolated Find 1 consists of a single non-diagnostic flake fragment of unknown cultural or temporal affiliation. Due to the paucity of recovered materials, no state site number was assigned to this resource. This very small site would unlikely yield new and significant information pertaining to prehistoric cultures in the Outer Bluegrass region of Kentucky. Therefore, Isolated Find 1 is not considered eligible for inclusion in the NRHP under Criteria A, B, C, or D and no further work is recommended.

Isolated Find 2

State Site No.: N/A

Resource Type: Prehistoric Lithic Scatter

Affiliation: Unknown Cultural or Temporal

Topographic Setting: Undissected Upland

Elevation: 274 m (900 ft.) AMSL

UTM Coordinates: Zone 16, N4324433 E704885

Diagnostic Artifacts: None

NRHP Evaluation: Not Eligible

Discussion: Isolated Find 2 (Field Site 14-67601-004) is located in the eastern corner of Area 3-A (Figures 11 and 12) adjacent to Jamike Avenue. The site measures approximately 1-by 1-m (3- by 3-ft.) and covers an area of approximately 1 m² (11 ft.²). Fields were grass-covered at the time of survey, and surface visibility was less than 10%; therefore, a shovel testing survey method was completed.

Isolated Find 2 is a very low density prehistoric lithic scatter of unknown cultural or temporal affiliation. The site was delineated by one positive shovel test (STP B16+10S) and characterized by a single prehistoric Class 2 flake (unspecified reduction sequence) made from unidentified chert. Due to the paucity of recovered materials, no state site number was assigned to this resource. The general soil profile was composed of dark grayish brown (10YR 4/2) silt loam to a depth of 20 cm (8 in.) below surface, underlain with yellowish brown (10YR 5/6) silty clay loam subsoil.

Based on the Phase I archaeological investigations, Isolated Find 2 consists of a single non-diagnostic flake of unknown cultural or temporal affiliation. Due to the paucity of recovered materials, no state site number was assigned to this resource. This very small site would unlikely yield new and significant information pertaining to prehistoric cultures in the Outer Bluegrass region of Kentucky. Therefore, Isolated Find 2 is not considered eligible for inclusion in the NRHP under Criteria A, B, C, or D and no further work is recommended.

Isolated Find 3**State Site No.:** N/A**Resource Type:** Prehistoric Lithic Scatter**Affiliation:** Unknown Cultural or Temporal**Topographic Setting:** Undissected Upland**Elevation:** 287 m (940 ft.) AMSL**UTM Coordinates:** Zone 16, N4324568 E704547**Diagnostic Artifacts:** None**NRHP Evaluation:** Not Eligible

Discussion: Isolated Find 3 (Field Site 14-67601-005) is located along the northwestern edge of Area 3-A (Figures 11 and 13) adjacent to Mineola Pike. The site measures approximately 1-by 1-m (3- by 3-ft.) and covers an area of approximately 1 m² (11 ft.²). Fields were grass-covered at the time of survey, and surface visibility was less than 10%; therefore, a shovel testing survey method was completed.

Isolated Find 3 is a very low density prehistoric lithic scatter of unknown cultural or temporal affiliation. The site was delineated by one positive shovel test (STP I1) and characterized by a single prehistoric Class 7 flake fragment made from Boyle chert. Due to the paucity of recovered materials, no state site number was assigned to this resource. The general soil profile was composed of dark yellowish brown (10YR 4/4) silt loam to a depth of 23 cm (9 in.) below surface, underlain with yellowish brown (10YR 5/8) silty clay loam subsoil.

Based on the Phase I archaeological investigations, Isolated Find 3 consists of a single non-diagnostic flake fragment of unknown cultural or temporal affiliation. Due to the paucity of recovered materials, no state site number was assigned to this resource. This very small site would unlikely yield new and significant information pertaining to prehistoric cultures in the Outer Bluegrass region of Kentucky. Therefore, Isolated Find 3 is not considered eligible for inclusion in the NRHP under Criteria A, B, C, or D and no further work is recommended.

Isolated Find 4**State Site No.:** N/A**Resource Type:** Prehistoric Lithic Scatter**Affiliation:** Unknown Cultural or Temporal**Topographic Setting:** Undissected Upland**Elevation:** 293 m (960 ft.) AMSL**UTM Coordinates:** Zone 16, N4324721 E704380**Diagnostic Artifacts:** None**NRHP Evaluation:** Not Eligible

Discussion: Isolated Find 4 (Field Site 14-67601-001) is located in the eastern portion of Area 3-B (Figures 11 and 14) near Delta Road. The site measures approximately 1-by 1-m (3- by 3-ft.) and covers an area of approximately 1 m² (11 ft.²). Fields were grass-covered at the time of survey, and surface visibility was less than 10%; therefore, a shovel testing survey method was completed.

Isolated Find 4 is a very low density prehistoric lithic scatter of unknown cultural or temporal affiliation. The site was delineated by one positive shovel test (STP C10) and characterized by a single prehistoric Class 7 flake fragment made from Boyle chert. Due to the paucity of recovered materials, no state site number was assigned to this resource. The general soil profile was composed of dark yellowish brown (10YR 4/4) silt loam to a depth of 36 cm (14 in.) below surface, underlain with yellowish brown (10YR 5/6) silty clay loam subsoil.

Cartographic research shows the location of Isolated Find 4 to be disturbed. A housing development located along Delta Road in 1961 was razed and the landscape graded by 1983. Given the disturbed nature of Area 3-B, it is likely that the context of this artifact has been compromised.

Based on the Phase I archaeological investigations, Isolated Find 4 consists of a single non-diagnostic flake fragment of unknown cultural or temporal affiliation. Due to the paucity of recovered materials, no state site number was assigned to this resource. This very small site would unlikely yield new and significant information pertaining to prehistoric cultures in the Outer Bluegrass region of Kentucky. Therefore, Isolated Find 4 is not considered eligible for inclusion in the NRHP under Criteria A, B, C, or D and no further work is recommended.

7.0 SUMMARY AND RECOMMENDATIONS

Gray & Pape, under contract with the Kenton County Airport Board, completed a Phase I archaeological survey of five parcels of land located adjacent to the Cincinnati/Northern Kentucky International Airport in Boone County, Kentucky. The parcels subjected to Phase I archaeological investigations included Areas 3-A (33 ac.), 3-B (47 ac.), 6-A (64 ac.), 6-B (15 ac.), and 6-C (25.4 ac.). In total, the Phase I investigations covered an area measuring approximately 74.6 ha (184.4 ac.).

Archaeological investigations consisted of a combination of a literature review, walkover reconnaissance, and systematic shovel testing. The literature review shows no previously identified sites located within any of the five parcels. However, the literature review did show that a housing development located within Area 3-B in 1961 was razed and the landscape graded by 1983, thus suggesting that all archaeological finds within this area (Isolated Find 1 and Isolated Find 4) are likely from disturbed contexts. Additionally, an early (1883) historic map shows a residence nearby two newly identified historic sites 15Be670 and 15Be671 in Area 6-A. Diagnostic materials from the sites date to this early time period and, as such, may be associated with the 1883 residence that was razed sometime before 1914 and the land farmed thereafter.

All five project areas were shovel tested at 15-m (49-ft.) intervals; however, walkover survey was conducted in inundated, highly disturbed, and sloped areas. As a result of the survey, two new archaeological sites (15Be670 and 15Be671) and four isolated finds (Isolated Find 1, Isolated Find 2, Isolated Find 3, and Isolated Find 4) were identified.

Isolated Find 1 is located in Area 3-B and consists of a prehistoric flake fragment of unknown cultural or temporal affiliation. Isolated Find 2 is located in Area 3-A and consists of a prehistoric flake of unknown cultural or temporal affiliation. Isolated Find 3 is located in Area 3-A and consists of a prehistoric flake fragment of unknown cultural or temporal affiliation. Isolated Find 4 is located in Area 3-B and consists of a prehistoric flake fragment of unknown cultural or temporal affiliation. Based on the results of the Phase I investigation, these sites are considered not eligible for inclusion in the National Register of Historic Places and no further archaeological investigations are recommended.

Site 15Be670 is located in Area 6-A and consists of a prehistoric isolate of unknown cultural or temporal affiliation and a low-density historical artifact scatter. The historical artifact assemblage indicate an occupation from the early nineteenth through the twentieth century. Given the low quantity of Architectural group artifacts and lack of structural remains, it is highly unlikely that this site was a farmstead or residential site but may, instead, be a trash dump. Affiliation of this site with Site 15Be671, located on a bench upslope, and/or with an 1883 historical residence mapped nearby, is possible. Site 15Be671 is located in Area 6-A and is a low-density historical site. Historical artifacts recovered date from the early nineteenth through the twentieth century. No structural remains were identified at this site; however, it is possible that these artifacts are associated with an 1883 historical residence mapped nearby. This residence was razed sometime between the 1883 and 1914 and the land was farmed thereafter. Neither of these resources appear to possess the integrity required to provide

significant information concerning the historical occupation of the region, and no further work is recommended at either location.

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APPENDIX A
ARTIFACT INVENTORY

Prehistoric Artifact Inventory for Phase I Cultural Resources Survey for Five Parcels (3-A, 3-B, 6-A, 6-B, and 6-C) at the Cincinnati/Northern Kentucky International Airport, Boone County, Kentucky

State/Field Site No.	Field	Collection Type	Transect	Number	Radial	Strat	Class	Type	Material	Ct
Isolated Find 1	3B	Shovel Test	B	13		I	Debitage	Class 7 - Flake Fragment	Paoli	1
Site Ct: 1										
Isolated Find 2	3A	Shovel Test	B	16	10S	I	Debitage	Class 2 - Flake (unspecified reduction sequence)	Unidentified Chert	1
Site Ct: 1										
Isolated Find 3	3A	Shovel Test	I	1		I	Debitage	Class 7 - Flake Fragment	Boyle	1
Site Ct: 1										
Isolated Find 4	3B	Shovel Test	C	10		I	Debitage	Class 7 - Flake Fragment	Boyle	1
Site Ct: 1										
15B3670	6A-3	Shovel Test	V	2		I	Debitage	Class 7 - Flake Fragment	Paoli	1
Site Ct: 1										

Historical Artifact Inventory for Phase I Cultural Resources Survey for Five Parcels (3-A, 3-B, 6-A, 6-B, and 6-C) at the Cincinnati/Northern Kentucky International Airport, Boone County, Kentucky

State/Field Site No.	Field	Collection Type	Transect	Number	Radial	Strat	Material	Form	Manufacture	Type	Variety	Element	Modification	Artifact Group	Ct
15B3670	6A-3	Shovel Test	W	2		I	Ceramic, vessel	unidentifiable fragment	earthenware, refined	pearlware	edgeware, impressed, blue	rim sherd	Eroded/exfoliated	Domestic group	1
15B3670	6A-3	Shovel Test	W	2		I	Ceramic, vessel	unidentifiable fragment	earthenware, refined	unidentified	annular	body sherd		Domestic group	1
15B3670	6A-3	Shovel Test	W	2		I	Ceramic, vessel	unidentifiable fragment	earthenware, refined	whiteware	transferprint, underglaze, green	base, partial	Eroded/exfoliated	Domestic group	1
15B3670	6A-3	Shovel Test	W	2		I	Ceramic, vessel	unidentifiable fragment	stoneware	red paste	salt glazed	body sherd		Domestic group	1
15B3670	6A-3	Shovel Test	W	2		I	Metal	nail	cut	ferrous	10d	complete	Corroded	Architecture group	1
15B3670	6A-3	Shovel Test	W	2	10W	I	Ceramic, brick	unidentifiable fragment	unknown			fragment	Eroded/exfoliated	Architecture group	2
15B3670	6A-3	Shovel Test	W	2	10W	I	Ceramic, vessel	unidentifiable fragment	earthenware, refined	unidentifiable fragment	hand-painted, underglaze	body sherd	Eroded/exfoliated	Domestic group	1
15B3670	6A-3	Shovel Test	W	2	10W	I	Ceramic, vessel	unidentifiable fragment	earthenware, refined	whiteware	undecorated	body sherd		Domestic group	1
15B3670	6A-3	Shovel Test	W	2	10W	I	Ceramic, vessel	unidentifiable fragment	stoneware	gray paste	Albany slip and salt glaze	body sherd		Domestic group	1
15B3670	6A-3	Shovel Test	W	2	10W	I	Ceramic, vessel	unidentifiable fragment	stoneware	gray paste	salt glazed	handle		Domestic group	1
15B3670	6A-3	Shovel Test	W	2	10W	I	Glass, flat	non-silvered, window	unidentified	aqua, light		fragment		Architecture group	1
15B3670	6A-3	Shovel Test	W	2	30W	I	Botanical remains	carbon						Activities group	1
15B3670	6A-3	Shovel Test	W	2	30W	I	Ceramic, vessel	unidentifiable fragment	earthenware, refined	pearlware	edgeware, unscalloped & impressed	rim sherd		Domestic group	2
15B3670	6A-3	Shovel Test	W	2	30W	I	Ceramic, vessel	unidentifiable fragment	earthenware, refined	whiteware	edgeware, unscalloped & impressed	rim sherd		Domestic group	1
15B3670	6A-3	Shovel Test	W	2	30W	I	Faunal remains	bone	natural			unidentified		Domestic group	1
15B3670	6A-3	Shovel Test	W	2	30W	I	Metal	nail	cut, indeterminate	ferrous		partial		Architecture group	1
15B3670	6A-3	Shovel Test	W	2	30W 20S	I	Ceramic, vessel	unidentifiable fragment	earthenware, refined	whiteware	unidentifiable fragment	unidentifiable fragment	Eroded/exfoliated	Domestic group	2
Site Ct: 20															
15Be671	6A-3	General Surf.					Ceramic, vessel	unidentifiable fragment	earthenware, refined	ironstone	undecorated	base, partial		Domestic group	1
15Be671	6A-3	General Surf.					Glass, vessel	unidentified fragment	solarized amethyst	unidentifiable fragment	unidentifiable fragment	body sherd		Activities group	1
15Be671	6A-3	Shovel Test	AA	2		I	Ceramic, vessel	unidentifiable fragment	earthenware, refined	ironstone	undecorated	base, partial		Domestic group	1
15Be671	6A-3	Shovel Test	AA	2	10W	I	Ceramic, brick	unidentifiable fragment	unknown			fragment	Eroded/exfoliated	Architecture group	2
15Be671	6A-3	Shovel Test	AA	2	10W	I	Ceramic, vessel	unidentifiable fragment	earthenware, refined	whiteware	unidentifiable fragment	unidentifiable fragment	Eroded/exfoliated	Domestic group	1
15Be671	6A-3	Shovel Test	AA	3		I	Ceramic, vessel	unidentifiable fragment	earthenware, refined	whiteware	unidentifiable fragment	rim sherd	Burned/melted & Eroded/exfoliated	Domestic group	1

Historical Artifact Inventory for Phase I Cultural Resources Survey for Five Parcels (3-A, 3-B, 6-A, 6-B, and 6-C) at the Cincinnati/Northern Kentucky International Airport, Boone County, Kentucky

State/Field Site No.	Field	Collection Type	Transect	Number	Radial	Strat	Material	Form	Manufacture	Type	Variety	Element	Modification	Artifact Group	Ct
15Be671	6A-3	Shovel Test	AA	3		I	Ceramic, vessel	unidentifiable fragment	earthenware, refined	whiteware	unidentifiable fragment	unidentifiable fragment	Eroded/exfoliated	Domestic group	2
15Be671	6A-3	Shovel Test	AA	3		I	Ceramic, vessel	unidentifiable fragment	porcelain	hard paste	clear glaze	body sherd		Domestic group	1
15Be671	6A-3	Shovel Test	BB	2		I	Ceramic, vessel	unidentifiable fragment	earthenware, refined	whiteware	unidentifiable fragment	unidentifiable fragment	Eroded/exfoliated	Domestic group	1
15Be671	6A-3	Shovel Test	BB	2		I	Metal	nail	cut	ferrous	unknown	partial	Corroded	Architecture group	1
15Be671	6A-3	Shovel Test	BB	3		I	Ceramic, brick	unidentifiable fragment	sand struck			fragment	Eroded/exfoliated	Architecture group	1
15Be671	6A-3	Shovel Test	BB	3		I	Ceramic, brick	unidentifiable fragment	unknown			fragment	Eroded/exfoliated	Architecture group	5
15Be671	6A-3	Shovel Test	BB	3		I	Ceramic, vessel	unidentifiable fragment	earthenware, refined	ironstone	unidentifiable fragment	body sherd	Eroded/exfoliated	Domestic group	1
15Be671	6A-3	Shovel Test	BB	3		I	Ceramic, vessel	unidentifiable fragment	earthenware, refined	terra cotta	unglazed	body sherd	Eroded/exfoliated	Domestic group	2
15Be671	6A-3	Shovel Test	BB	3		I	Glass, flat	non-silvered, window	unidentified	aqua, light		fragment		Architecture group	1
15Be671	6A-3	Shovel Test	BB	3		I	Glass, flat	non-silvered, window	unidentified	blue, light		fragment		Architecture group	1
15Be671	6A-3	Shovel Test	BB	3		I	Glass, other	lamp chimney	unidentified	colorless		fragment		Domestic group	2
15Be671	6A-3	Shovel Test	BB	3		I	Mineral	coal	natural			fragment		Activities group	3
15Be671	6A-3	Shovel Test	BB	3		I	Synthetics	slag	by-product			fragment		Activities group	1
15Be671	6A-3	Shovel Test	CC	2		I	Ceramic, vessel	unidentifiable fragment	stoneware	buff paste	salt glazed	body sherd		Domestic group	1
15Be671	6A-3	Shovel Test	CC	2	10S	I	Ceramic, brick	unidentifiable fragment	unknown			fragment	Eroded/exfoliated	Architecture group	1
15Be671	6A-3	Shovel Test	CC	2	10S	I	Ceramic, vessel	unidentifiable fragment	earthenware, refined	whiteware	undecorated	base, partial	Eroded/exfoliated	Domestic group	1
15Be671	6A-3	Shovel Test	CC	2	10S	I	Metal	nail	unknown	ferrous		fragment	Corroded	Architecture group	1
15Be671	6A-3	Shovel Test	CC	2	10S	I	Other	Unknown					Burned/melted	Activities group	1
15Be671	6A-3	Shovel Test	CC	3		I	Ceramic, vessel	unidentifiable fragment	stoneware	buff paste	Albany slip glaze	base/body sherd		Domestic group	1
15Be671	6A-3	Shovel Test	CC	3		I	Ceramic, vessel	unidentifiable fragment	stoneware	gray paste	salt glazed	body sherd		Domestic group	1
15Be671	6A-3	Shovel Test	CC	3	10N	I	Ceramic, vessel	unidentifiable fragment	earthenware, refined	ironstone	undecorated	base, partial		Domestic group	1
15Be671	6A-3	Shovel Test	CC	3	10N 10W	I	Ceramic, brick	unidentifiable fragment	unknown			fragment	Eroded/exfoliated	Architecture group	1
15Be671	6A-3	Shovel Test	CC	3	10N 10W	I	Ceramic, vessel	unidentifiable fragment	earthenware, refined	ironstone	undecorated	base, partial	Eroded/exfoliated	Domestic group	1

Historical Artifact Inventory for Phase I Cultural Resources Survey for Five Parcels (3-A, 3-B, 6-A, 6-B, and 6-C) at the Cincinnati/Northern Kentucky International Airport, Boone County, Kentucky

State/Field Site No.	Field	Collection Type	Transect	Number	Radial	Strat	Material	Form	Manufacture	Type	Variety	Element	Modification	Artifact Group	Ct
15Be671	6A-3	Shovel Test	CC	3	10N 10W	I	Glass, flat	non-silvered, window	unidentified	aqua, light		fragment		Architecture group	2
15Be671	6A-3	Shovel Test	CC	3	10N 10W	I	Glass, vessel	unidentified	unidentifiable fragment	blue, light	unidentifiable fragment	body sherd		Activities group	1
15Be671	6A-3	Shovel Test	CC	3	10N 10W	I	Glass, vessel	unidentified	unidentifiable fragment	solarized amethyst	unidentifiable fragment	body sherd		Activities group	1
15Be671	6A-3	Shovel Test	CC	3	10N 20W	I	Ceramic, brick	unidentifiable fragment	unknown			fragment	Eroded/exfoliated	Architecture group	3
15Be671	6A-3	Shovel Test	CC	3	10N 20W	I	Ceramic, vessel	unidentifiable fragment	earthenware, refined	whiteware	unidentifiable fragment	unidentifiable fragment	Eroded/exfoliated	Domestic group	1
15Be671	6A-3	Shovel Test	CC	3	10N 20W	I	Glass, vessel	unidentified	unidentifiable fragment	blue, light	unidentifiable fragment	body sherd		Activities group	1
15Be671	6A-3	Shovel Test	CC	3	10N 40W	I	Ceramic, vessel	unidentifiable fragment	earthenware, refined	whiteware	unidentifiable fragment	rim sherd	Eroded/exfoliated	Domestic group	1
15Be671	6A-3	Shovel Test	CC	3	10N 40W	I	Ceramic, vessel	unidentifiable fragment	porcelain	hard paste	clear glaze	rim sherd		Domestic group	1
15Be671	6A-3	Shovel Test	CC	3	10N 50W	I	Ceramic, vessel	unidentifiable fragment	earthenware, refined	ironstone	undecorated	base/body sherd		Domestic group	1
15Be671	6A-3	Shovel Test	CC	3	20N 40W	I	Ceramic, vessel	unidentifiable fragment	stoneware	gray paste	Albany slip and salt glaze	body sherd		Domestic group	1

Site Ct: 52

APPENDIX B
SITE FORMS

Preliminary Form
 Final Form
 New Site
 Repeat Visit

KENTUCKY ARCHAEOLOGICAL SITE SURVEY FORM

Office of State Archaeology

IDENTIFICATION

2		4

County Boone

5		7

State Site No. 15Be670

Site Name _____

Other Site No. _____ Project Site No. Field Site 006

LOCATION

8

1. Coordinate System 1 UTM

2 _____ KPC

Zone if UTM, 16, _____ 17

If KPCS, _____ North, or 2 _____ South

9	10

Northing 4320852

11									17

Easting 702958

18									24

2. Quadrangle Name Burlington, KY

Quadrangle Date 1984

25		27

28	29

3. Reliability of Site Location Information

0 good 1 _____ approximate 2 _____ location unknown

30

OWNERSHIP

Name(s)

Kenton County Airport Board

Address and Phone

Cincinnati/Northern Kentucky International Airport

PO Box 752000

Cincinnati, OH 45275-2000

Tenant (*if any*)

Address and Phone

T E M P O R A L - C U L T U R A L A F F I L I A T I O N S

1. Cultural Periods Represented

45			
32		34	
35			38
39		41	
42			
43			
44			

- Unassigned
- Paleo-Indian, undefined Early Late
- Archaic, undefined Early Middle Late
- Woodland, undefined Early Middle
- Late Woodland/Mississippian
- Historic Indian
- Historic Non-Indian

2. Archaeological Cultures Represented

46			49
50			53
54		56	

- Adena Hopewell Ft. Ancient Stone Grave
- Mississippian Cherokee Pisgah Lost River
- Caborn-Welborn Yankeetown Angel

OTHER (describe) _____

3. How were cultural affiliation and age determined (describe diagnostic artifacts, type names, and attach outline drawings)?

