FINAL ENVIRONMENTAL ASSESSMENT

FOR

PROPOSED AIRPORT DEVELOPMENT

AT

Appleton International Airport
Appleton, Wisconsin

prepared by

Westwood Professional Services, Inc.
One Systems Drive
Appleton, WI 54914-1654

under contract with

WISCONSIN DEPARTMENT OF TRANSPORTATION

BUREAU OF AERONAUTICS

The Airport is proposing to construct a geothermal system as an energy efficient means of heating and cooling the passenger terminal building and the new addition to the passenger terminal building.

Evidence of compliance with the Wisconsin Environmental Policy Act is indicated by the Wisconsin Department of Transportation signature below.

David M. Greene — 7/15/2024

WisDOT, Director, Bureau of Aeronautics — Date

This environmental assessment becomes a federal document when evaluated and signed by the responsible Federal Aviation Administration (FAA) official.

Date: 2024.07.16 11:31:16 -05'00' — 7/16/2024

Responsible FAA Official — Date

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List of Acronyms and Abbreviations

AC	Advisory Circular
Airport	Appleton International Airport
APE	Area of Potential Effects
AQS	Air Quality System
ARFF	Airport Rescue and Fire Fighting
ACTC	Air Traffic Control Tower
BMP	Best Management Practice
BRRTS	Bureau for Remediation and Redevelopment
CAA	Clean Air Act
CFR	Code of Federal Regulations
CLEAN	Contaminated Lands Environmental Action Network
COP	Coefficient of Performance
dBA	Decibels adjusted (or weighted)
DNL	Day-Night average sound Level
DOT	Department Of Transportation
EA	Environmental Assessment
ECIP	Erosion Control Implementation Plan
EIS	Environmental Impact Statement
EV	Electric Vehicle
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation
fbgs	Feet Below Ground Surface
FBO	Fixed Base Operator
FEMA	Federal Emergency Management Agency
FONSI	Finding Of No Significant Impact
FPPA	Farmland Protection Policy Act
GA	General Aviation
GIS	Geographical Information System
GPS	Global Positioning System
HDPE	High-Density Polyethylene
HIRLs	High Intensity Runway Lights
HVAC	