Historic artifact ceramics had production ranges from 1705-1930, 1810-1900, and 1820 to present.

Prehistoric materials collected: 1 total number of items

Type	Number	other scrapers	_____
ceramics	_____	flakes/cores/chunks	<u> 1 </u>
projectile points/fragments	_____	ground/pecked/battered	_____
hafted scrapers/drills	_____	stone	_____
other drills	_____	worked bone/shell	_____
Bifaces/fragments	_____	human bone/burials	_____
unifaces	_____	faunal materials	_____
perforators/gravers	_____		_____
spokeshaves	_____		_____

Prehistoric materials observed but not collected (describe)

8 9

4. Approximate Historic Site Date Range

- | | | |
|--------------------------------------|---|--|
| 1 <input type="checkbox"/> pre 1600 | 6 <input type="checkbox"/> 1701-1750 | 11 <input checked="" type="checkbox"/> 1900-2000 |
| 2 <input type="checkbox"/> 1600-1700 | 7 <input type="checkbox"/> 1751-1800 | 12 <input type="checkbox"/> 1901-1950 |
| 3 <input type="checkbox"/> 1601-1650 | 8 <input checked="" type="checkbox"/> 1801-1900 | 13 <input type="checkbox"/> 1951-2000 |
| 4 <input type="checkbox"/> 1651-1700 | 9 <input type="checkbox"/> 1801-1950 | 14 <input type="checkbox"/> 1851-1950 |
| 5 <input type="checkbox"/> 1701-1800 | 10 <input type="checkbox"/> 1851-1900 | 15 <input type="checkbox"/> 1801-1950 |

Historic materials collected Pearlware, whiteware, stoneware, brick, flat window glass, Machine-cut nails, mammal bone kitchen refuse, wood charcoal (see details in site description, below).

Historic materials observed but not collected _____

PHYSICAL DESCRIPTION

10 11

1. Site Type

- | | |
|---|---|
| 0 <input checked="" type="checkbox"/> undetermined | 10 <input type="checkbox"/> non-mound earthwork |
| 1 <input type="checkbox"/> open habitation w / o mounds | 11 <input type="checkbox"/> workshop |
| 2 <input type="checkbox"/> isolated find | 12 <input type="checkbox"/> isolated burials |
| 3 <input type="checkbox"/> rockshelter | 13 <input type="checkbox"/> cemetery |
| 4 <input type="checkbox"/> cave | 14 <input type="checkbox"/> other special activity area |
| 5 <input type="checkbox"/> quarry | 15 <input type="checkbox"/> open habitation w/ mounds |
| 6 <input type="checkbox"/> stone mound | 16 <input type="checkbox"/> historic farm/residence |
| 7 <input type="checkbox"/> earth mound | 17 <input type="checkbox"/> industrial |
| 8 <input type="checkbox"/> mound complex | 18 <input type="checkbox"/> military |
| 9 <input type="checkbox"/> petroglyph/pictograph | OTHER: _____ |

12

2. Midden

- 0 unknown 1 earth 2 shell 3 absent

13

3. Evidence of recent vandalism (*within the last month*)

- 1 no 2 yes

14

4. Site Condition

- | | |
|---|---|
| 1 <input type="checkbox"/> apparently undisturbed | 5 <input type="checkbox"/> 76-99% disturbed |
| 2 <input checked="" type="checkbox"/> less than 25% disturbed | 6 <input type="checkbox"/> totally destroyed |
| 3 <input type="checkbox"/> 26-50% disturbed | 7 <input type="checkbox"/> disturbed, % unknown |
| 4 <input type="checkbox"/> 51-75% disturbed | |

17 18

5. Major Land Use

- | | | |
|---|--|---|
| 1 <input type="checkbox"/> cultivated | 8 <input type="checkbox"/> modern cemetery | 16 <input type="checkbox"/> 14+15 |
| 2 <input checked="" type="checkbox"/> pasture | 9 <input type="checkbox"/> mining | 17 <input type="checkbox"/> commercial |
| 3 <input type="checkbox"/> woods/forest | 10 <input type="checkbox"/> inundated | 18 <input type="checkbox"/> military |
| 4 <input type="checkbox"/> road/trail | 11 <input type="checkbox"/> industrial | 19 <input type="checkbox"/> logging/ logging related |
| 5 <input type="checkbox"/> ditch/dike/ borrow pit | 12 <input type="checkbox"/> residential | 20 <input checked="" type="checkbox"/> scrub/secondary growth |
| 6 <input type="checkbox"/> landfill | 13 <input type="checkbox"/> recreational | Other _____ |
| 7 <input type="checkbox"/> modern | 14 <input type="checkbox"/> 1+2+3 | |
| | 15 <input type="checkbox"/> 11+12+13 | |

19

6. Amount of ground surface visible (*typically*)

- | | |
|---|--------------------------------------|
| 1 <input checked="" type="checkbox"/> less than 10% | 5 <input type="checkbox"/> poor |
| 2 <input type="checkbox"/> 11-50% | 6 <input type="checkbox"/> fair |
| 3 <input type="checkbox"/> 51-91% | 7 <input type="checkbox"/> good |
| 4 <input type="checkbox"/> 91-100% | 8 <input type="checkbox"/> excellent |

Describe visibility Grass-covered field with patches of secondary growth trees and scrub.

20

7. Physiographic Division

- | | |
|---|--|
| 1 <input type="checkbox"/> Inner Bluegrass | 5 <input type="checkbox"/> Mississippi Plateau |
| 2 <input checked="" type="checkbox"/> Outer Bluegrass | 6 <input type="checkbox"/> Western Coalfields |
| 3 <input type="checkbox"/> Knobs | 7 <input type="checkbox"/> Jackson Purchase |
| 4 <input type="checkbox"/> Cumberland Plateau | |

Landform Type

- | | |
|--|--|
| 1 <input type="checkbox"/> floodplain | 4 <input type="checkbox"/> dissected uplands |
| 2 <input type="checkbox"/> terrace | 5 <input type="checkbox"/> undissected uplands |
| 3 <input checked="" type="checkbox"/> hillside | OTHER _____ |

Locality Type

- | | |
|--|---|
| 1 <input type="checkbox"/> level | 5 <input type="checkbox"/> bluff base |
| 2 <input type="checkbox"/> knoll | 6 <input type="checkbox"/> ridge |
| 3 <input type="checkbox"/> closed | 7 <input checked="" type="checkbox"/> slope |
| 4 <input type="checkbox"/> bluff crest | OTHER _____ |

21

22

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23		25
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26		28
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29		31

8. Soil Association Rossmoyne-Jessup-Lindsay-Ashton

Soil Series Rossmoyne silt loam 6-12 percent slopes

Soil Type Silt loam

Vegetation (*describe*) Grass-covered field with patches of secondary trees/scrub

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32				35
<input type="checkbox"/>				
36				

9. Elevation 830 ft (253 m) AMSL

Slope of Locality

- | | |
|---|---|
| 1 <input type="checkbox"/> less than 5°, flat | 4 <input type="checkbox"/> 26-50° |
| 2 <input checked="" type="checkbox"/> 6-10° | 5 <input type="checkbox"/> greater than 51° bluff (rockshelter) |
| 3 <input type="checkbox"/> 11-25° | |

Slope Direction (*Aspect*)

- | | | |
|--|-------------------------------|-------------------------------|
| 1 <input type="checkbox"/> Flat | 4 <input type="checkbox"/> E | 7 <input type="checkbox"/> SW |
| 2 <input type="checkbox"/> N | 5 <input type="checkbox"/> SE | 8 <input type="checkbox"/> W |
| 3 <input checked="" type="checkbox"/> NE | 6 <input type="checkbox"/> S | 9 <input type="checkbox"/> NW |

37

10. Site Area (m²) 600

Basis for site area estimate

- | | | |
|---|------------------------------------|--|
| 1 <input type="checkbox"/> taped | 3 <input type="checkbox"/> guessed | 5 <input type="checkbox"/> transit/alidade |
| 2 <input checked="" type="checkbox"/> paced | 4 <input type="checkbox"/> range | 6 _____ |

Confident of site boundaries:

- | | |
|-------------------------------|---|
| 1 <input type="checkbox"/> no | 2 <input checked="" type="checkbox"/> yes |
|-------------------------------|---|

48

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38									45
<input type="checkbox"/>	<input type="checkbox"/>								
46	47								

49 50

11. Drainage

- | | | |
|---|--|--|
| 1 <input type="checkbox"/> Mississippi | 6 <input type="checkbox"/> Green | 11 <input type="checkbox"/> Kentucky |
| 2 <input type="checkbox"/> Tennessee | 7 <input type="checkbox"/> Western Ohio | 12 <input type="checkbox"/> Licking |
| 3 <input type="checkbox"/> Lower Cumberland | 8 <input type="checkbox"/> Central Ohio | 13 <input type="checkbox"/> Little Sandy |
| 4 <input type="checkbox"/> Upper Cumberland | 9 <input checked="" type="checkbox"/> Eastern Ohio | 14 <input type="checkbox"/> Big Sandy |
| 5 <input type="checkbox"/> Tradewater | 10 <input type="checkbox"/> Salt | 15 <input type="checkbox"/> Tygarts |

51

Closest Water Source (name) Unnamed tributary of Gunpowder Creek

- | | |
|--|--|
| 1 <input checked="" type="checkbox"/> permanent stream | 4 <input type="checkbox"/> intermittent spring |
| 2 <input type="checkbox"/> intermittent stream | 5 <input type="checkbox"/> lake/pond (historic sites only) |
| 3 <input type="checkbox"/> permanent spring | 6 <input type="checkbox"/> slough/oxbow lake |
| | 7 <input type="checkbox"/> well (historic sites only) |

Rank order of stream nearest site _____

Distance to water from site 85 m (280 ft)

53

53 55

REPORTING INFORMATION

1. Site reported by

- 1 professional/student
- 2 amateur
- 3 other informant

56

2. Investigation type

- 1 reconnaissance (surface survey, may include shovel tests)
- 2 intensive (surface survey and testing)
- 3 excavated
- 4 volunteered

57

3. Institution/person filing report Gray & Pape, Inc.

Site surveyed by P. McGlade

Date recorded 5/2/2014

Time of day _____ Time spent at site _____

58 59

60 62

4. Artifact Repository (name and address where artifacts are curated)

Landowner (Kenton County Airport Board)

Name of curator at repository

5. Photos

- black/white 0 no. of pictures
- color 0 no. of pictures

Name and address of institution where photos are filed

66 67

6. Name and address of local informants

7. Name and address of owners of other collections from site (*attach inventories of private collections.*)

8. Significance Status

- 1 National Register property
- 2 Eligible for National Register
- 3 Nominated to National Register by SHPO
- 4 Considered eligible but not nominated by SHPO
- 5 Inventory site (does not presently meet National Register criteria)
- 6 National Register status not assessed

69

Discuss the potential significance of the site (*does it meet National Register criteria in your opinion? why or why not? upon what evidence have you based your decision?*)

Based on the archaeological investigations, the site consists of a prehistoric isolate and a low-density historic artifact scatter. The prehistoric flake is of unknown cultural or temporal affiliation. The historic artifact assemblage is of unknown temporal affiliation but the ceramics recovered date from the early 19th century through the 20th century. Just four of the 20 historic artifacts recovered represent the Architectural group (the remaining artifacts are from the Domestic and Activities groups) and no structural remains were identified; therefore, it is highly unlikely that this site was a farmstead or residential site but may, instead, simply be a trash dump. Affiliation of this site with 15Be671, located on a bench upslope, is possible. Based on the low density of artifacts and diagnostic material, this site is unlikely to yield new and significant information pertaining to prehistoric or historic cultures in the Outer Bluegrass region of Kentucky. Therefore, the site is not considered eligible for inclusion in the NRHP under Criteria A, B, C, or D and no further work is recommended.

9. References

Picklesimer, John W. and Karen L. Leone
 2014 Phase I Cultural Resources Survey for Five Parcels (3-A, 3-B, 6-A, 6-B, and 6-C)
 at the Cincinnati/Northern Kentucky International Airport, Boone County, Kentucky.
 Prepared for: Kenton County Airport Board, Cincinnati, Ohio.

70

10. Ownership

- | | | |
|---|---|--|
| 1 <input type="checkbox"/> federal | 3 <input type="checkbox"/> local government | 5 <input type="checkbox"/> private |
| 2 <input checked="" type="checkbox"/> state | 4 <input type="checkbox"/> government | 6 <input type="checkbox"/> joint state/federal |

71

11. Special status (*federal, state, county, etc.*)

- | | |
|---------------------------------------|--|
| 1 <input type="checkbox"/> forest | 5 <input type="checkbox"/> wildlife preserve |
| 2 <input type="checkbox"/> park | 6 <input type="checkbox"/> nature preserve |
| 3 <input type="checkbox"/> wilderness | 7 <input type="checkbox"/> military preserve |
| 4 <input type="checkbox"/> wild river | 8 _____ |

DESCRIPTION OF SITE

Give a physical description of the site and its settings, including dimensions, features (with measurements), nature and location of artifacts and concentrations, extent and location of disturbances, etc.

The site (Field Site 006) is located in the western portion of Area 6-A of the Kenton County Airport Board proposed project area. Area 6-A, owned by the Kenton County Airport Board, is located south of the Cincinnati/Kentucky International Airport; it is bordered by residential subdivisions to the west and southwest and by commercial enterprise and roadways on all other sides. The site includes a prehistoric isolate and low-density historic artifact scatter that, combined, cover an area measuring approximately 30 by 20 m (98 by 65 ft.), or 600 m² (0.06 ha or 0.15 ac.). The site is located on a slope in a grass-covered field approximately 135 m (442 ft.) east of Hazel Drive and 173 m (568 ft.) north of Edge Hill Road. The field also includes patches of secondary growth trees and scrub. Surface visibility was less than 10 percent. The nearest water source is an unnamed tributary of Gunpowder Creek, located approximately 85 m (280 ft.) to the south.

The site is characterized by one prehistoric isolate of unknown cultural or temporal affiliation and by a low-density historic artifact scatter that may date to the 19th century. The site was delineated by two positive shovel tests (STP V2 yielded the prehistoric flake and STP W2 yielded historic artifacts) and three positive radial shovel tests (all yielded historic artifacts). The soil profile was composed of dark yellowish-brown (10YR 4/4) silt loam to a depth of 30 cm (12 in.) below surface, underlain with yellowish-brown (10YR 5/6) silty clay loam subsoil.

A total of 21 artifacts were recovered from the site. The prehistoric isolate consists of a Class 7 flake fragment made from Paoli chert. The flake is of unknown cultural or temporal affiliation.

Prehistoric Artifact from Field Site 006, Parcel 6-A.				
Provenience	Artifact Class	Artifact Type	Raw Material	Total
STP V2	Debitage	Class 7 - Flake Fragment	Paoli	1

A total of 20 historic artifacts were recovered; including machine-cut nails (n=2), flat window glass (n=1), and ceramic brick fragments (n=2) belonging to the Architectural group. Domestic group materials include whiteware (n=5), pearlware (n=3), stoneware (n=3), earthenware (n=2), and faunal bone (n=1). Additional material includes a piece of wood charcoal (n=1) assigned to the Activities group. The recovered historical materials date from the early 19th century through the 20th century. No structural remains were identified at this site; however, 1883 historic map evidence shows a residence nearby with which these artifacts could be associated; this is discussed further in the site relationships section, below.

Historic Artifacts from 15B3670, Area 6-A.				
Provenience	Functional Group	Material/Type	Variety/Form	Total
STP W2	Domestic	Pearlware	Impressed, blue	1
STP W2	Domestic	Earthenware	Unidentified	1
STP W2	Domestic	Whiteware	Transfer-print, green	1
STP W2	Domestic	Stoneware	Salt glazed	1
STP W2	Architectural	Nail	Cut	1
STP W2+10W	Domestic	Earthenware	Unidentifiable fragment	1

Historic Artifacts from 15B3670, Area 6-A.				
Provenience	Functional Group	Material/Type	Variety/Form	Total
STP W2+10W	Domestic	Whiteware	Undecorated	1
STP W2+10W	Domestic	Stoneware	Albany slip and salt glaze	1
STP W2+10W	Domestic	Stoneware	Salt glazed	1
STP W2+10W	Architectural	Brick	Ceramic, fragment	2
STP W2+10W	Architectural	Window Glass	Aqua, non-silvered	1
STP W2+30W	Domestic	Pearlware	Unidentifiable fragment	2
STP W2+30W	Domestic	Whiteware	Unidentifiable fragment	1
STP W2+30W	Domestic	Faunal	Bone	1
STP W2+30W	Architectural	Nail	Cut	1
STP W2+30W	Activities	Botanical	Carbon	1
STP W2+30W 20S	Domestic	Whiteware	Unidentifiable fragment	2
Total				20

Discuss the relationship between this site and other known sites in the area in terms of location, physical characteristics, size, etc.

The area surrounding the site, not including the residential areas, has been extensively surveyed and many sites have been identified. Of the sites identified, the nearest (15BE280) is approximately 170 m (560 ft.) to the west. Site 15BE280 is a small (750 m²) Middle Woodland site that was recommended not eligible for the NRHP and no further investigations were done on the site. The 1883 Historic Atlas of Florence Precinct shows a residence belonging to A.G. Fisk approximately 250 m to the east of 15Be670. It is possible that the artifacts recovered are associated with this residence, though perhaps as a trash dump given the low quantity of artifacts in general and, more specifically, the low quantity of Architectural group artifacts. It is also possible that these artifacts are associated with historic site 15Be671, since ceramics recovered are similar in nature and date to the 19th century.

D A T E S

Absolute dates _____

Dating methods _____

_____ Laboratory _____

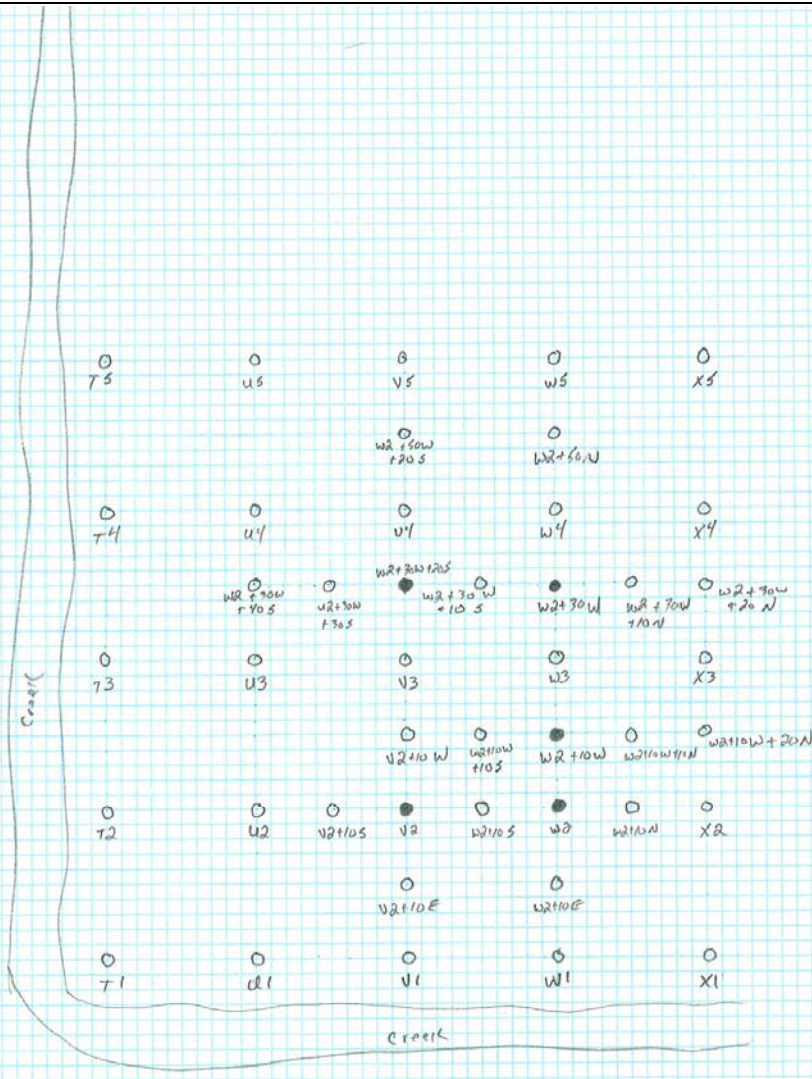
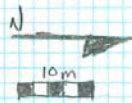
Relative dates _____

References _____

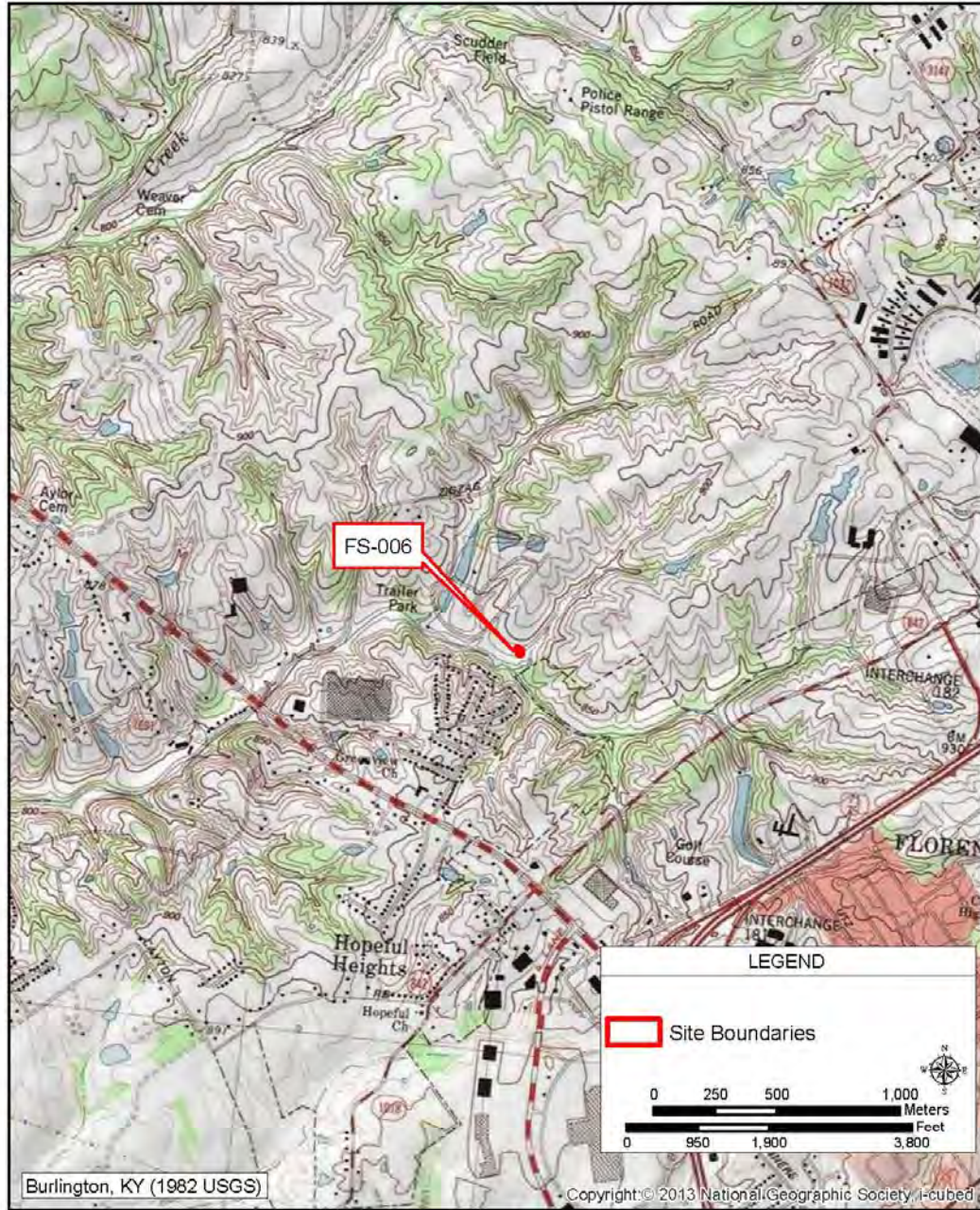
S K E T C H M A P O F S I T E

Include north arrow and scale. Also attach section of U.S.G.S. quad map with site location.

14-67661.001
KcAB
Field CA3
Crew 001
Site 006
PMM
5/2/14



5/16/2014 M:\00_Projects_Yearly\2014\14-67501\Working_CIS\00_Projects\Site_Forms.mxd



Created in ArcGIS 10.1 for Gray & Pape Project 14-67501_001

Location of Field Site 006 in Boone County, KY

- Preliminary Form
- Final Form
- New Site
- Repeat Visit

KENTUCKY ARCHAEOLOGICAL SITE SURVEY FORM

Office of State Archaeology

IDENTIFICATION

2	3	4	5

5	6	7	8

County Boone

State Site No. 15Be671

Site Name _____

Other Site No. _____ Project Site No. Field Site 007

LOCATION

8

9	10

1. Coordinate System 1 UTM

2 _____ KPC

Zone if UTM, 16, _____ 17

If KPCS, _____ North, or 2 _____ South

 Northing 702964

 Easting 4320950

11	12	13	14	15	16	17	18	19	20

18	19	20	21	22	23	24	25	26	27

2. Quadrangle Name Burlington, KY

 Quadrangle Date 1984

25	26	27

28	29

3. Reliability of Site Location Information

0 good 1 _____ approximate 2 _____ location unknown

OWNERSHIP

Name(s)
Kenton County Airport Board

Address and Phone
Cincinnati/Northern Kentucky International Airport

PO Box 752000

Cincinnati, OH 45275-2000

Tenant (*if any*)

Address and Phone

T E M P O R A L - C U L T U R A L A F F I L I A T I O N S

1. Cultural Periods Represented

45
32
34
35
38
39
41
42
43
44

- Unassigned
 Paleo-Indian, undefined Early Late
 Archaic, undefined Early Middle Late
 Woodland, undefined Early Middle
 Late Woodland/Mississippian
 Historic Indian
 Historic Non-Indian

2. Archaeological Cultures Represented

46
49
50
53
54
56

- Adena Hopewell Ft. Ancient Stone Grave
 Mississippian Cherokee Pisgah Lost River
 Caborn-Welborn Yankeetown Angel

OTHER (describe) _____

3. How were cultural affiliation and age determined (describe diagnostic artifacts, type names, and attach outline drawings)?

Historic artifact ceramics had production ranges from 1820 to present.

Prehistoric materials collected: _____ total number of items

Type	Number	other scrapers	_____
ceramics	_____	flakes/cores/chunks	_____
projectile points/fragments	_____	ground/pecked/battered	_____
hafted scrapers/drills	_____	stone	_____
other drills	_____	worked bone/shell	_____
Bifaces/fragments	_____	human bone/burials	_____
unifaces	_____	faunal materials	_____
perforators/gravers	_____		_____
spokeshaves	_____		_____

Prehistoric materials observed but not collected (describe)

8 9

4. Approximate Historic Site Date Range

- | | | |
|--------------------------------------|---|--|
| 1 <input type="checkbox"/> pre 1600 | 6 <input type="checkbox"/> 1701-1750 | 11 <input checked="" type="checkbox"/> 1900-2000 |
| 2 <input type="checkbox"/> 1600-1700 | 7 <input type="checkbox"/> 1751-1800 | 12 <input type="checkbox"/> 1901-1950 |
| 3 <input type="checkbox"/> 1601-1650 | 8 <input checked="" type="checkbox"/> 1801-1900 | 13 <input type="checkbox"/> 1951-2000 |
| 4 <input type="checkbox"/> 1651-1700 | 9 <input type="checkbox"/> 1801-1950 | 14 <input type="checkbox"/> 1851-1950 |
| 5 <input type="checkbox"/> 1701-1800 | 10 <input type="checkbox"/> 1851-1900 | 15 <input type="checkbox"/> 1801-1950 |

Historic materials collected Porcelain, whiteware, ironstone, stoneware, terra cotta, brick, machine-cut nail, indeterminate nail, flat window glass, glass lamp chimney, vessel glass (light blue and amethyst), coal, and slag (see details in site description, below).

Historic materials observed but not collected _____

PHYSICAL DESCRIPTION

10 11

1. Site Type

- | | |
|---|---|
| 0 <input checked="" type="checkbox"/> undetermined | 10 <input type="checkbox"/> non-mound earthwork |
| 1 <input type="checkbox"/> open habitation w / o mounds | 11 <input type="checkbox"/> workshop |
| 2 <input type="checkbox"/> isolated find | 12 <input type="checkbox"/> isolated burials |
| 3 <input type="checkbox"/> rockshelter | 13 <input type="checkbox"/> cemetery |
| 4 <input type="checkbox"/> cave | 14 <input type="checkbox"/> other special activity area |
| 5 <input type="checkbox"/> quarry | 15 <input type="checkbox"/> open habitation w/ mounds |
| 6 <input type="checkbox"/> stone mound | 16 <input type="checkbox"/> historic farm/residence |
| 7 <input type="checkbox"/> earth mound | 17 <input type="checkbox"/> industrial |
| 8 <input type="checkbox"/> mound complex | 18 <input type="checkbox"/> military |
| 9 <input type="checkbox"/> petroglyph/pictograph | OTHER: _____ |

12

2. Midden

- 0 unknown 1 earth 2 shell 3 absent

13

3. Evidence of recent vandalism (*within the last month*)

- 1 no 2 yes

14

4. Site Condition

- | | |
|---|---|
| 1 <input type="checkbox"/> apparently undisturbed | 5 <input type="checkbox"/> 76-99% disturbed |
| 2 <input checked="" type="checkbox"/> less than 25% disturbed | 6 <input type="checkbox"/> totally destroyed |
| 3 <input type="checkbox"/> 26-50% disturbed | 7 <input type="checkbox"/> disturbed, % unknown |
| 4 <input type="checkbox"/> 51-75% disturbed | |

17 18

5. Major Land Use

- | | | |
|---|--|---|
| 1 <input type="checkbox"/> cultivated | 8 <input type="checkbox"/> modern cemetery | 16 <input type="checkbox"/> 14+15 |
| 2 <input checked="" type="checkbox"/> pasture | 9 <input type="checkbox"/> mining | 17 <input type="checkbox"/> commercial |
| 3 <input type="checkbox"/> woods/forest | 10 <input type="checkbox"/> inundated | 18 <input type="checkbox"/> military |
| 4 <input type="checkbox"/> road/trail | 11 <input type="checkbox"/> industrial | 19 <input type="checkbox"/> logging/ logging related |
| 5 <input type="checkbox"/> ditch/dike/ borrow pit | 12 <input type="checkbox"/> residential | 20 <input checked="" type="checkbox"/> scrub/secondary growth |
| 6 <input type="checkbox"/> landfill | 13 <input type="checkbox"/> recreational | Other _____ |
| 7 <input type="checkbox"/> modern | 14 <input type="checkbox"/> 1+2+3 | |
| | 15 <input type="checkbox"/> 11+12+13 | |

49 50

11. Drainage

- | | | |
|---|--|--|
| 1 <input type="checkbox"/> Mississippi | 6 <input type="checkbox"/> Green | 11 <input type="checkbox"/> Kentucky |
| 2 <input type="checkbox"/> Tennessee | 7 <input type="checkbox"/> Western Ohio | 12 <input type="checkbox"/> Licking |
| 3 <input type="checkbox"/> Lower Cumberland | 8 <input type="checkbox"/> Central Ohio | 13 <input type="checkbox"/> Little Sandy |
| 4 <input type="checkbox"/> Upper Cumberland | 9 <input checked="" type="checkbox"/> Eastern Ohio | 14 <input type="checkbox"/> Big Sandy |
| 5 <input type="checkbox"/> Tradewater | 10 <input type="checkbox"/> Salt | 15 <input type="checkbox"/> Tygarts |

51

Closest Water Source (*name*) Unnamed tributary of Gunpowder Creek

- | | |
|--|---|
| 1 <input checked="" type="checkbox"/> permanent stream | 4 <input type="checkbox"/> intermittent spring |
| 2 <input type="checkbox"/> intermittent stream | 5 <input type="checkbox"/> lake/pond (<i>historic sites only</i>) |
| 3 <input type="checkbox"/> permanent spring | 6 <input type="checkbox"/> slough/oxbow lake |
| | 7 <input type="checkbox"/> well (<i>historic sites only</i>) |

53

53 55

Rank order of stream nearest site _____

Distance to water from site 190 m (625 ft)

R E P O R T I N G I N F O R M A T I O N

56

1. Site reported by
- 1 professional/student
 - 2 amateur
 - 3 other informant

57

2. Investigation type
- 1 reconnaissance (*surface survey, may include shovel tests*)
 - 2 intensive (*surface survey and testing*)
 - 3 excavated
 - 4 volunteered

58 59

3. Institution/person filing report Gray & Pape, Inc.

Site surveyed by P. McGlade

Date recorded 5/2 – 5/3/2014

Time of day _____ Time spent at site _____

60 62

4. Artifact Repository (*name and address where artifacts are curated*)

Landowner (Kenton County Airport Board)

Name of curator at repository _____

66 67

5. Photos

black/white _____ no. of pictures

color 1 no. of pictures

Name and address of institution where photos are filed

Gray & Pape, Inc.

1318 Main St., Cincinnati, OH 45202

6. Name and address of local informants

7. Name and address of owners of other collections from site (*attach inventories of private collections.*)

8. Significance Status

- 1 National Register property
- 2 Eligible for National Register
- 3 Nominated to National Register by SHPO
- 4 Considered eligible but not nominated by SHPO
- 5 Inventory site (does not presently meet National Register criteria)
- 6 National Register status not assessed

69

Discuss the potential significance of the site (*does it meet National Register criteria in your opinion? why or why not? upon what evidence have you based your decision?*)

Based on the archaeological investigations, the site consists of a low-density historic artifact scatter. The historic artifact assemblage is of unknown temporal affiliation but ceramics recovered date from the early 19th century through the 20th century. Of the 52 artifacts recovered, 19 (37%) represent the Architectural group (the remaining artifacts are from the Domestic and Activities groups), however, no structural remains were identified at this location. It is possible that these artifacts are associated with the A.G. Fisk residence that is shown on the 1883 historical map of Florence Precinct at approximately 250-300 m to the east. In fact, it is possible that the 1883 map is inaccurate and that this artifact scatter is what remains of the residence at this location. The Fisk residence was no longer extant by the time the 1914 USGS survey was completed. Given the lack of physical evidence of a structure, the low artifact density, and the approximately 100 years of farming that has taken place on this land since the Fisk residence was standing, this site is unlikely to yield new and significant information pertaining to historic cultures in the Outer Bluegrass region of Kentucky. Therefore, the site is not considered eligible for inclusion in the NRHP under Criteria A, B, C, or D and no further work is recommended.

9. References

Picklesimer, John W. and Karen L. Leone
 2014 Phase I Cultural Resources Survey for Five Parcels (3-A, 3-B, 6-A, 6-B, and 6-C)
 at the Cincinnati/Northern Kentucky International Airport, Boone County, Kentucky.
 Prepared for: Kenton County Airport Board, Cincinnati, Ohio.

70

10. Ownership

- | | | |
|---|---|--|
| 1 <input type="checkbox"/> federal | 3 <input type="checkbox"/> local government | 5 <input type="checkbox"/> private |
| 2 <input checked="" type="checkbox"/> state | 4 <input type="checkbox"/> government | 6 <input type="checkbox"/> joint state/federal |

71

11. *Special status (federal, state, county, etc.)*

- | | |
|---------------------------------------|--|
| 1 <input type="checkbox"/> forest | 5 <input type="checkbox"/> wildlife preserve |
| 2 <input type="checkbox"/> park | 6 <input type="checkbox"/> nature preserve |
| 3 <input type="checkbox"/> wilderness | 7 <input type="checkbox"/> military preserve |

4 _____ wild river 8 _____

DESCRIPTION OF SITE

Give a physical description of the site and its settings, including dimensions, features (with measurements), nature and location of artifacts and concentrations, extent and location of disturbances, etc.

The site (Field Site 007) is located in the western portion of Area 6-A of the Kenton County Airport Board proposed project area. Area 6-A, owned by the Kenton County Airport Board, is located south of the Cincinnati/Kentucky International Airport; it is bordered by residential subdivisions to the west and southwest and by commercial enterprise and roadways on all other sides. The site includes a low-density historic artifact scatter that covers an area measuring approximately 60 by 30 m (196 by 98 ft.), or 1800 m² (0.16 ha or 0.4 ac.). The site is located on a bench of sloped grass-covered field approximately 165 m (540 ft.) east of Hazel Drive and 268 m (880 ft.) north of Edge Hill Road. The field also includes patches of secondary growth trees and scrub. Surface visibility was less than 10 percent. The nearest water source is an unnamed tributary of Gunpowder Creek, located approximately 207 m (680 ft.) to the south.

The site is characterized by a low-density historic artifact scatter that may date to the 19th century. The site was delineated by five positive shovel tests, seven positive radial shovel tests, and two general surface finds. The soil profile was composed of dark grayish-brown (10YR 4/2) silt loam to a depth of 25 cm (10 in.) below surface, underlain with yellowish-brown (10YR 5/6) silty clay loam subsoil.

A total of 52 historic artifacts were recovered; including ceramic brick fragments (n=13), window glass (n=4), machine-cut nail (n=1), and indeterminate nail (n=1) belonging to the Architectural group. Domestic group materials include whiteware (n=8), ironstone (n=5), stoneware (n=4), porcelain (n=2), terra cotta (n=2), and glass lamp chimney (n=2). Additional material includes glass vessel fragments (n=3), coal (n=1), slag (n=1), and an unidentified artifact assigned to the Activities group. The recovered materials date from the early 19th century through the 20th century. No structural remains were identified at this site; however, it is possible that these artifacts are associated with the A.G. Fisk residence shown on the 1883 historical map of Florence Precinct. The Fisk residence was no longer extant by the time the 1914 USGS survey was completed; the land was farmed thereafter.

Historic Artifacts from Field Site 007, Parcel 6-A.				
Provenience	Functional Group	Material/Type	Variety/Form	Total
STP AA2	Domestic	Ironstone	Undecorated fragment	1
STP AA2+10W	Architectural	Brick	Ceramic, fragments	2
STP AA2+10W	Domestic	Whiteware	Unidentifiable fragment	1
STP AA3	Domestic	Whiteware	Unidentifiable fragment	3
STP AA3	Domestic	Porcelain	Clear glaze	1
STP BB2	Architectural	Nail	Cut	1
STP BB2	Domestic	Whiteware	Unidentifiable fragment	1
STP BB3	Architectural	Brick	Ceramic, fragments	6
STP BB3	Architectural	Window Glass	Aqua, non-silvered	1
STP BB3	Architectural	Window Glass	Blue, non-silvered	1
STP BB3	Domestic	Ironstone	Unidentifiable fragment	1
STP BB3	Domestic	Terra Cotta	Unglazed	2
STP BB3	Domestic	Glass Lamp Chimney	Colorless	2
STP BB3	Activities	Mineral	Coal	3
STP BB3	Activities	Synthetic	Slag	1
STP CC2	Architectural	Brick	Ceramic, fragment	1
STP CC2	Architectural	Nail	Unidentifiable fragment	1
STP CC2	Domestic	Whiteware	Undecorated	1
STP CC2	Domestic	Stoneware	Salt glazed	1

Historic Artifacts from Field Site 007, Parcel 6-A.				
Provenience	Functional Group	Material/Type	Variety/Form	Total
STP CC2	Activities	Other	Unknown	1
STP CC3	Domestic	Stoneware	Albany slip and salt glaze	1
STP CC3	Domestic	Stoneware	Salt glazed	1
STP CC3+10N	Domestic	Ironstone	Undecorated	1
STP CC3+10N 10W	Architectural	Brick	Ceramic, fragment	1
STP CC3+10N 10W	Architectural	Window Glass	Aqua, non-silvered	2
STP CC3+10N 10W	Domestic	Ironstone	Undecorated	1
STP CC3+10N 10W	Activities	Glass Vessel	Blue, light	1
STP CC3+10N 10W	Activities	Glass Vessel	Amethyst, solarized	1
STP CC3+10N 20W	Architectural	Brick	Ceramic, fragment	3
STP CC3+10N 20W	Domestic	Whiteware	Unidentifiable fragment	1
STP CC3+10N 20W	Activities	Glass Vessel	Blue, light	1
STP CC3+10N 40W	Domestic	Whiteware	Unidentifiable fragment	1
STP CC3+10N 40W	Domestic	Porcelain	Clear glaze	1
STP CC3+10N 50W	Domestic	Ironstone	Undecorated	1
STP CC3+20N 40W	Domestic	Stoneware	Albany slip and salt glaze	1
General Surface	Domestic	Ironstone	Undecorated	1
General Surface	Activities	Glass Vessel	Amethyst, solarized	1
Total				52

Discuss the relationship between this site and other known sites in the area in terms of location, physical characteristics, size, etc.

The area surrounding the site, not including the residential areas, has been extensively surveyed and many sites have been identified. Of the sites identified, the nearest (15BE280) is approximately 228 m (746 ft.) to the southwest. Site 15BE280 is a small (750 m²) Middle Woodland site that was recommended not eligible for the NRHP and no further investigations were done on the site. The 1883 Historic Atlas of Florence Precinct shows a residence belonging to A.G. Fisk approximately 250-300 m to the east of 15Be671. It is possible that the artifacts recovered are associated with this residence. Furthermore, it is also possible that the low-density historical artifact scatter from site 15Be670 is also associated with site 15Be671 and the Fisk residence, since ceramics recovered are similar in nature and date to the 19th century.

D A T E S

Absolute dates

Dating methods

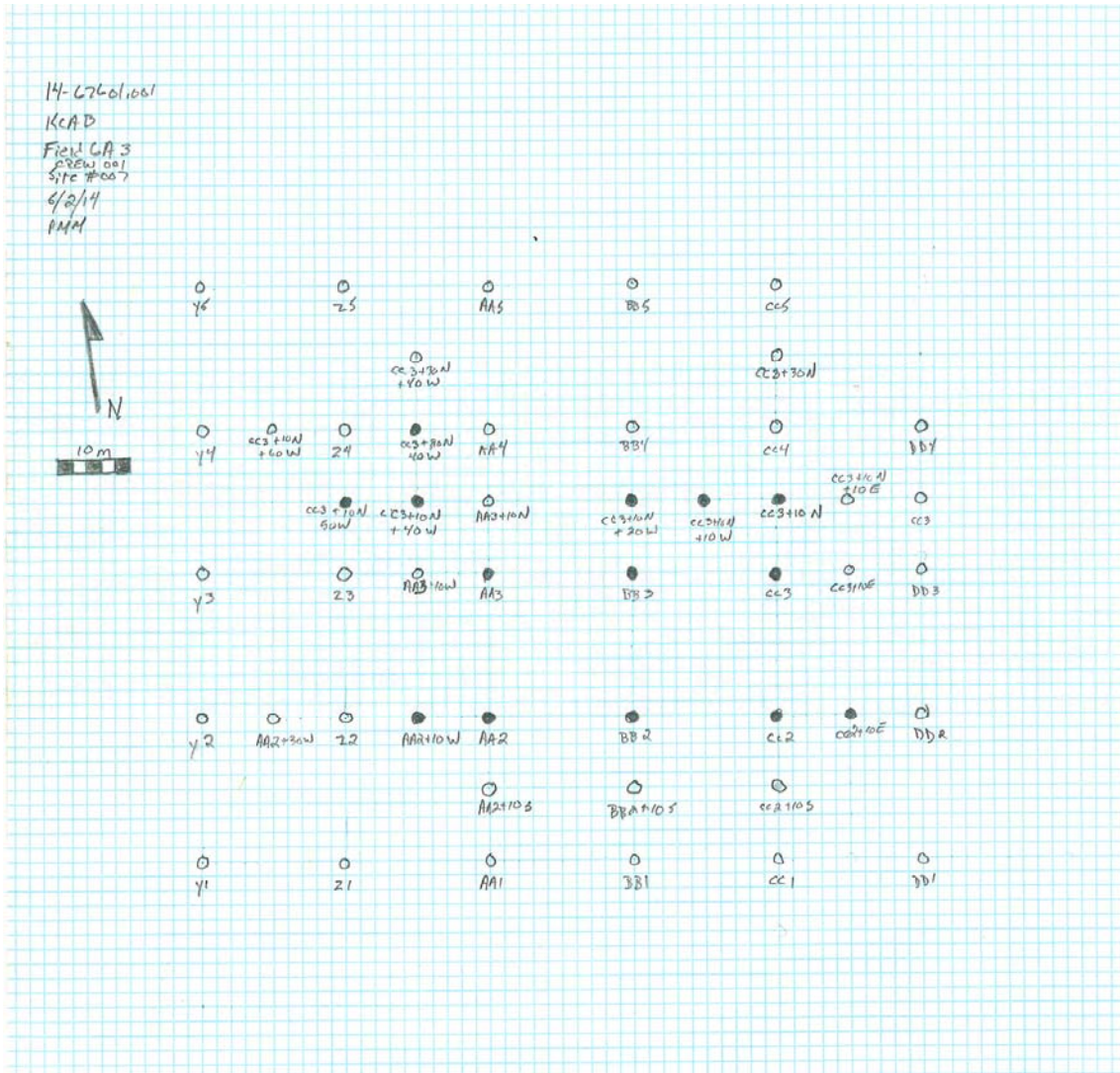
Laboratory _____

Relative dates _____

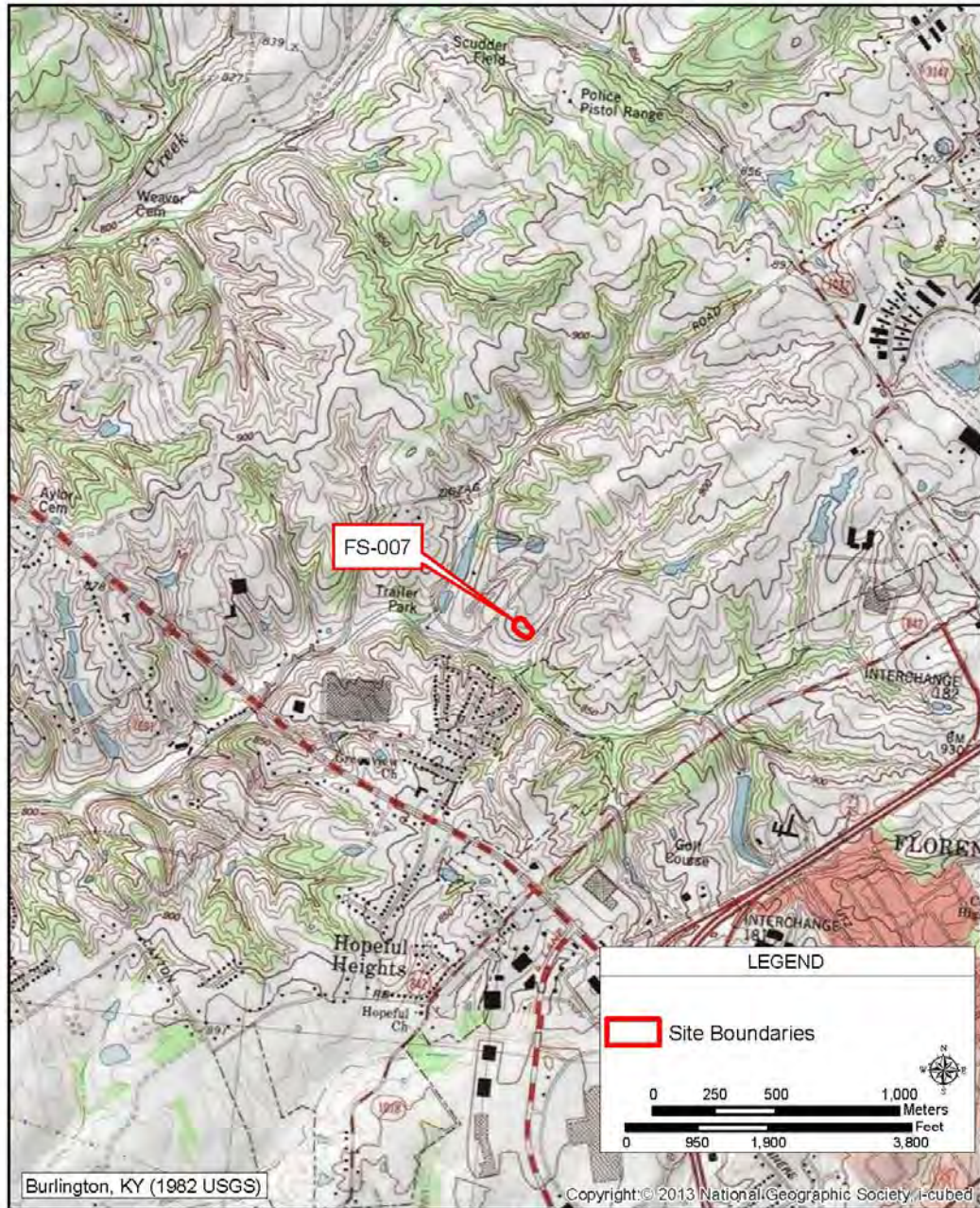
References _____

SKETCH MAP OF SITE

Include north arrow and scale. Also attach section of U.S.G.S. quad map with site location.



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Location of Field Site 007 in Boone County, KY

GRAY & PAPE, INC.
ARCHAEOLOGY · HISTORY · HISTORIC PRESERVATION

Created in ArcGIS 10.1 for Gray & Pape Project 14-67501_001

Project No. E&A-1564
FY#10-6479

July 2010

**ABBREVIATED
PHASE I ARCHAEOLOGY REPORT FOR THE
PROPOSED KENTON COUNTY AIRPORT
EXPANSION OF ZF LENKSYSTEME CAMPUS
AND SEPARATE COMMERCIAL DEVELOPMENT
PROJECT, BURLINGTON, BOONE COUNTY
KENTUCKY**

Lead Federal Agency:
Federal Aviation Administration

Prepared for:


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Attention: Debbie Conrad

Prepared by:

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Andrea Crider
Principal Investigator



Luke W. Erickson, M.A.
Principal Investigator

ABSTRACT

The Kenton County Airport Board (KCAB) proposes to lease up to 55-acres of land for commercial development. The Proposed Project includes the development and operation of two manufacturing facilities as part of the expansion of ZF Lenksysteme campus and a separate commercial development. ZF Lenksysteme currently owns and operates an existing facility adjacent to the proposed development site located on the southern property boundary of the Cincinnati/Northern Kentucky International Airport (CVG) located in Boone County, Kentucky. The commercial development would be located on a site immediately west of the primary ZF Lenksysteme development.

The Proposed Project area consisted of an approximate 11-acre and 44-acre parcel, located within heavily wooded areas and fallow agricultural fields within the boundaries of the Cincinnati/Northern Kentucky Airport. The project area lies within the Outer Bluegrass Physiographic Province of the Middle Ohio-Laughery watershed. The nearest mapped water is an unnamed tributary to Gunpowder Creek which runs near the southwest corner of the project area.

This report provides details of the Phase I archaeology survey of the Proposed Project area. Shovel tests were excavated within the entire project area. No historic structures visible within the project area or within the project area's viewshed. A single historic Isolated Artifact Find was identified during the course of the field survey. Based upon the singular nature of the isolated find and the lack of any supporting cultural context, this Isolated Find does not appear to have the potential to contribute to our understanding of either the history or prehistory of the area. Therefore, it is unlikely that further archaeological studies would result in the collection of meaningful data relating to the history or prehistory of the project area. It is the recommendation of *Environment & Archaeology, LLC* that no additional historical or archaeological survey work is needed for this project area and further consultation under Section 106 of the National Historic Preservation Act is not needed.

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INTRODUCTION

The Kenton County Airport Board (KCAB) proposes to lease land for commercial development within the southern boundary of the Cincinnati/Northern Kentucky International Airport (CVG) in Boone County, Kentucky (Figure 1). The Proposed Project includes the development and operation of two manufacturing facilities as part of the expansion of the ZF Lenksysteme campus and a separate commercial development within two parcels, consisting of up to 55-acres of land (Figure 2). ZF Lenksysteme currently owns and operates an existing facility adjacent to the proposed development site. The commercial development would be located on a site immediately west of the primary ZF Lenksysteme development. The project area totals approximately 55 acres (22.2 hectares).

Area of Potential Effect: For archaeological resources, the Area of Potential Effect (APE) will be limited to those areas where construction-related activities will occur. This includes the entire 55 acre (22.2 hectare) project area.

This report details the background research, survey results, and recommendations resulting from a Phase I archaeology survey conducted for the Kenton County Airport Board. Rob Adams of Landrum and Brown requested *Environment and Archaeology, LLC* to perform a Phase I Survey of the area potentially disturbed by the proposed construction.

The Phase I field investigation was conducted in July 2010. The Field Director for this project was Douglas Whitlatch and Luke Erickson. Project oversight was the responsibility of Principal Investigators Andrea Crider, M.A. and Luke W. Erickson, M.A. The primary author for this report was Luke W. Erickson, M.A. The curriculum vita of project principals are found in Appendix A.

This work was conducted under the authority of the National Historic Preservation Act of 1966 (PL 89-665), the National Environmental Policy Act of 1969 (PL 91-190), Executive Order 11593, the Archaeological and Historic Preservation Act of 1974 (PL 93-291), and the Protection of Historic Cultural Properties (36 CFR 800).

Disposition of the field notes, photographs, and other materials associated with this project is at the *Environment & Archaeology, LLC* laboratory.

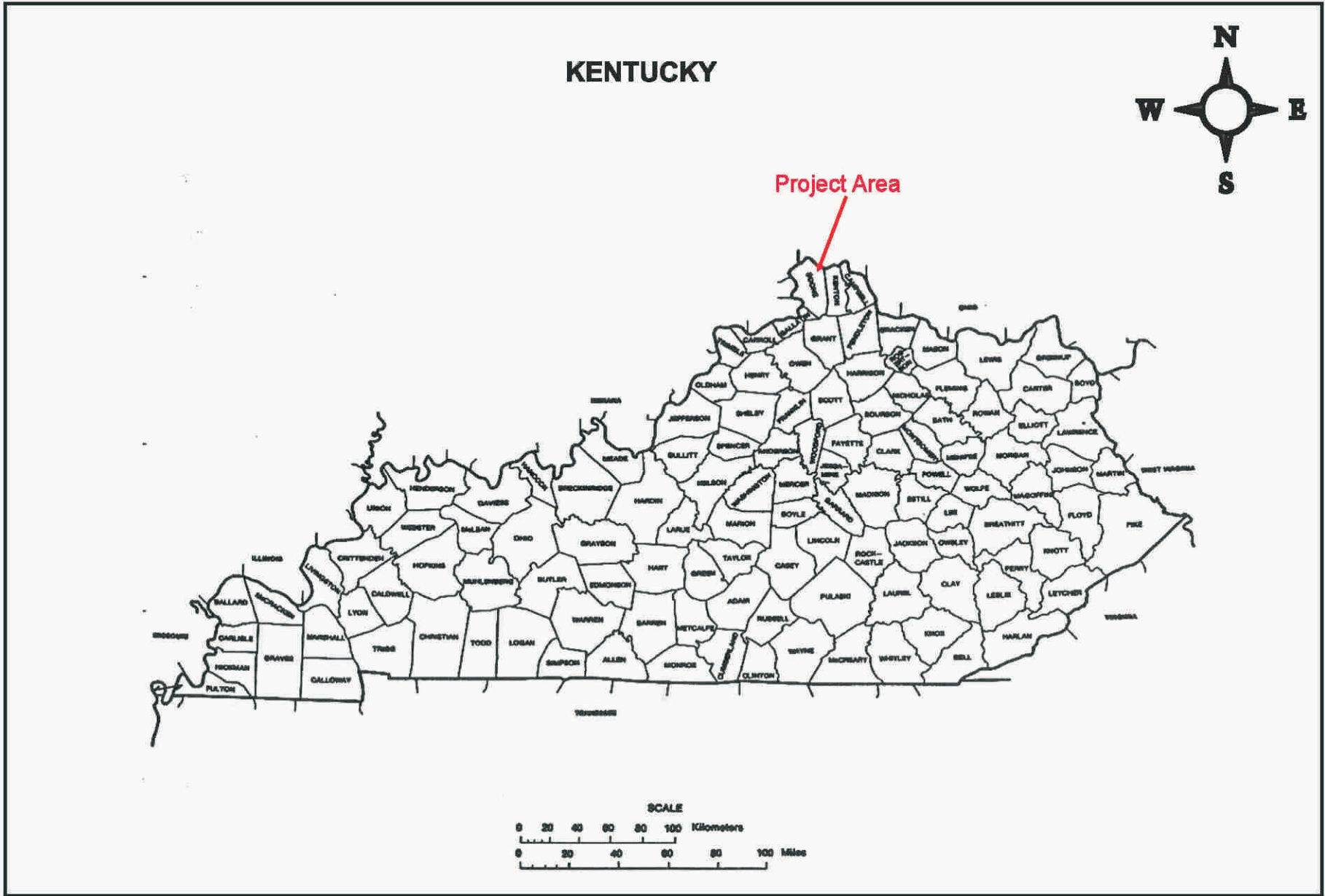
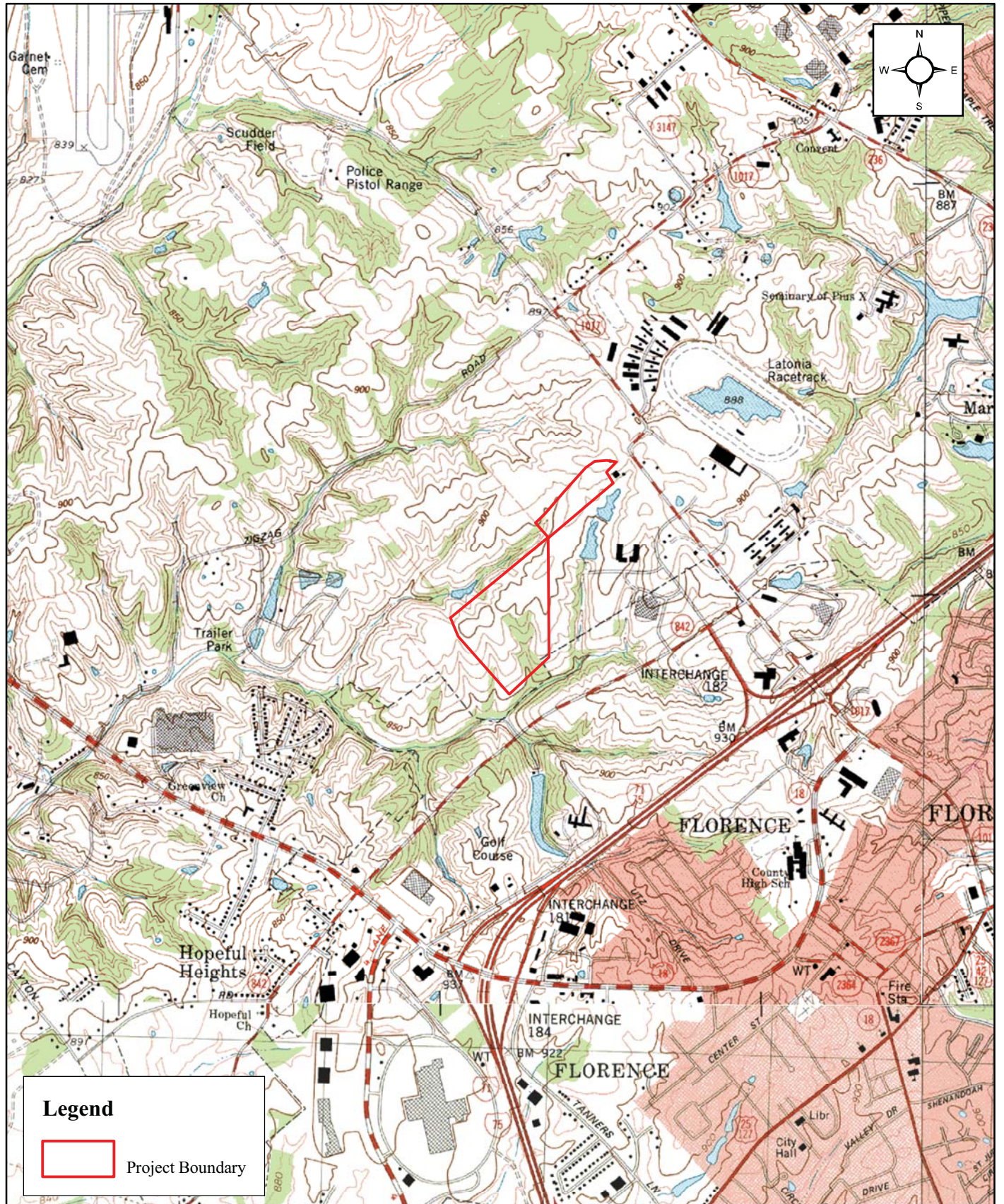


Figure 1. State Map of Kentucky Showing the Project Location.



Legend

 Project Boundary

Figure 2

Kenton County Airport Board
 Cincinnati/Northern Kentucky International Airport
 Expansion of ZF Lenksysteme Campus and
 Separate Commercial Development Project Location
 Boone County, Kentucky

USGS 7.5' Topographic Map with NWI Overlay
 Burlington, Kentucky, Quadrangle
 1:24,000
 Environment and Archaeology, LLC

CULTURAL RESOURCE SENSITIVITY

SITE FILE SEARCH

A Literature Review was conducted in June 2010 by *Environment & Archaeology, LLC* to determine the presence of known archaeological sites within the project areas and to help evaluate the potential for the project area to contain cultural deposits. As part of the Literature Review, *Environment & Archaeology, LLC* reviewed the site files at the Office of the State Archaeologist (OSA) in Lexington, Kentucky. No previously recorded archaeological sites or historic structures were located within or immediately adjacent to the project area. The literature search identified a total of fifty-five previously identified sites within a 2-kilometer (1.2-mile) radius of the project area (Table 1). Twelve archaeological surveys have been previously conducted within the 1.2-mile (2-kilometer) radius of the current project area. The surveys are discussed below.

Bybee, Alexandra D. And Lori O'Conner

2007 *An Archaeological Survey of the Proposed South Airfield Road, Boone County, Kentucky (Item No. 6-193.00)*. Prepared for HMB Professional Engineers, Inc. Prepared by Cultural Resource Analysts, Inc, 008-151.

This survey area consisted of 128.5 acres of three alternates and three connectors for the proposed South Airfield Road in Boone County, Kentucky. Two previously recorded archaeological sites were reinvestigated. Two isolated archaeological finds were also located. The sites were recommended not eligible for listing on the National Register of Historic Places (NRHP) and further work was not recommended for this project area.

Thiel, Barbara

1981 *An Archaeological Survey of the Proposed Florence Sewage Treatment Plant Area*. Prepared for Cardinal Engineering Company. Prepared by Northern Kentucky University, 008-026.

An archaeological survey was conducted in Florence, Kentucky where a 3.5 mile proposed sewer line and sewage treatment plant was proposed to be constructed. One archaeological site was located where the sewage treatment plant will be constructed. It was not assessed to determine if potentially eligible for National Register for Historic Places (NRHP).

Gray, Marlesa A.

1982 *Cultural Resources Survey of 3.6 Miles of Sewer Line Corridor Near Limaburg, Boone County*. Prepared for Cardinal Engineering Company. Prepared by Northern Kentucky University, 008-033.

This survey was conducted between Florence, Kentucky and Burlington, Kentucky where a proposed 3.6 mile sewer line was to be constructed by the City of Florence Water and Sewer Commission. Seven archaeological sites were located as well as two more possible sites within the proposed area. More testing was recommended to determine whether the sites were potentially eligible for inclusion

in the National Register of Historic Places (NRHP).

Gray, Marlesa A.

1982 *Cultural Resources Reconnaissance of the Dilcrest and Hopeful Heights Sewer Line Corridors, Boone County, Kentucky*. Prepared for Cardinal Engineering Company. Prepared by Northern Kentucky University, 008-037.

This survey included two proposed sewer line corridors located west of Florence, Kentucky, in Boone County. The first line was to be located in the Hopeful Heights area and measured 3.15 km in length. The second sewer line was to be constructed in the Dilcrest subdivision and measured 2.9 km long. Both lines were to be constructed by the City of Florence Water and Sewer Commission. Two archaeological sites were located. More testing was recommended to determine whether the sites were potentially eligible for inclusion in the National Register of Historic Places (NRHP).

Broida, Mary O.

1983 *A Cultural Resource Assessment of 12.4 km (7.7 miles) of Proposed Force Main/Sewer Lines in Boone and Kenton Counties, Kentucky*. Prepared for Cardinal Engineering Company. Prepared by University of Kentucky, 008-040.

This survey included 7,597 m (24,925 ft) of sewer line, 4,755m (15,600 ft) of force main, and 30.5 m (100 ft) of sewer treatment plant property. One archaeological site was located. This site was recommended to be not eligible for inclusion in the National Register of Historic Places (NRHP) and no further work was recommended at that time.

Henderson, Gwynn A.

1985 *Cultural Resource Assessment of Selected Areas Within and Adjacent to the Greater Cincinnati International Airport, Boone County, Kentucky*. Prepared for Greater Cincinnati International Airport. Prepared by University of Kentucky, 008-045.

This survey included selected areas totaling 100 acres within and adjacent to the Greater Cincinnati International Airport. Two archaeological sites were located. These sites were not considered eligible for the National Register of Historic Places (NRHP) and no further assessment of these resources was recommended.

Sussenbach, Tom

1986 *Cultural Resource Assessment of a Proposed New Runway at the Greater Cincinnati International Airport, Boone County, Kentucky*. Prepared for Greiner Engineering Sciences, Inc. Prepared by University of Kentucky, 008-048.

This survey included approximately 600 acres within and adjacent to the Greater Cincinnati International Airport. Fourteen archaeological sites were located and one previously located site was revisited. Six historical sites located during the survey were recommended potentially eligible for nomination to the National Register of Historic Places (NRHP). It was recommended that the

potential significance of these six sites be further evaluated. In addition to the sites previously mentioned, two non-site areas were located in the project area consisting of a historic cemetery and a historic bridge. It was recommended that the two graves in the cemetery be disinterred and reinterred elsewhere. The bridge was recommended for additional investigation.

Sussenbach, Tom

1986 *Cultural Resource Assessment of a 450 Acre Tract at the Greater Cincinnati International Airport, Boone County, Kentucky.* Prepared for Greater Cincinnati International Airport. Prepared by University of Kentucky, 008-052.

This survey consisted of approximately 450 acres at the Greater Cincinnati International Airport and has been proposed for additional airport facilities. Twenty-eight archaeological sites and two historic cemeteries were located. Eight sites were recommended as potentially eligible for nomination to the National Register of Historic Places (NRHP). It was recommended that the potential significance of these eight sites be further evaluated. Also recommended was the removal of the burials contained in the two cemeteries, and their reinterment elsewhere.

Schock, Jack M.

1987 *A Cultural Reconnaissance of Approximately 26 Acres for a Proposed Expansion of the Van Melle Project at Erlanger in Boone County, Kentucky.* Prepared for Northern Kentucky Area Development District. Prepared by Arrow Enterprises, 008-060.

This survey consisted of approximately 26 acres for a proposed expansion of the Van Melle project. No archaeological sites were located. No further archaeological work was recommended for this project.

Clifford, Laura

2000 *Phase I Cultural Resources Report for the Proposed Houston Commons Development in Florence, Boone County, Kentucky.* Prepared for North American Properties. Prepared by Environment and Archaeology, LLC, 008-091.

This survey consisted of approximately 32 acres for a proposed construction of a new commercial development, Houston Commons, on Houston Road in Florence, Boone County, Kentucky. Two previously located archaeological sites were reassessed. No new information was found at these sites and no further work was recommended for this project area.

Breetzke, David

2005 *Abbreviated Phase I Archaeology Report Gunpowder Creek Stormwater Treatment Facility Access Road Burlington, Boone County, Kentucky.* Prepared for Kenton County Airport Board. Prepared by Environment and Archaeology, LLC, 008-129.

This survey consisted of approximately 254,834 square ft (5.85 acres) for the proposed Gunpowder Creek Stormwater Treatment Facility Access Road. No archaeological sites were found and no

further work was recommended for this project area.

Kreinbrink, Jeannine

2005 *Hopeful Lutheran Church. Florence, Boone County, Kentucky Archaeology Project Final Report.* Prepared for Hopeful Lutheran Church. Prepared by Behringer-Crawford Museum, 008-132.

This survey consisted of students excavating 2 acres at the possible location of where the 1837 church stood before the current church was built in 1917. Historic artifacts as well as the possible back foundation wall of the old church was located. It was unlikely further excavations would yield important archaeological information and further work was not recommended for this project area.

Table 1. Previously Recorded Archaeology Sites Located Within a 2-Kilometer Radius of the Proposed Project Area.

Site #	Site Name	Topography	Type Of Site	Cultural Affiliation	Site Area	Distance to Water (m)	Elevation	Surveyed By, Affiliation, Date Recorded	NRHP Status
15Be306	N/A	Cultivated Field	Open Habitation w/o Mounds	Unassigned	1,800 square meters	Intermittent Stream 50m	870' amsl	T. Sussenbach, Univ. Of KY., 1986	Inventory Site
15Be305	N/A	Cultivated Field	Open Habitation w/o Mounds	Unassigned	2,400 square meters	Tributary of Gunpowder Creek 40m	860' amsl	T. Sussenbach, Univ. Of KY., 1986	Inventory Site
15Be304	N/A	Cultivated Field	Undetermined	Unassigned	2,500 square meters	Intermittent Stream 170m	900' amsl	T. Sussenbach, Univ. Of KY., 1986	Inventory Site
15Be303	N/A	Cultivated Field	Open Habitation w/o Mounds	Unassigned	11,900 square meters	Permanent Stream 100m	890' amsl	T. Sussenbach, Univ. Of KY., 1986	Inventory Site
15Be302	N/A	Cultivated Field	Undetermined	Unassigned	4,000 square meters	Intermittent Stream, 370m	920' amsl	T. Sussenbach, Univ. Of KY., 1986	Inventory Site
15Be301	Double Wells	Woods/Forest	Historic Farm/ Residence	Historic Non-Indian, 1851-1950	700 square meters	Intermittent Stream, 230m	880' amsl	T. Sussenbach, Univ. Of KY., 1986	Not assessed
15Be300	N/A	Cultivated Field	Undetermined	Unassigned	2,500 square meters	Tributary of Gunpowder Creek, 140m	900' amsl	T. Sussenbach, Univ. Of KY., 1986	Inventory Site
15Be311	N/A	Woods/Forest	Historic Farm/ Residence	Historic Non-Indian, 1851-1950	6,000 square meters	Well, 10m	890' amsl	T. Sussenbach, Univ. Of KY., 1986	Not assessed
15Be310	N/A	Scrub/Secondary Growth	Historic Farm/ Residence	Historic Non-Indian, 1851-1950	1,250 square meters	Lake/Pond, 30m	890' amsl	T. Sussenbach, Univ. Of KY., 1986	Not assessed
15Be321	N/A	Cultivated Field	Open Habitation w/o Mounds	Unassigned	100 square meters	Intermittent Stream, 80m	880' amsl	T. Sussenbach, Univ. Of KY., 1986	Inventory Site
15Be322	N/A	Cultivated Field	Undetermined	Unassigned	50 square meters	Intermittent Stream, 150m	880' amsl	T. Sussenbach, Univ. Of KY., 1986	Inventory Site
15Be323	N/A	Cultivated Field	Open Habitation w/o Mounds	Late Archaic	3,000 square meters	Intermittent Stream, 200m	900' amsl	T. Sussenbach, Univ. Of KY., 1986	Not assessed
15Be324	N/A	Cultivated Field	Open Habitation w/o Mounds	Middle Archaic	1,500 square meters	Intermittent Stream, 200m	880' amsl	T. Sussenbach, Univ. Of KY., 1986	Not assessed
15Be325	N/A	Cultivated Field	Open Habitation w/o Mounds	Early and Late Archaic, Late Woodland/ Mississippian	8,000 square meters	Intermittent Stream, 100m	880' amsl	T. Sussenbach, Univ. Of KY., 1986	Not assessed

Site #	Site Name	Topography	Type Of Site	Cultural Affiliation	Site Area	Distance to Water (m)	Elevation	Surveyed By, Affiliation, Date Recorded	NRHP Status
15Be326	N/A	Cultivated Field	Undetermined	Unassigned	200 square meters	Intermittent Stream, 100m	900' amsl	T. Sussenbach, Univ. Of KY., 1986	Inventory Site
15Be327	N/A	Cultivated Field	Historic Farm/Residence	Historic Non-Indian, 1801-1950	2,500 square meters	Permanent Stream, 80m	860' amsl	T. Sussenbach, Univ. Of KY., 1986	Not assessed
15Be328	N/A	Recreational	Historic Farm/Residence	Historic Non-Indian, 1851-1950	34.74 square meters	unnamed stream, 150' E	860' amsl	T. Sussenbach, Univ. Of KY., 1986	Not assessed
15Be329	N/A	Pasture	Historic Farm/Residence	Historic Non-Indian	2,000 square meters	Well, 10m	840' amsl	T. Sussenbach, Univ. Of KY., 1986	Not assessed
15Be330	N/A	Pasture	Historic Farm/Residence	Historic Non-Indian, 1851-1950	2,400 square meters	Well, 260m	850' amsl	T. Sussenbach, Univ. Of KY., 1986	Not assessed
15Be331	N/A	Pasture	Historic Farm/Residence	Historic Non-Indian, 1901-1950	900 square meters	Well, 10m	262 meters amsl	T. Sussenbach, Univ. Of KY., 1986	Not assessed
15Be332	N/A	Cultivated Field	Historic Farm/Residence	Historic Non-Indian, 1851-1950	1,000 square meters	Intermittent Stream, 150m	900' amsl	T. Sussenbach, Univ. Of KY., 1986	Not assessed
15Be334	N/A	Pasture	Historic Farm/Residence	Historic Non-Indian, 1901-1950	1,500 square meters	Well, 10m	890' amsl	T. Sussenbach, Univ. Of KY., 1986	Not assessed
15Be335	N/A	Cultivated Field	Open Habitation w/o Mounds	Unassigned	1,200 square meters	Tributary for Gunpowder Creek, 200m	850' amsl	T. Sussenbach, Univ. Of KY., 1986	Inventory Site
15Be336	N/A	Cultivated Field	Open Habitation w/o Mounds	Early Archaic	5,000 square meters	Intermittent Stream, 80m	870' amsl	T. Sussenbach, Univ. Of KY., 1986	Inventory Site
15Be337	N/A	Cultivated Field	Open Habitation w/o Mounds	Historic Non-Indian, 1851-1950	2,700 square meters	Permanent Stream, 180m	880' amsl	T. Sussenbach, Univ. Of KY., 1986	Inventory Site
15Be338	N/A	Cultivated Field	Open Habitation w/o Mounds	Unassigned	225 square meters	Intermittent Stream, 70m	875' amsl	T. Sussenbach, Univ. Of KY., 1986	Inventory Site
15Be339	N/A	Cultivated Field	Open Habitation w/o Mounds	Unassigned	4,000 square meters	Intermittent Stream, 100m	890' amsl	T. Sussenbach, Univ. Of KY., 1986	Inventory Site
15Be340	N/A	Cultivated Field	Undetermined	Unassigned	150 square meters	Intermittent Stream, 300m	880' amsl	T. Sussenbach, Univ. Of KY., 1986	Inventory Site

Site #	Site Name	Topography	Type Of Site	Cultural Affiliation	Site Area	Distance to Water (m)	Elevation	Surveyed By, Affiliation, Date Recorded	NRHP Status
15Be550	N/A	Pasture	Undetermined	Historic Non-Indian, 1951-2000, 1851-1950	5,600 square meters	Tributary of Gunpowder Creek, 100m	920' amsl	T. Sussenbach, Univ. Of KY., 1986	Inventory Site
15Be307	N/A	Cultivated Field and Pasture	Open Habitation w/o Mounds	Unassigned	2,800 square meters	Intermittent Stream, 180m	890' amsl	T. Sussenbach, Univ. Of KY., 1986	Inventory Site
15Be296	N/A	Pasture	Historic Farm/Residence	Historic Non-Indian, 1851-1950	14,500 square meters	Gunpowder Creek, 300m	910' amsl	A.G. Henderson, Univ. Of KY., 1985	Inventory Site
15Be298	N/A	Woods/Forest	Dump/Historic	Historic Non-Indian, 1851-1950	30 square meters	Intermittent Stream, 60m	880' amsl	T. Sussenbach, Univ. Of KY., 1986	Not assessed
15Be299	N/A	Woods/Forest	Dump/Historic	Historic Non-Indian, 1851-1950	20 square meters	Intermittent Stream, 180m	890' amsl	T. Sussenbach, Univ. Of KY., 1986	Not assessed
15Be279	N/A	Pasture	Undetermined	Unassigned	1,200 square meters	Tributary of Gunpowder Creek, 20m	810' amsl	M. Gray and W. Pape 1982	Not assessed
15Be280	N/A	Cultivated Field	Undetermined	Middle and Late Woodland	750 square meters	Tributary of Gunpowder Creek, 20m	825' amsl	M. Gray and W. Pape 1982	Not assessed
15Be281	N/A	Pasture	Undetermined	Unassigned	1,000 square meters	Tributary of Gunpowder Creek, 20m	825' amsl	M. Gray and W. Pape 1982	Not assessed
15Be282	N/A	Pasture	Undetermined	Unassigned	1,000 square meters	Tributary of Gunpowder Creek, 20m	835' amsl	M. Gray and W. Pape 1982	Not assessed
15Be263	N/A	Cultivated Field	Open Habitation w/o Mounds	Unassigned	1,000 square meters	Intermittent Stream, 260m	920' amsl	K.H. Fiegel, KYDOT 1981	Inventory Site
15Be283	N/A	Cultivated Field	Undetermined	Unassigned	750 square meters	Tributary of Gunpowder Creek, 20m	845' amsl	M. Gray and W. Pape 1982	Not assessed
15Be264	N/A	Pasture	Open Habitation w/o Mounds	Unassigned	1,000 square meters	Intermittent Stream, 120m	910' amsl	K.H. Fiegel KYDOT 1981	Inventory Site
15Be309	N/A	Road/Trail	Open Habitation w/o Mounds	Unassigned	2,400 square meters	Intermittent Stream, 130m	910' amsl	T. Sussenbach, Univ. Of KY., 1986	Inventory Site
15Be308	N/A	Cultivated Field	Open Habitation w/o Mounds	Unassigned	7,500 square meters	Intermittent Stream, 70m	890' amsl	T. Sussenbach, Univ. Of KY., 1986	Inventory Site
15Be313	N/A	Cultivated Field	Undetermined	Unassigned, Historic Non-Indian, 1901-1950	1,200 square meters	Intermittent Stream, 250m	870' amsl	T. Sussenbach, Univ. Of KY., 1986	Inventory Site

Site #	Site Name	Topography	Type Of Site	Cultural Affiliation	Site Area	Distance to Water (m)	Elevation	Surveyed By, Affiliation, Date Recorded	NRHP Status
15Be315	N/A	Cultivated Field	Open Habitation w/o Mounds	Middle Archaic	3,600 square meters	Tributary of Gunpowder Creek, 10m	810' amsl	T. Sussenbach, Univ. Of KY., 1986	Not assessed
15Be314	N/A	Cultivated Field	Undetermined	Unassigned	2,400 square meters	Intermittent Stream, 150m	900' amsl	T. Sussenbach, Univ. Of KY., 1986	Inventory Site
15Be316	N/A	Cultivated Field	Open Habitation w/o Mounds	Early Archaic	13,000 square meters	Intermittent Stream, 5m	820' amsl	T. Sussenbach, Univ. Of KY., 1986	Not assessed
15Be317	N/A	Cultivated Field	Open Habitation w/o Mounds	Unassigned	300 square meters	Intermittent Stream, 150m	895' amsl	T. Sussenbach, Univ. Of KY., 1986	Inventory Site
15Be318	N/A	Cultivated Field	Undetermined	Unassigned	300 square meters	Tributary of Gunpowder Creek, 100m	840' amsl	T. Sussenbach, Univ. Of KY., 1986	Inventory Site
15Be319	N/A	Cultivated Field	Open Habitation w/o Mounds	Unassigned	750 square meters	Intermittent Stream, 170m	850' amsl	T. Sussenbach, Univ. Of KY., 1986	Inventory Site
15Be320	N/A	Cultivated Field	Open Habitation w/o Mounds	Unassigned	1,500 square meters	Intermittent Stream, 50m	860' amsl	T. Sussenbach, Univ. Of KY., 1986	Not assessed
15Be284	Rayburn Site	Pasture	Undetermined	Unassigned	3,000 square meters	Intermittent Stream, 20m	867' amsl	M. Gray and W. Pape 1982	Not assessed
15Be557	Hopeful Lutheran Church	Religious	Undetermined	Unassigned	8,116 square meters	Tributary of Gunpowder Creek, 2000m	259' amsl	J. Kreinbrink, Behringer-Crawford Museum, 2004	Not assessed
15Be333	N/A	Cultivated Field	Historic Farm/Residence	Historic Non-Indian, 1851-1950	1,200 square meters	Well, 10m	850' amsl	T. Sussenbach, Univ. Of KY., 1986	Not assessed
15Be549	N/A	Pasture	Historic Farm/Residence	Historic Non-Indian, 1951-2000	4,900 square meters	Intermittent Stream, 30m	880' amsl	A. Bybee, CRA, Inc., 2006	Inventory Site
15Be551	N/A	Pasture	Undetermined	Unassigned	100 square meters	Intermittent Spring, 200m	N/A	T. Fugate, Gray and Pape, 2004	Inventory Site

SURVEY PREDICTIONS

Much prehistoric settlement data has been collected from locations in Kentucky similar to the current project area. Broadly defined categories of land use can be identified and used effectively as a general tool in preparing a survey prediction.

The identification of archaeologically sensitive areas can be applied to both prehistoric and historic sites. Special purpose sites, such as cemeteries, quarries, and areas with religious significance, are difficult to classify in a generalized predictive model. These sites depend on either the distribution of a particular natural resource (i.e., chert and clay) or intangible variables that may not be discernable.

Site Locational Influences: Prehistoric

Generally, the most important locational requirements of both prehistoric and historic habitation sites were proximity to water, slope angle, availability of natural resources, and well drained soil. Throughout time, many prehistoric groups in Pennsylvania favored living near the propitious fishing grounds of large streams. In addition, intensive Woodland period horticultural villages were commonly situated on wide, fertile bottomlands where crop raising was most productive. In areas where floodplains were too narrow or otherwise unsuitable for occupation, terraces and slope benches above the drainages were sometimes inhabited instead. Prehistoric sites also frequently clustered around stream confluences, further indicating a desire for living near waterways that provided ample resources and an adequately large infrastructure for travel, trade, and communication (Stewart 1980).

Large or long-term habitation sites, characterized by relatively dense depositions of artifacts and cultural debris, were seldom located on minor interior drainages. Ephemeral, low profile sites representing small, temporary or seasonal occupations and procurement stations, however, were often positioned on the banks of low rank streams; often these places served as ancillary or winter camps for groups who lived on larger streams nearby. Upland exploitative, portage and enroute encampments were often situated near the height-of-land between drainages. The height-of-land offered both immediate access to a variety of ecological zones and an easier route along the ridge backs than one which led a traveler across drainages. Caves and rockshelters also provided convenient locations for habitation as well. Small, fortified protohistoric sites and other prehistoric sites were often located in the uplands, especially near spring-headwater regions along ridgetops. Such areas were also selected by later historic occupants (Stewart 1980).

Locational prerequisites for special purpose sites (e.g. places where the dead were interred, spots of religious significance, game drops, chert quarries) may not have been as restricted as those for habitation sites. Cemeteries, as well as mounds and other earthworks, have been noted on floodplains, terraces, slope benches, and ridgetops. Petroglyphs and similar phenomena are sometimes found in caves and rockshelters, under rock overhangs, on rocky cliff faces, and even on large boulders. Sites where short-term subsistence activities were performed usually go undetected,

although many finds of isolated projectile points are probably correctly identified as the results of hunting incidents. Chert outcrops are not always well known, as chert currently has little marketable value. Areas of high archaeological sensitivity are those with well drained soils, slopes less than eight percent, located within 250 meters of a constant water source, especially along the larger streams and rivers (Stewart 1980).

Site Locational Influences: Historic

Initially, aboriginal trails interconnected prehistoric settlements and areas where natural resources were exploited. Early Euro-American pioneers followed these small trails to habitable locales and later converted many of them to wagon roads and highways. As a result, some continuity of settlement pattern does exist from prehistoric into historic times. At first, Euro-American settlers occupied only the valleys of major rivers and their larger tributaries, but soon they spread inland. Mills were built along nearly every sufficiently powerful stream, and the establishment of ancillary shops and services followed shortly. Roads were constructed to provide access to mills, and population clusters soon developed at major crossroads in the highway network.

After roads were established, people situated their houses and farms further from large drainages and closer to watersheds, or heights-of-land. Extractive sites, such as quarries, coal mines, and logging camps were naturally located near their target resources. Manufacturing sites such as potteries, iron smelting furnaces, lime kilns, coke ovens, and brickyard were usually positioned near source of raw material as well as an abundant water supply. Areas of high archaeological sensitivity are those with well drained soils, slopes less than eight percent and located with 250 meters of a constant water source, or with slopes less than five percent within 100 meters of historic roads.

Project Expectations

Based on the data available from the Literature Review, certain predictions were possible regarding the kinds of sites thought likely to be encountered in the survey area. Since the proposed project area is located near Gunpowder Creek and there were a high number of previously recorded prehistoric and historic sites located within a 2-kilometer radius, the proposed project area was considered to have a high potential for producing both prehistoric and historic archaeological resources.

FIELD METHODOLOGY AND RESULTS

The methods employed for this Phase I survey included shovel testing and surface inspection based on requirements outlined in the *Specifications for Conducting Fieldwork and Preparing Cultural Resource Assessment Reports* produced by the Kentucky State Historic Preservation Office and the Kentucky Heritage Council (KHC) (2006).

In general, areas containing slope are subjected to a visual survey for structures, rock outcrops, and rock shelters. No shovel testing is conducted in these areas. In areas where slope is less than 15 percent and surface visibility is greater than 75 percent, systematic surface reconnaissance is conducted. In areas containing less than 75 percent surface visibility, shovel tests measuring 30 centimeters (0.98 feet) are excavated in natural levels. Shovel tests would be conducted at 50-foot (15-meter) intervals in areas where disturbance was not evident at the surface. In areas of visible surface disturbance, systematic surface survey is conducted. In some of these disturbed areas, shovel testing was conducted in order to confirm the disturbance. If prehistoric or historic artifacts were recovered during shovel testing, intra-site testing in a cruciform pattern was conducted. This process includes the excavation of additional shovel test pits at 7.5-meter intervals in the four cardinal directions. This process continued until two consecutively negative shovel test pits were excavated or the boundaries of the project area were reached.

Shovel tests measured 0.30 meters (0.98 feet) in diameter, in accordance with KHC (2006) guidelines, and were excavated into culturally sterile subsoil deposits. All soils were screened through ¼-inch mesh hardware cloth, and the artifacts were retained for analysis. A record of soil stratigraphy was made using Munsell soil color charts and United States Department of Agriculture (USDA) soil classifications. In the field, strata encountered in shovel tests were given a letter designation in alphabetical sequence (e.g., Stratum A, Stratum B, Stratum C, etc.). Such letter designations do not correspond to pedogenic soil horizons; rather, they refer to the order in which the strata were excavated. When present, natural soils are referred to by their pedogenic nomenclature (A_p-horizon, B-horizon, etc.). The location of all shovel tests were recorded on field maps. The project area consisted of two separate parcels (11 and 44 acres) and as such, the results will be discussed separately for each parcel.

11-acre

The 11-acre survey area was located northeast of the 55-acre survey area (Figure 2 and Photos 1-4). The entire 11-acre project area was systematically shovel tested, excavating a total of 194 sample loci (Figure 3):

- 186 sample loci excavated, no cultural resources recovered,
- 4 sample loci were located in a small artificial creek/drainage and were not excavated,
- 3 sample loci were located on a side slop of the artificial drainage and were not excavated,
- 1 sample loci was excavated, and an Isolated Historic Find was recorded.

Soil profiles in the 1-acre survey area varied, with the most common profiles listed in Table 2.



Photo 1. ZF Lenksysteme Expansion Project Area Facing West.



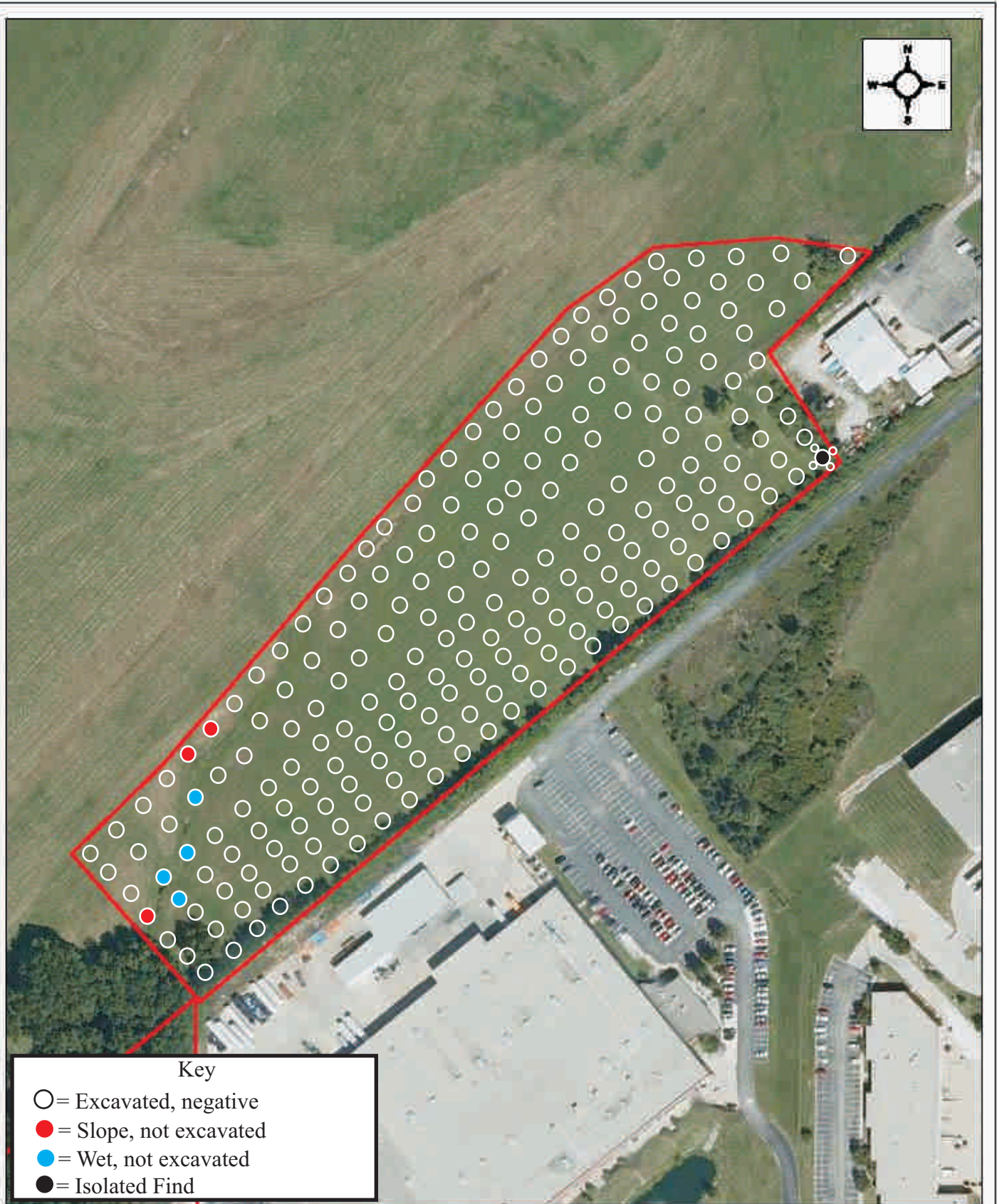
Photo 2. ZF Lenksysteme Expansion Project Area Facing North.



Photo 3. ZF Lenksysteme Expansion Project Area Representative Shovel Test Profile.



Photo 4. ZF Lenksysteme Expansion Project Area Facing South.



Key

- = Excavated, negative
- = Slope, not excavated
- = Wet, not excavated
- = Isolated Find

Figure 3

Kenton County Airport Board
 Cincinnati/Northern Kentucky International Airport
 Expansion of ZF Lenksysteme Campus and Separate
 Commercial Development Project Shovel Test Map
 Boone County, Kentucky

Aerial Map
 provided by ESRI Map Services
 1:2,400
 Environment & Archaeology, LLC

Table 2. Common Soil Profiles Identified within the Proposed 11-acre Survey Area.

Soil Profile	Depth (cmbs)	Soil Type
A	0-23cmbs 23-35cmbs	10 YR 4/3 silty loam 10 YR 6/6 silty clay loam
B	0-30cmbs 30-42cmbs	10 YR 4/3 silty loam 10 YR 5/6 silty clay loam
C	0-28cmbs 28-38cmbs	10 YR 4/4 clay loam 10 YR 6/6 silty clay loam
D	0-24cmbs 24-35cmbs	10 YR 4/4 clay loam 10 YR 5/4 silty clay loam
E	0-29cmbs 29-47cmbs	10 YR 3/6 silty loam 10 YR 5/8 clay loam
F	0-12cmbs 12-30cmbs	10 YR 4/3 silty loam 10 YR 5/8 compact silty loam

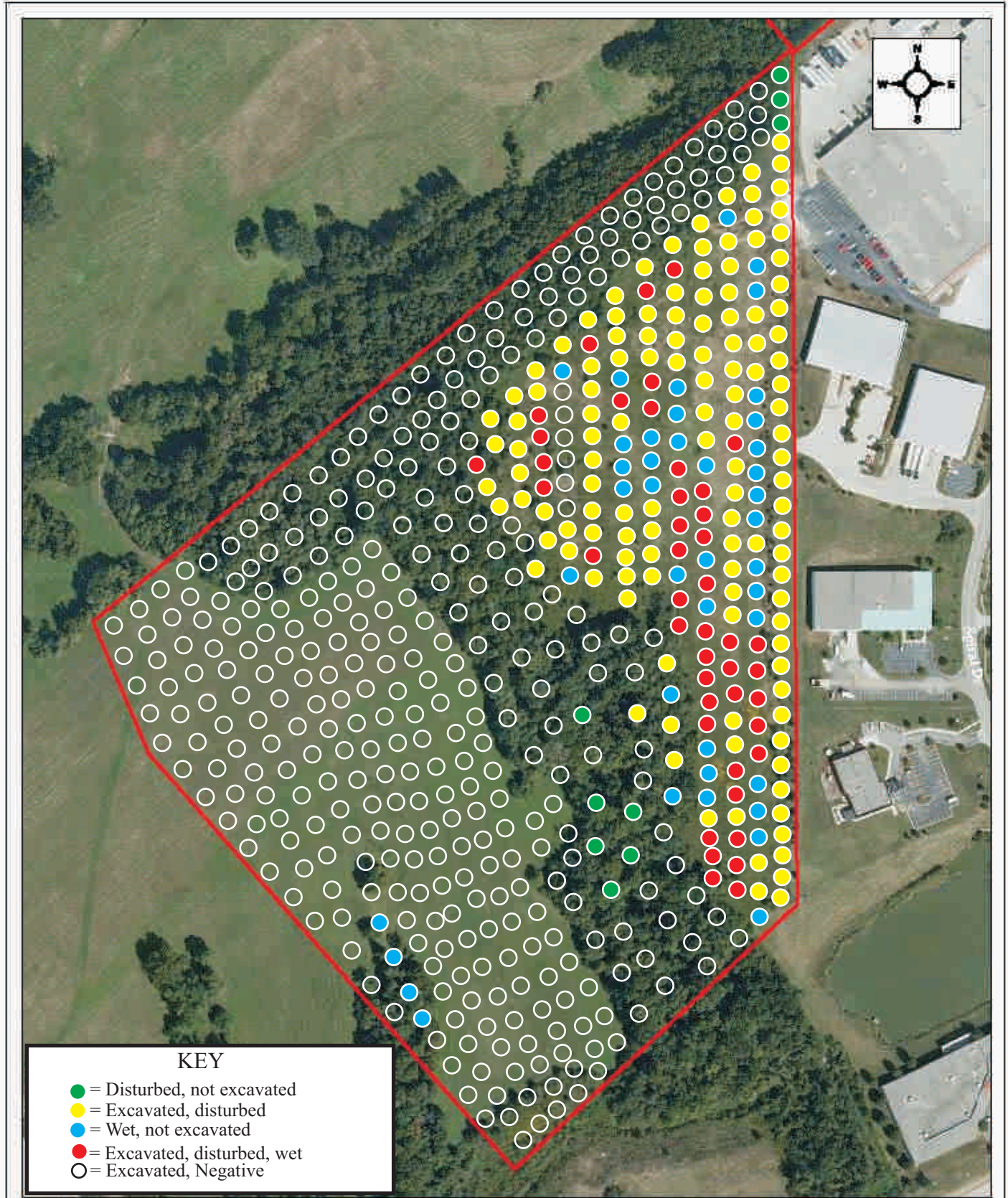
The Isolated Find was located in the northeast corner of the 11-acre survey area and consisted of two pieces of flat glass located just below the root mass cap. All radial shovel test excavated were negative. Nancy O'Malley with the Office of State Archaeology was consulted with in regards to the status of this find and whether or not a site number was deemed necessary, which it was not.

44-acre

The 44-acre survey area was located southwest of the 11-acre survey area (Figure 2). The entire 44-acre survey area was systematically shovel tested, excavating a total of 599 sample loci (Figure 4):

- 322 sample loci excavated, no cultural resources recovered,
- 125 sample loci excavated, disturbed soils encountered,
- 56 sample loci excavated, disturbed and wet soils encountered,
- 36 sample loci were located within standing water, no sample loci excavated,
- 13 sample loci were located in actively disturbed areas, no sample loci excavated,
- 7 sample loci were located in areas of excessive slope, no sample loci excavated.

Soil profiles in the 44-acre survey area varied, with the most common profiles listed in Table 3. No cultural resources were recovered from the sample loci excavated within the 44-acre survey area.



KEY

- = Disturbed, not excavated
- = Excavated, disturbed
- = Wet, not excavated
- = Excavated, disturbed, wet
- = Excavated, Negative

Figure 4	<p>Kenton County Airport Board Cincinnati/Northern Kentucky International Airport ZF Lenksysteme Expansion Project Shovel Test Map Boone County, Kentucky</p>	<p>Aerial Map provided by ESRI Map Services 1:3,300 <i>Environment & Archaeology, LLC</i></p>
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Table 3. Common Soil Profiles Identified within the Proposed 44-acre Survey Area.

Soil Profile	Depth (cmbs)	Soil Type
A	0-21 cmbs 21-31 cmbs	10YR 4/4 silty loam 10 YR 5/6 silty loam
B	0-35 cmbs 35-40 cmbs	10 YR 4/3 silty loam 10 YR 5/6 silty clay loam
C	0-23 cmbs 23-33 cmbs	10 YR 4/2 silty loam 10 YR 4/4 silty loam
D	0-30 cmbs 30-40 cmbs	10 YR 5/2 silty loam 10YR 6/6 silty clay loam
E	0-16 cmbs 16-30 cmbs	10 YR 4/2 silty loam 10YR 5/6 silty clay loam

SUMMARY AND RECOMMENDATIONS

The Phase I Archaeology Survey for the proposed Kenton County Airport Board's Expansion of ZF Lenksysteme Campus and Separate Commercial Development Project took place in July 2010. The proposed project consisted of two separate parcels totaling 55-acres in survey size. Both survey areas were located within areas of thick woods and open fallow agricultural fields. The entirety of the proposed project areas were systematically shovel tested.

A single historic Isolated Artifact Find was identified during the course of the field survey. All radial shovel tests excavated produced negative results. No historic structures were visible within the project area or within the project area's viewshed. Based upon the singular nature of the Isolated Find and the lack of any supporting cultural context, this Isolated Find does not appear to have the potential to contribute to our understanding of either the history or prehistory of the area. Therefore it is unlikely that further archaeological studies would result in the collection of meaningful data relating to the history or prehistory of the project area. It is the recommendation of *Environment & Archaeology, LLC* that no additional historical or archaeological survey work is needed for this project area and further consultation under Section 106 of the National Historic Preservation Act is not necessary.

REFERENCES CITED

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Broida, Mary O.

1983 *A Cultural Resource Assessment of 12.4 km (7.7 miles) of Proposed Force Main/Sewer Lines in Boone and Kenton Counties, Kentucky*. Prepared for Cardinal Engineerin Company. Prepared by University of Kentucky.

Gray, Marlesa A.

1982 *Cultural Resources Reconnaissance of the Dilcrest and Hopeful Heights Sewer Line Corridors, Boone County, Kentucky*. Prepared for Cardinal Engineering Company. Prepared by Northern Kentucky University.

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Kreinbrink, Jeannine

2005 *Hopeful Lutheran Church. Florence, Boone County, Kentucky Archaeology Project Final Report*. Prepared for Hopeful Lutheran Church. Prepared by Behringer-Crawford Mureum.

Schock, Jack M.

1987 *A Cultural Reconnaissance of Approximately 26 Acres for a Proposed Expansion of the Van Melle Project at Erlanger in Boone County, Kentucky*. Prepared for Northern Kentucky Area Development District. Prepared by Arrow Enterprises.

Stewart, R. Michael

1980 *Prehistoric Settlement and Subsistence Patterns and the Testing of Predictive Site Location Models in the Great Valley of Maryland*. PhD. Dissertation, Department of Anthropology. The Catholic University of America, Washington, D.C.

Sussenbach, Tom

1986 *Cultural Resource Assessment of a 450 Acre Tract at the Greater Cincinnati International Airport, Boone County, Kentucky*. Prepared for Greater Cincinnati International Airport. Prepared by the University Of Kentucky.

Sussenbach, Tom

1986 *Cultural Resources Assessment of a Proposed New Runway at the Greater Cincinnati Airport*. Prepared for Greiner Engineering Sciences, Inc. Prepared by Program for Cultural Resource Assessment.

Thiel, Barbara

1981 *An Archaeological Survey of the Proposed Florence Sewage Treatment Plant Area*. Prepared for Cardinal Engineering Company. Prepared by Northern Kentucky University.

Appendix A
Curriculum Vita

Luke W. Erickson
Principal Investigator

EDUCATION

- M.A., Anthropology, Archaeology, Eastern New Mexico University, Portales, NM, May 2002
- B.A., Anthropology, Northern Illinois University, DeKalb, IL, May 1997

PROFESSIONAL EXPERIENCE

Responsible for the implementation and execution of archaeological research projects involving historic and prehistoric resources. Plans and conducts surveys and excavations of historic and prehistoric sites. Preparation of technical reports in the Southeast, Northeast, Midwest, and mid-Atlantic United States. Mr. Erickson's major projects include:

Phase I Surveys

2009

Ohio **Addendum to the Phase I Cultural Resources Survey, East Ohio Gas (EOG), Pipeline Infrastructure Replacement, PIR 042 RM277, Project, Bethel, Franklin and Wayne Townships, Monroe County, Ohio.** For Dominion.

Phase I Cultural Resources Survey, East Ohio Gas (EOG), Pipeline Infrastructure Replacement, PIR 042 RM277, Project, Bethel, Franklin and Wayne Townships, Monroe County, Ohio. For Dominion.

Phase I Cultural Resources Report for the Parky's Farm Improvements, West Fork Lake Project, Springfield Township, Hamilton County, Ohio. For the Hamilton County Park District

Pennsylvania **Phase I Cultural Resources Assessment Report for the National Fuel Gas Supply Corporation West to East – Overbeck to Leidy Project, Elk, Jefferson, Clearfield, Cameron and Clinton Counties, Pennsylvania.** For Match Mott MacDonald.

Kentucky **Phase I Survey for the Leesburg Cell Tower, Georgetown, Scott County, Kentucky.** For Terracon.

Phase I Survey for the Cassady Cellular Tower, Bowling Green, Warren County, Kentucky. For Terracon.

Phase I Survey for the Buena Vista Cell Tower, Vanceburg, Lewis County, Kentucky. For Verizon Wireless.

Phase I Survey for the Waterford Cell Tower, Taylorsville, Spencer County, Kentucky. For Terracon.

Phase I Survey for the Reed 2 Cellular Tower, In Owensboro, Daviess County, Kentucky. For T-Mobile South, LLC.

Phase I Survey of a Proposed Access Road for the Short Creek Cellular Tower, in Caneyville, Grayson County, Kentucky. For Powertel/Memphis, Inc.

Phase I Survey of the McAlpin Avenue/Dixie Highway (U.S. 25) Intersection Realignment, Kenton County, KY. For the City of Erlanger, Kenton County, KY.

New York **Abbreviated Phase 1A/1B Cultural Resources Survey for the Timothy Whitcomb, EQIP NRCS Agrichemical Handling Facility Project, Wayne County, New York**

Abbreviated Phase 1A/1B Cultural Resources Survey for the Youngman Brothers EQIP NRCS Agrichemical Handling Facility Project, Wayne County, New York

West Virginia **Disturbance Letter for the H-19266 2” Pipeline Relocation Project, McDowell County, West Virginia.** For Dominion Transmission, Inc.

Abbreviated Phase I Cultural Resources Report for the 2009 Coronado #16B Interconnect Project, Barbour County, West Virginia. For Dominion Transmission, Inc.

Representative Phase I Surveys

2002 to 2006 Over 200 Phase I Surveys conducted for the Georgia Department of Transportation, Atlanta
2002 to 2006 Hundreds of Borrow Pit Surveys conducted for the Georgia Department of Transportation, Atlanta

Representative Phase II Surveys

2002 to 2006 Participated in 10 Phase II Surveys for the Georgia Department of Transportation, Atlanta
2002 to 2006 Review of dozens of Phase II and Phase III reports prepared by consultants for the Georgia department of Transportation, Atlanta

Phase III Surveys

Phase III Data Recovery at Site 11PK1702 for the Rockies Express Pipeline East (REX-East) Project, Pike County, Illinois. For Caprock Environmental Services, LLC.

Andrea D. Crider
Principal Investigator

EDUCATION

- \$ M.A., Anthropology, Archaeology, Northern Arizona University, Flagstaff, May 2001.
- \$ B.S.W, Social Work, University of Cincinnati, Cincinnati, Ohio, June 1996.

PROFESSIONAL EXPERIENCE

Responsible for the implementation and execution of archaeological research projects involving historic and prehistoric resources. Plans and conducts surveys and excavations of historic and prehistoric sites. Preparation of technical reports in the southeast, northeast, midwest, and mid-Atlantic United States. Ms. Crider's major projects include:

Phase II and III Excavations

- 2008 **Phase III Data Recovery of Site 11Pk1702 For the Rockies Express Pipeline- East (Rex-East) Project in Pike County, Illinois.** For Caprock Environmental Services, LLC.
- 2008 **Phase III Data Recovery of Site 11Pk1599 For the Rockies Express Pipeline- East (Rex-East) Project in Pike County, Illinois.** For Caprock Environmental Services, LLC.
- 2008 **Phase III Data Recovery of Site 46Bo419 for the TL-263 Expansion Project in Boone County, West Virginia.** For Dominion Transmission, Inc.
- 2006 **Archaeological Testing (Phase II) of Site 12B1337, Project STP-3403(002) in Bartholomew County, Indiana.** For Indiana Department of Transportation.
- 2005 **Archaeological Phase II Assessment of Site 12Da1354, 12Da1378, and 12Da1380 for the Corning Mine Permit Area (S00308) in Daviess County, Indiana.** For Black Beauty Coal Mine.
- 2005 **Archaeological Testing (Phase II) for Site 12-AI-120 in Allen County, Indiana.** For Allen County Parks and Recreation.
- 2004 **Archaeological Phase II Assessment of Site 12Vi888 on SR 42 and Swalls Road, Vigo County, Indiana.** For DLZ Indiana, LLC.
- 2004 **Archaeological Testing (Phase II) on Site 12Sh337 for the Reconstruction of SR 244 in Shelby County, Indiana.** For Butler, Fairman, and Seufert.
- 2003 **A Phase II National Register Evaluation of 15CI174 within the Verizon Wireless Ghent Telecommunication Tower in Carroll County, Kentucky.** For Verizon Wireless.

Subsurface Reconnaissance/Deep Testing

- 2006 **Archaeological Subsurface Reconnaissance (Phase Ic) for Shelby County Bridge #13 in Shelby County, Indiana.** For Butler, Fairman, and Seufert.

- 2006 **Archaeological Subsurface Reconnaissance for County Bridge #146 in Putnam County, Indiana.** For Woolpert, LLP.
- 2005 **Archaeological Subsurface Reconnaissance (Phase Ic) for the Scipio Covered Bridge Bypass in Jennings County, Indiana.** For FPBH, Inc.
- 2005 **Archaeological Subsurface Reconnaissance (Phase Ic) for the Sparksville Road Borrow Pit #1 in Jackson County, Indiana.** For R. H. Marlin, Inc.
- 2004 **Archaeological Subsurface Reconnaissance (Phase Ic) for Improvements to US 231 in Martin County, Indiana.** Indiana Department of Transportation

Representative Phase I Surveys

- 2007 **Phase I Cultural Resource Survey for the HFC Well and Pipeline Multi-year Project in the Daniel Boone National Forest, Leslie County, Kentucky.** For Chesapeake Appalachia, LLC.
- 2007 **Phase I Cultural Resource Survey for the Junction Natural Gas Storage Project in Fayette County, Pennsylvania and Monongalia and Preston Counties, West Virginia.** For AK Environmental LLC.
- 2007 **Over 35 Cell tower Surveys in Kentucky, West Virginia, New York, Indiana, and Ohio.** For EBI Consultants, Environmental Corporation of America, Terracon, and Terradon.
- 2007 **Phase I Cultural Resource Survey for the Webster Springs Water Line Extension in Webster County, West Virginia.** For Potesta and Associates.
- 2007 **Phase IA/B Cultural Resource Survey for the Thompson WASCOS/EQIP Project in Livingston County, New York.** For Natural Resource Conservation Service Syracuse, New York.
- 2007 **Phase IA/B Cultural Resource Survey for the Beaver 2 AMA Project in Cattaraugus County, New York.** For Natural Resource Conservation Service Syracuse, New York.
- 2007 **Phase IA/B Cultural Resource Survey for the Maxwell EQIP Project in Livingston County, New York.** For Natural Resource Conservation Service Syracuse, New York.
- 2007 **Phase IA/B Cultural Resource Survey for the Cornell EQIP Project in Steuben County, New York.** For Natural Resource Conservation Service Syracuse, New York.
- 2007 **Phase I Cultural Resource Survey for the Cottonmouth Lodge Wetland Restoration Project in Muhlenberg County, Kentucky.** For Natural Resource Conservation Service Lexington, Kentucky.
- 2007 **Phase I Cultural Resource Survey for the Billy Ray Wetland Restoration Project in Muhlenberg County, Kentucky.** For Natural Resource Conservation Service Lexington, Kentucky.
- 2007 **Phase I Cultural Resource Survey for the Royster Farm Wetland Restoration Project in Muhlenberg County, Kentucky.** For Natural Resource Conservation Service Lexington, Kentucky.
- 2007 **Archaeological Field Reconnaissance for the Buckskin Mine (S-335), in Gibson County, Indiana.** For Peabody Energy Midwest

- 2007 **Archaeological Field Reconnaissance for a 40 Acre Tract , Farmersburg Mine West (S-287-3) in Vigo County, Indiana.** For Peabody Energy Midwest
- 2007 **Archaeological Field Reconnaissance for 1,393 Acre Knox Pit East Amendment, Miller Creek Mine in Knox County, Indiana.** For Peabody Energy Midwest
- 2006 **Archaeological Field Reconnaissance Francisco Coal Mine Expansion Area (S-301), Gibson County, Indiana.** For Peabody Energy Midwest
- 2006 **Archaeological Field Reconnaissance for 1,032 Acre Glen Ayr Coal Facility in Knox County, Indiana.** For Peabody Energy Midwest
- 2006 **Archaeological Field Reconnaissance for the Somerville Mine (S-322) in Gibson County, Indiana.** For Peabody Energy Midwest.
- 2006 **Archaeological Field Reconnaissance for a Wildcate Creek Land Purchase, Carroll County, Indiana.** For Wildcat Creek Foundation.
- 2006 **Archaeological Investigation of Site 12Hu1236 at the Lafontaine Golf Course in Huntington County, Indiana.** For Allen County-Fort Wayne Historical Society.
- 2006 **Archaeological Field Reconnaissance at the Miller Creek Mine, Jenlin Pit (Permit S-00348) in Clay County.** For Peabody Energy Midwest
- 2006 **Archaeological Field Reconnaissance for the Francisco Mine in Gibson County, Indiana.** For Peabody Energy Midwest
- 2006 **Archaeological Field Reconnaissance for the Enterprise Drive Extension, Des. Nos. 0200599, 0501012, 0501013, 0501014, 0501015, Madison County, Indiana.** For Beam, Longest, and Neff, LLC
- 2005 **Archaeological Field Reconnaissance for the White River Greenway near Heron Overlook in Delaware County, Indiana.** For DLZ Indiana, LLC
- 2005 **Archaeological Field Reconnaissance for the Miller Creek Mine, Knox Pit, in Knox County, Indiana.** For Black Beauty Coal Mine.
- 2005 **Archaeological Field Reconnaissance for the Salem Municipal Airport Expansion in Washington County, Indiana.** For R. W. Armstrong
- 2005 **Archaeological Field Reconnaissance INDOT Project NH-075-3(), Des. No. 846160, 936136D, Re-evaluation of Site 12-Sp-1005, Spencer County, Indiana.** For Indiana Department of Transportation.
- 2005 **Archaeological Field Reconnaissance INDOT Project NH-075-3(), Des. No. 846160, 936136D, Wetland Construction, Spencer County, Indiana.** For Indiana Department of Transportation.

- 2005 **Archaeological Field Reconnaissance for a Columbus Commercial Development in Bartholomew County, Indiana.** For Patriot Engineering.
- 2005 **Archaeological Field Reconnaissance: Re-Investigation of Site 12Sp972, 973, and 975 and a Phase Ib Survey of Site 12Sp1014/Du637 for the US 231 and I-64 Interchange. Project NH-075-3, Des. Nos.8461360, 9161365, 926136A, 926136B, 926136C, and 926136D, Spencer and Dubois Counties, Indiana.** For Indiana Department of Transportation.
- 2005 **Archaeological Field Reconnaissance for the Salem Municipal Airport, Washington County, Indiana. Indiana.** For R. W. Armstrong.
- 2004 **Archaeological Field Reconnaissance for the Meyer Tract of the Miller Creek Mine, Sugar Ridge Pit in Clay County, Indiana.** For Black Beauty Coal Mine.
- 2004 **Archaeological Field Reconnaissance for the Mattox Tract of the Miller Creek Mine, Jenlin Pit in Clay County, Indiana.** For Black Beauty Coal Mine.
- 2004 **Archaeological Field Reconnaissance for the Wellman Tract, Miller Creek Mine, Jenlin Pit (S-00348) in Clay County, Indiana.** For Black Beauty Coal Mine.
- 2003 **Archaeological Baseline Study for the Proposed Woodbine Connector Road in Whitley and Knox Counties, Kentucky (Item 11-112.00).** For Kentucky Transportation Cabinet.
- 2003 **Archaeological Baseline Survey of the Proposed Reconstruction of KY 1830 (Jintown Road) in Graves County, Kentucky (Item 1-8001.00).** For Kentucky Transportation Cabinet
- 2003 **Archaeological Baseline Survey of the Reconstruction of KY 536 (Mt. Zion Road) from Near the Boone/Kenton County Line to KY 17 in Kenton County Kentucky (6-162.00).** For Kentucky Transportation Cabinet.
- 2003 **Archaeological Survey of the US 421 (Leestown Road) Reconstruction in Fayette County (Item No. 7-223.00).** For Kentucky Transportation Cabinet
- 2002 **Archaeological Survey of the Towne Mall Bypass (Item No. 4-8003.00) in Hardin County Kentucky.** For Kentucky Transportation Cabinet
- 2002 **An Archaeological Baseline Study of the KY 3005 Extension in Hardin County, Kentucky (Item No.4-7010.00).** For Kentucky Transportation Cabinet



COMMERCE CABINET
KENTUCKY HERITAGE COUNCIL

Ernie Fletcher
Governor

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George Ward
Secretary

May 16, 2007

Mr. David M. Waldner, Director
Division of Environmental Analysis
Kentucky Transportation Cabinet
200 Mero Street, 5th Floor
Frankfort, KY 40622

Re: A Cultural Historic Survey for the Proposed South Airfield Road at the Cincinnati/Northern
Kentucky International Airport, Boone County, Kentucky (Item No. 6-193.00)

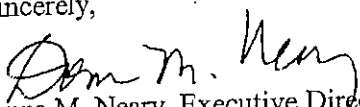
Dear Mr. Waldner:

The State Historic Preservation Office received for review and approval on April 23, 2007, the above-referenced report completed by Jacqueline P. Horlbeck of Cultural Resource Analysts, Inc. The proposed undertaking involves the construction of a new South Airfield Road within the southern limits of the Cincinnati/Northern Kentucky International Airport property. There are three alternatives located within the project area, which extends from KY 18 to Turfway Road (KY 1017).

The author identified five historic resources within the Area of Potential Effect (APE). We concur with the author that Site 2 (BE-1488), Site 3 (BE-1489), Site 4 (BE-555) and Site 5 (BE-1490) are not eligible for listing on the National Register of Historic Places (NRHP) individually or within the context of a historic district. We also agree with the author's evaluation of Site 1 (BE-176), J's Acres Farm, as being eligible for NRHP listing under Criterion A. This site is an outstanding example of an intact farmstead associated with dairy farming in the mid-twentieth century in Boone County. The project as proposed will not, it appears, have a direct effect on Site 1, nor will the proposed road construction be visible from this site.

Therefore, it is the determination of this office that this undertaking will have **No Effect** on the above-mentioned historic resources. If you have questions regarding these comments, please contact Janie-Rice Brother of my staff at (502) 564-7005, extension 121.

Sincerely,


Donna M. Neary, Executive Director
Kentucky Heritage Council and
State Historic Preservation Officer

Cc: Rebecca Turner (KYTC-DEA)



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June 12, 2007

Mr. David M. Waldner
Division of Environmental Analysis
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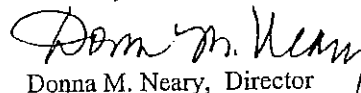
Re: *An Archaeological Survey of the Proposed South Airfield, Boone County, Kentucky* (Item No. 6-193.00) by Alexandra Bybee

Dear Mr. Waldner:

The State Historic Preservation Office has reviewed the above referenced revised archaeological report with the KYTC. The survey reinvestigated two previously recorded sites, 15Be549 and 15Be550, and identified two isolated finds. Sites 15Be549 and 15Be550 are low density scatters of architectural, domestic and other materials dating from the nineteenth through the mid-twentieth centuries. The low densities of historic materials and the eroded nature of the deposits indicate little archaeological integrity. The author recommends no further work for the sites as they are not considered eligible for listing in the National Register of Historic Places. The isolated finds are not eligible for listing in the National Register of Historic Places and no further work is recommended. I concur with the author's recommendations. Archival resources indicated that the Barlow Cemetery could be located within the proposed right-of-way of alternative three but no evidence of the cemetery was located during fieldwork. Should alternative three be chosen, and evidence of burials is discovered, all work should cease and this office should be contacted, as well as the local coroner and local law enforcement agencies as described in KRS §72.020. If burials are located, procedures should be implemented for having the cemetery declared abandoned and removed. If such should occur, we recommend that the removable be done by a professional archaeologist.

Should you have any questions, feel free to contact Lori Stahlgren of my staff at (502) 564-7005, extension 118.

Sincerely,


Donna M. Neary, Director
Kentucky Heritage Council and
State Historic Preservation Officer

cc: George Crothers
Alex Bybee

Appendix E

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APPENDIX E

TRAFFIC IMPACT STUDY

This Appendix includes a copy of the Traffic Impact Study prepared for this project.

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Where Creativity
Meets Functionality

Civil Engineers | Transportation Engineers | Landscape Architects | Planners | Land Surveyors

October 12, 2016

Mr. Matt Bogen, P.E.
Kentucky Transportation Cabinet, District 6
421 Buttermilk Pike
Covington, KY 41017

Re: Traffic Evaluation Update for Bosch Automotive Steering Facility Proposed Expansion & CVG Sites 6A-1, 6CE-1, & 6BW, City of Florence, Boone County, Kentucky

Dear Mr. Bogen,

Bayer Becker has prepared the following Traffic Evaluation Update for the following sites located in the City of Florence, Boone County, Kentucky:

- Proposed expansion of the Bosch Automotive Steering facility located on the south side of Aero Parkway east of Ted Bushelman Boulevard.
- CVG Site 6A-1, the VanTrust site, located on the west side of Ted Bushelman Boulevard south of Aero Parkway.
- CVG Site 6CE-1 located at the southeast corner of Aero Parkway and Ted Bushelman Boulevard.
- CVG Site 6BW, the Brandicorp site, located at the northwest corner of Doering Drive and Ted Bushelman Boulevard.

As indicated above, all four sites are located along Ted Bushelman Boulevard between Aero Parkway and Houston Road.

Proposed Development

The proposed expansion of the Bosch Steering facility will consist of 180,000 square feet of additional manufacturing space and will include the construction of a full movement access on Aero Parkway approximately 600 feet east of Ted Bushelman Boulevard, Proposed Access #1.

A proposed cul-de-sac street on Ted Bushelman Boulevard, Proposed Access #3, located approximately 1,210 feet south of Aero Parkway, is to be constructed by others.

CVG Site 6A-1 is to consist of 511,500 square feet of industrial/distribution space. Access to the site is proposed at two locations along Ted Bushelman Boulevard including Proposed Access #3 at approximately 1,210 feet south of Aero Parkway, opposite the proposed cul-de-sac associated with the Bosch expansion, and Proposed Access #4 at approximately 865 feet south of Proposed Access #3.

CVG Site 6CE-1 will consist of 18,000 square feet of retail space. Some possible retail uses include a specialty retail center (10,500 square feet), a fast-food restaurant with drive-through window (3,200 square feet), and a gasoline/service station with convenience market (4,300 square feet). Plans also include providing a connection to the proposed full movement access serving the Bosch expansion on Aero Parkway east of Ted Bushelman Boulevard, Proposed Access #1, as well as a direct access to Ted Bushelman Boulevard at approximately 685 feet south of Aero Parkway, Proposed Access #2.

6900 Tylersville Road, Suite A
Mason, OH 45040
513-336-6600

110 South College Ave., Ste. 101
Oxford, OH 45056
513-523-4270

1404 Race Street, Suite 204
Cincinnati, OH 45202
513-336-6600

209 Grandview Drive
Fort Mitchell, KY 41017
859-261-1113

CVG Site 6BW is to consist of 98,500 square feet of retail space including a department store (43,500 square feet) and an arts and crafts store (55,000 square feet). Access to the site is proposed at two locations including a full movement access on Doering Drive approximately 525 feet west of Ted Bushelman Boulevard, Proposed Access #6, and a proposed right-in/right-out only driveway, Proposed Access #5, located along Ted Bushelman Boulevard at approximately 400 feet south of Proposed Access #4 and approximately 325 feet north of Doering Drive.

Concept plans are attached for reference, Attachment A.

It is anticipated that each of the proposed developments will be opening sometime during the 2017 calendar year and that the proposed cul-de-sac street on Ted Bushelman Boulevard, Proposed Access #3, is to be constructed by others (the City of Florence) also in 2017.

Area Conditions

In the vicinity of the site, Aero Parkway, also known as KY 1017, is an east-west, four-lane divided roadway, with a posted speed limit of 45 mph. Ted Bushelman Boulevard, also known as KY 3159, is a north-south, two-lane roadway, with a posted speed limit of 45 mph.

Doering Drive is an east-west, three lane roadway including a center, two-way left turn lane, with a posted speed limit of 25 mph. Houston Road, also known as KY 842, is an east-west, five-lane roadway including left turn lanes and right turn lanes at various intersections, with a posted speed limit of 45 mph.

To determine the existing traffic volumes at the intersection of Aero Parkway and Ted Bushelman Boulevard, the intersection of Houston Road and Ted Bushelman Boulevard, as well as along Aero Parkway and Ted Bushelman Boulevard at the proposed access points, Bayer Becker conducted the following peak hour turning movement traffic counts:

- Aero Parkway and Ted Bushelman Boulevard, on Wednesday, January 6, 2016, from 7:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM.
- Houston Road and Ted Bushelman Boulevard, on Thursday, September 22, 2016, from 7:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM.

In addition to the peak hour turning movement traffic counts, Bayer Becker also performed automatic traffic counts of Aero Parkway and Ted Bushelman Boulevard near the proposed access points from Wednesday, December 16, 2015 through Friday, December 18, 2015.

The complete traffic count information is provided by attachment, Attachment B. The 2016 AM and PM peak hour existing traffic volumes are presented in Figure 1, Attachment C.

Projected Traffic

Trip generation for the proposed development at each of the sites was estimated using the data and methodology presented in the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 9th Edition*. Site trips generated during the AM and PM peak hours are presented in the following tables.

Land Use	ITE Code	Size	Units	AM Peak Hour			PM Peak Hour		
				Enter	Exit	Total	Enter	Exit	Total
Bosch Proposed Expansion									
Manufacturing	140	180.000	TSF	97	45	142	70	65	135

Land Use	ITE Code	Size	Units	AM Peak Hour			PM Peak Hour		
				Enter	Exit	Total	Enter	Exit	Total
CVG Site 6A-1									
Distribution Center	152	511.500	TSF	51	21	72	31	52	83

Land Use	ITE Code	Size	Units	AM Peak Hour			PM Peak Hour		
				Enter	Exit	Total	Enter	Exit	Total
CVG Site 6CE-1									
Shopping Center	820	10.500	TSF	24	15	39	63	69	132
After PM Internal Capture							37	41	78
34% PM Pass-By Trips							13	14	27
Fast-Food Restaurant with Drive-Through Window	934	3.200	TSF	88	84	172	79	72	151
After PM Internal Capture							49	45	94
49% AM/50% PM Pass-By Trips				43	41	84	25	22	47
Gasoline/Service Station with Convenience Market	945	4.300	TSF	180	173	353	210	209	419
After PM Internal Capture							182	180	362
62% AM/56% PM Pass-By Trips				112	107	219	102	101	203
Total Trips				292	272	564	352	350	702
Total External Trips				292	272	564	268	266	534
Total Pass-By Trips				155	148	303	140	137	277
Total New Trips				137	124	261	128	129	257

Land Use	ITE Code	Size	Units	AM Peak Hour			PM Peak Hour		
				Enter	Exit	Total	Enter	Exit	Total
CVG Site 6BW									
Department Store	875	43.500	TSF	16	9	25	41	40	81
After PM Internal Capture							33	32	65
Arts and Crafts Store	879	55.000	TSF	0	0	0	157	185	342
After PM Internal Capture							149	177	326
Total Trips				16	9	25	198	225	423
Total External Trips				16	9	25	182	209	391

Trip generation rate information is provided by attachment, Attachment D.

Peak hour trips generated by the proposed developments were distributed through the study area based upon existing traffic patterns in the area in accordance with the Kentucky Transportation Cabinet (KYTC) *Traffic Impact Study Requirements*. Trip distribution for entering site trips is presented in the attached Figures 2A, 2B, 2C, and 2D and for exiting site trips in attached Figures 3A, 3B, 3C, and 3D. Entering and exiting site traffic volumes are presented in the attached Figures 4A, 4B, 4C, 4D, and 4E, and Figures 5A, 5B, 5C, 5D, and 5E, respectively.

With the proposed expansion of the Bosch Steering facility, modifications to the existing parking areas associated with existing building #2 are expected. Specifically, access to Spiral Road is to be eliminated and new access is to be provided to Ted Bushelman Boulevard. As previously noted, a proposed cul-de-sac street on Ted Bushelman Boulevard, Proposed Access #3, located approximately 1,210 feet south of Aero Parkway, is to be constructed by others.

To estimate the trips associated with this modification, calculations were performed using data and methodology presented in the ITE *Trip Generation Manual, 9th Edition* for existing building #2. Trips generated during the AM and PM peak hours are presented in the following table.

Land Use	ITE Code	Size	Units	AM Peak Hour			PM Peak Hour		
				Enter	Exit	Total	Enter	Exit	Total
Bosch Existing Building #2									
Manufacturing	140	176.411	TSF	95	44	139	69	63	132

Peak hour trips generated by the Bosch existing building #2 were distributed through the study area based upon existing traffic patterns in the area in accordance with the KYTC *Traffic Impact Study Requirements*. Trip distribution for entering trips is presented in the attached Figure 2E and for exiting trips in attached Figure 3E. Entering and exiting traffic volumes are presented in the attached Figure 4F and Figure 5F, respectively.

To assess the future impact of the site traffic on the adjacent roadway network, volumes for the full build out year of 2017 and the horizon year of 2027 were evaluated. A growth rate of 0.75% compounded annually was applied to the 2016 existing traffic volumes to estimate the 2017 and 2027 no build traffic volumes. The growth rate was determined using historical traffic counts in the area of the site, along Turfway Road (KY 717) and Houston Road (KY 842), as obtained from the KYTC website in accordance with the KYTC *Traffic Impact Study Requirements*.

The historical traffic count data is provided by attachment, Attachment E. The 2017 no build traffic volumes are presented in Figure 6 and the 2027 no build traffic volumes in Figure 7, both attached.

The 2017 and 2027 build traffic volumes were obtained by adding the entering and exiting site traffic volumes from Figures 4A, 4B, 4C, 4D, and 4E and 5A, 5B, 5C, 5D, and 5E to the future 2017 no build traffic volumes from Figure 6 and to the future 2027 no build traffic volumes from Figure 7.

The 2017 build traffic volumes are presented in the attached Figure 8 and the 2027 build traffic volumes in the attached Figure 9.

Turn Lane Analysis

The need for turn lanes on Aero Parkway and Ted Bushelman Boulevard at the proposed access points was determined in accordance with the KYTC *Traffic Impact Study Requirements* using the Auxiliary Turn Lane Warrants and Turn Lane Lengths spreadsheet provided by KYTC.

Based on the analysis, the following turn lanes are warranted based on 2017 and 2027 build traffic volumes (including site traffic volumes associated with the Bosch proposed expansion and CVG sites):

- An eastbound right turn lane on Aero Parkway at Proposed Access #1.
- A westbound left turn lane on Aero Parkway at Proposed Access #1.
- A southbound left turn lane on Ted Bushelman Boulevard at Proposed Access #2.
- A southbound left turn lane on Ted Bushelman Boulevard at Proposed Access #3.

The turn lane analysis is provided by attachment, Attachment F.

While a northbound left turn lane on Ted Bushelman Boulevard at Proposed Access #3 is not warranted, it is recommended to provide proper alignment with the recommended southbound left turn lane.

Planned Improvements

To accommodate the identified left turn lane needs along Ted Bushelman Boulevard at the various proposed access points associated with the proposed expansion of the Bosch Automotive Steering facility and CVG Sites 6A-1, 6CE-1, and 6BW, as well as to accommodate additional future development along the corridor, CVG has requested funding from the Ohio Kentucky Indiana Regional Council of Governments (OKI) to provide for the widening of Ted Bushelman Boulevard.

According to the OKI application form completed, the Ted Bushelman Boulevard Improvements project involves adding an additional lane to Ted Bushelman Boulevard to create a center, two-way left turn lane, from Aero Parkway to Doering Drive. The project also includes maintaining the existing shared use path that is provided along the west side of Ted Bushelman Boulevard.

A copy of the Preliminary Concept Plan submitted as part of the OKI application is attached for reference, Attachment G.

It is understood that the Ted Bushelman Boulevard Improvements project has received a favorable recommendation from the appropriate OKI committee and it is anticipated that CVG will receive funding for the project. As such, the following calculations and analyses assume that a center, two-way left turn lane will be constructed as a local public agency (LPA) project with dedicated left turn lanes provided at the defined proposed access points.

Turn Lane Storage Lengths

The following storage lengths for the recommended turn lanes were calculated based on 2017 and 2027 build traffic volumes using the Auxiliary Turn Lane Lengths spreadsheet provided by KYTC:

- A 220' eastbound right turn lane on Aero Parkway at Proposed Access #1.
- A 220' westbound left turn lane on Aero Parkway at Proposed Access #1.
- A 220' southbound left turn lane on Ted Bushelman Boulevard at Proposed Access #2.
- A 220' northbound left turn lane on Ted Bushelman Boulevard at Proposed Access #3.
- A 220' southbound left turn lane on Ted Bushelman Boulevard at Proposed Access #3.
- A 220' northbound left turn lane on Ted Bushelman Boulevard at Proposed Access #4.

Storage length calculations are attached, Attachment H.

Intersection Level of Service Analysis

Level of service (LOS), as defined in the *Highway Capacity Manual 2010* (HCM), is a function of average delay encountered by the motorist. It is the standard used to evaluate traffic flow and delay on a segment of roadway. LOS takes into account such factors as speed, traffic volumes, and geometric features.

According to KYTC guidelines, the average intersection delay at an existing intersection shall not exceed 80 seconds and shall not increase more than 30 percent over the no build condition. In such cases where intersection delay or individual turning movements are shown to operate with delays greater than 80 seconds under the no build condition, delay shall not increase. Proposed intersections shall operate at an LOS C or better. Delay for individual turning movements and lane groups shall not exceed 80 seconds.

The criteria used by HCM for a signalized intersection are provided in the following table.

Level of Service	Delay Range (sec./veh.)	Expected Delay
A	≤ 10	Extremely Favorable Progression.
B	> 10 and ≤ 20	Good Progression.
C	> 20 and ≤ 35	Fair Progression.
D	> 35 and ≤ 55	Unfavorable Progression.
E	> 55 and ≤ 80	Poor Progression.
F	> 80	Excessive Traffic Delay.

LOS analysis of the intersection of Aero Parkway and Ted Bushelman Boulevard and the intersection of Houston Road and Ted Bushelman Boulevard was performed for 2016 existing conditions, 2017 no build and build conditions, and 2027 no build and build conditions using Highway Capacity Software (HCS2010). The signal timing for the intersections was obtained from KYTC (Attachment C) and optimized using the HCS2010 software.

The resulting LOS and the associated delay (seconds) for the AM and PM peak hours are provided in the following table.

LOS		AM Peak Hour					PM Peak Hour						
		2016		2017		2027		2016		2017		2027	
		Existing	No Build	Build	No Build	Build	Existing	No Build	Build	No Build	Build		
Aero Parkway and Ted Bushelman Boulevard													
EB	T	C (22.8)	C (22.9)	C (25.3)	C (23.8)	C (31.6)	C (20.8)	C (20.9)	B (18.2)	C (21.1)	C (26.6)		
	R	B (17.4)	B (17.4)	B (19.3)	B (17.5)	C (21.5)	C (20.0)	C (20.1)	B (18.1)	C (20.2)	C (26.4)		
	Approach	C (22.5)	C (22.5)	C (24.5)	C (23.4)	C (30.3)	C (20.6)	C (20.7)	B (18.2)	C (20.9)	C (26.6)		
WB	L	B (15.4)	B (15.5)	B (17.9)	B (16.1)	C (21.4)	C (20.8)	C (21.1)	C (34.1)	C (23.3)	C (29.6)		
	T	B (10.9)	B (10.9)	B (11.4)	B (11.0)	B (13.1)	B (15.2)	B (15.3)	B (12.3)	B (15.9)	B (15.6)		
	Approach	B (11.4)	B (11.4)	B (13.3)	B (11.6)	B (15.4)	B (16.3)	B (16.4)	B (18.6)	B (17.3)	B (19.6)		
NB	L	C (21.0)	C (21.0)	C (20.7)	C (21.0)	B (18.7)	C (22.3)	C (22.4)	C (27.0)	C (22.6)	C (30.1)		
	R	C (23.0)	C (23.0)	C (23.8)	C (23.2)	C (21.6)	C (20.2)	C (20.2)	C (22.1)	C (20.3)	C (25.3)		
	Approach	C (22.7)	C (22.7)	C (23.2)	C (22.9)	C (21.1)	C (21.9)	C (21.9)	C (25.4)	C (22.1)	C (28.6)		
Overall Intersection		B (20.0)	C (20.0)	C (21.7)	C (20.7)	C (25.4)	B (18.4)	B (18.4)	B (19.8)	B (19.0)	C (23.2)		
Houston Road and Ted Bushelman Boulevard													
EB	L	B (15.1)	B (15.1)	C (31.5)	C (27.2)	C (33.2)	C (33.5)	C (24.4)	D (55.0)	C (26.6)	D (53.8)		
	T	B (13.4)	B (13.4)	C (23.5)	C (23.9)	C (23.9)	C (21.4)	B (15.4)	C (23.5)	B (16.5)	C (21.0)		
	R	B (11.6)	B (11.6)	C (20.3)	C (20.4)	C (20.4)	B (15.8)	B (11.6)	B (17.9)	B (11.6)	B (15.2)		
	Approach	B (13.6)	B (13.6)	C (25.7)	C (24.2)	C (26.4)	C (22.0)	B (15.9)	C (28.0)	B (17.1)	C (25.3)		
WB	L	B (15.6)	B (15.6)	C (27.3)	C (28.0)	C (28.0)	C (27.2)	B (20.0)	C (30.9)	C (22.0)	C (28.8)		
	T	B (12.5)	B (12.5)	C (22.0)	C (22.1)	C (22.1)	C (23.2)	B (16.5)	C (25.0)	B (17.3)	C (21.9)		
	R	B (11.9)	B (11.9)	C (22.0)	C (21.0)	C (22.1)	B (19.2)	B (14.1)	C (24.9)	B (14.3)	C (21.5)		
	Approach	B (12.5)	B (12.5)	C (22.0)	C (22.0)	C (22.2)	C (22.4)	B (16.0)	C (25.0)	B (16.7)	C (21.9)		
NB	L	C (26.1)	C (26.9)	C (29.2)	C (28.3)	C (29.2)	C (28.1)	C (30.6)	D (51.3)	C (30.7)	D (51.9)		
	T	C (26.2)	C (26.9)	C (29.4)	C (28.3)	C (29.4)	C (28.3)	C (30.9)	D (52.0)	C (31.1)	D (54.1)		
	R	C (26.0)	C (26.8)	C (29.1)	C (28.2)	C (29.1)	C (27.7)	C (29.9)	D (50.2)	C (29.9)	D (49.9)		
	Approach	C (26.1)	C (26.9)	C (29.3)	C (28.3)	C (29.3)	C (28.1)	C (30.6)	D (51.5)	C (30.8)	D (52.8)		
SB	LT	C (27.7)	C (25.8)	C (29.1)	C (28.3)	C (29.3)	C (33.3)	C (30.3)	D (51.3)	C (32.8)	D (54.9)		
	R	C (26.2)	C (25.5)	C (27.3)	C (27.1)	C (27.4)	C (28.9)	C (25.6)	D (40.3)	C (25.9)	D (38.9)		
	Approach	C (27.4)	C (26.6)	C (28.5)	C (28.0)	C (28.7)	C (31.7)	C (28.6)	D (46.9)	C (30.3)	D (48.5)		
Overall Intersection		B (14.9)	B (14.9)	C (25.2)	C (24.0)	C (25.6)	C (23.8)	B (18.3)	C (31.7)	B (19.3)	C (29.7)		

Based on the LOS analysis, the Bosch proposed expansion and the proposed development associated with CVG Sites 6A-1, 6CE-1, and 6BW will not significantly decrease the LOS nor significantly increase delay at the intersection of Aero Parkway and Ted Bushelman Boulevard or at the intersection of Houston Road and Ted Bushelman Boulevard.

The overall intersection LOS for Aero Parkway and Ted Bushelman Boulevard is expected to vary from B to C with a delay of 25.4 seconds or less through 2027 build conditions. Likewise, the LOS for the individual movements at the intersection are also expected to vary from B to C conditions with delays ranging from 10.9 seconds to 34.1 seconds through 2027 build.

The overall intersection LOS for Houston Road and Ted Bushelman Boulevard is expected to vary from B to C with a delay of 31.7 seconds or less through 2027 build conditions. The LOS for the individual movements at the intersection are anticipated to vary from B to D with delays ranging from 11.6 seconds to 55.0 seconds through 2027 build conditions.

Complete LOS analysis is provided by attachment, Attachment I.

While the overall LOS and delay at the intersection of Houston Road and Ted Bushelman Boulevard is not significantly impacted due to the Bosch proposed expansion and the proposed development associated with CVG Sites 6A-1, 6CE-1, and 6BW, in an effort to improve the LOS for individual movements at the intersection, additional analysis was performed assuming modifications to the existing signal timing plan. Specifically, the phasing of Ted Bushelman Boulevard was altered such that the northbound and southbound movements/phases are to operate simultaneously as opposed to the split phasing that currently occurs. To accommodate this proposed signal timing, restriping of the existing pavement markings associated with southbound Ted Bushelman Boulevard are necessary to provide proper alignment with the northbound approach. Currently, the southbound approach consists of a striped median, a shared left turn and through lane, and a separate right turn lane. The existing striped median could be converted to a designated left turn lane, which would also allow for a separate through lane, and the separate right turn lane would remain. This proposed configuration mirrors the northbound approach. To further improve the LOS for individual movements at the intersection during the PM peak hour, the proposed signal timing also included protected left turn movements on the eastbound and southbound approaches and overlapping right turn movements on the southbound and westbound approaches.

The resulting LOS and the associated delay (seconds) of the additional analysis for the AM and PM peak hours of Houston Road and Ted Bushelman Boulevard, 2017 and 2027 build conditions, are provided in the following table. The LOS and delays for 2016 existing conditions and 2017 and 2027 no build conditions are unchanged from the previous table and are provided for comparison purposes.

LOS		AM Peak Hour					PM Peak Hour				
		2016		2017		2027	2016		2017		2027
		Existing	No Build	Build	No Build	Build	Existing	No Build	Build	No Build	Build
Houston Road and Ted Bushelman Boulevard											
EB	L	B (15.1)	B (15.1)	B (17.0)	C (27.2)	B (16.0)	C (33.5)	C (24.4)	C (23.3)	C (26.6)	C (31.9)
	T	B (13.4)	B (13.4)	B (13.2)	C (23.9)	B (12.2)	C (21.4)	B (15.4)	B (17.4)	B (16.5)	C (20.6)
	R	B (11.6)	B (11.6)	B (11.4)	C (20.4)	B (10.5)	B (15.8)	B (11.6)	B (12.7)	B (11.6)	B (14.9)
	Approach	B (13.6)	B (13.6)	B (14.2)	C (24.2)	B (13.2)	C (22.0)	B (15.9)	B (18.2)	B (17.1)	C (22.0)
WB	L	B (15.6)	B (15.6)	B (15.3)	C (28.0)	B (14.4)	C (27.2)	B (20.0)	C (21.8)	C (22.0)	C (28.3)
	T	B (12.5)	B (12.5)	B (12.3)	C (22.1)	B (11.3)	C (23.2)	B (16.5)	C (32.4)	B (17.3)	C (34.9)
	R	B (11.9)	B (11.9)	B (12.3)	C (21.0)	B (11.3)	B (19.2)	B (14.1)	B (17.2)	B (14.3)	C (21.0)
	Approach	B (12.5)	B (12.5)	B (12.4)	C (22.0)	B (11.4)	C (22.4)	B (16.0)	C (27.8)	B (16.7)	C (30.8)

LOS	AM Peak Hour					PM Peak Hour					
	2016	2017		2027		2016	2017		2027		
	Existing	No Build	Build	No Build	Build	Existing	No Build	Build	No Build	Build	
Houston Road and Ted Bushelman Boulevard											
NB	L	C (26.1)	C (26.9)	B (19.7)	C (28.3)	C (21.2)	C (28.1)	C (30.6)	C (33.2)	C (30.7)	C (34.8)
	T	C (26.2)	C (26.9)	B (19.2)	C (28.3)	C (20.6)	C (28.3)	C (30.9)	C (33.3)	C (31.1)	C (34.8)
	R	C (26.0)	C (26.8)	B (19.0)	C (28.2)	C (20.4)	C (27.7)	C (29.9)	C (32.5)	C (29.9)	C (34.0)
	Approach	C (26.1)	C (26.9)	B (19.3)	C (28.3)	C (20.7)	C (28.1)	C (30.6)	C (33.2)	C (30.8)	C (34.7)
SB	L	C (27.7)	C (25.8)	C (22.0)	C (28.3)	C (23.7)	C (33.3)	C (30.3)	C (31.3)	C (32.8)	D (36.4)
	T	-	-	B (19.3)	-	C (20.6)	-	-	B (17.9)	-	C (20.7)
	R	C (26.2)	C (25.5)	C (20.1)	C (27.1)	C (21.5)	C (28.9)	C (25.6)	B (17.3)	C (25.9)	C (20.8)
	Approach	C (27.4)	C (26.6)	C (21.1)	C (28.0)	C (22.7)	C (31.7)	C (28.6)	C (24.8)	C (30.3)	C (29.1)
Overall Intersection		B (14.9)	B (14.9)	B (15.0)	C (24.0)	B (14.5)	C (23.8)	B (18.3)	C (24.3)	B (19.3)	C (27.7)

Based on the additional LOS analysis, the overall intersection LOS for Houston Road and Ted Bushelman Boulevard is expected to vary from B to C with a delay of 27.7 seconds or less through 2027 build conditions (as compared to the previously reported 31.7 seconds of delay). The LOS for the individual movements at the intersection are anticipated to vary from B to C with delays ranging from 10.5 seconds to 34.9 seconds through 2027 build conditions with the exception of the southbound left turn movement which is expected to have an LOS of D and a delay of 36.4 seconds (PM peak hour, 2027 build conditions) (as compared to the previously reported 55.0 seconds of delay).

The additional LOS analysis is provided in Attachment J.

LOS analysis of the proposed access points along Aero Parkway and Ted Bushelman Boulevard was performed for 2017 build conditions and 2027 build conditions also using HCS2010.

The resulting LOS and the associated delay (seconds) for the proposed access points for the AM and PM peak hours are provided in the following table.

LOS		AM Peak Hour		PM Peak Hour	
		2017	2027	2017	2027
		Build		Build	
Aero Parkway and Proposed Access #1					
WB	L	B (11.7)	B (12.2)	A (9.3)	A (9.5)
NB	L	E (42.9)	F (53.0)	F (120.8)	F (165.9)
	R	B (12.7)	B (13.2)	A (9.9)	B (10.1)
	Approach	C (23.4)	D (27.3)	F (94.5)	F (128.9)
Ted Bushelman Boulevard and Proposed Access #2					
SB	L	A (8.1)	A (8.1)	A (8.7)	A (8.8)
WB	LR	B (14.3)	B (14.7)	E (42.1)	E (49.1)
	Approach	B (14.3)	B (14.7)	E (42.1)	E (49.1)
Ted Bushelman Boulevard and Proposed Access #3					
NB	L	A (7.8)	A (7.8)	A (8.9)	A (9.0)
SB	L	A (8.1)	A (8.2)	A (8.7)	A (8.6)
WB	L	C (16.1)	C (16.5)	E (40.4)	E (40.0)
	TR	B (10.3)	B (10.4)	B (12.0)	B (11.7)
	Approach	B (12.6)	B (12.8)	D (28.3)	D (28.0)
WB	L	C (16.4)	C (16.8)	E (36.3)	E (36.3)
	TR	A (9.5)	A (9.6)	B (12.8)	B (13.1)
	Approach	C (15.1)	C (15.5)	D (29.7)	D (29.8)

LOS		AM Peak Hour		PM Peak Hour	
		2017	2027	2017	2027
		Build		Build	
Ted Bushelman Boulevard and Proposed Access #4					
NB	L	A (7.8)	A (7.8)	A (9.0)	A (9.1)
EB	LR	B (10.8)	B (10.9)	C (16.5)	C (17.1)
	Approach	B (10.8)	B (10.9)	C (16.5)	C (17.1)
Ted Bushelman Boulevard and Proposed Access #5					
EB	R	A (9.6)	A (9.6)	B (14.2)	B (14.5)
	Approach	A (9.6)	A (9.6)	B (14.2)	B (14.5)

Based on the LOS analysis, the Bosch proposed expansion and the proposed development associated with CVG Sites 6A-1, 6CE-1, and 6BW will not significantly decrease the LOS nor significantly increase delay along Aero Parkway or Ted Bushelman Boulevard.

The LOS associated with the left turn movement on Aero Parkway at Proposed Access #1 is estimated to vary from A to B with delays of 12.2 seconds or less through 2027 build conditions. The LOS for the northbound left turn movement on Proposed Access #1 will vary from E to F with delays ranging from 42.9 seconds to 165.9 seconds, while the LOS for the northbound right turn movement on Proposed Access #1 will vary from A to B with delays less than 13.2 seconds. Because of the higher delay anticipated for the northbound left turning movement, a separate left turn lane and right turn lane are to be provided along Proposed Access #1.

The left turn movements on Ted Bushelman Boulevard at Proposed Access #2, Proposed Access #3, and Proposed Access #4 are expected to operate at an LOS of A with a delay of 9.1 seconds or less through 2027 build conditions. The LOS for the movements occurring on Proposed Access #2, Proposed Access #3, Proposed Access #4, and Proposed Access #5 vary from A to E with delays ranging from 9.5 seconds to 49.1 seconds.

As previously noted, the complete LOS analysis is provided by attachment, Attachment I.

Findings and Recommendations

Based on the traffic evaluation contained herein, the following roadway improvements are recommended to accommodate the proposed expansion of the Bosch Automotive Steering facility and CVG Sites 6A-1, 6CE-1, and 6BW:

- A 220' eastbound right turn lane on Aero Parkway at Proposed Access #1.
- A 220' westbound left turn lane on Aero Parkway at Proposed Access #1.
- A 220' southbound left turn lane on Ted Bushelman Boulevard at Proposed Access #2.
- A 220' northbound left turn lane on Ted Bushelman Boulevard at Proposed Access #3.
- A 220' southbound left turn lane on Ted Bushelman Boulevard at Proposed Access #3.

Bayer Becker has prepared Roadway Plans for Robert Bosch Automotive Steering, dated August 2016, which provides for the design of an eastbound right turn lane and a westbound left turn lane on Aero Parkway at Proposed Access #1. The plans were submitted to KYTC and have been approved by KYTC with a permit issued date of September 12, 2016.

It is anticipated that the proposed eastbound right turn lane and proposed westbound left turn lane on Aero Parkway at Proposed Access #1 will be constructed either late 2016 or early 2017, before the opening of the Bosch Automotive Steering facility proposed expansion.

As previously noted, there are planned improvements associated with Ted Bushelman Boulevard, including the widening of the roadway to create a center, two-way left turn lane from Aero Parkway to Doering Drive.

Therefore, the Ted Bushelman Boulevard Improvements project, which has an estimated construction date of 2018, will provide the southbound left turn lane at Proposed Access #2, the northbound left turn lane at Proposed Access #3, and the southbound left turn lane at Proposed Access #3. Likewise, the following additional left turn lane on Ted Bushelman Boulevard will also be provided for as part of the Ted Bushelman Boulevard Improvements project:

- A 220' northbound left turn lane on Ted Bushelman Boulevard at Proposed Access #4.

Based upon engineering judgement and the calculations and analysis contained herein, the proposed expansion of the Bosch Automotive Steering facility and the proposed development associated with CVG Sites 6A-1, 6CE-1, and 6BW, including the recommended roadway improvements, will not significantly impact operations on the adjacent roadway network.

Please review the aforementioned analysis and the associated attachments. Should you have any questions or additional comments, please contact me at (859) 261-1113.

Sincerely,



Kathryn M. Dillenburger, P.E.

cc: Debbie Conrad, CVG International Airport
Robert Patterson, Robert Bosch Automotive Steering LLC
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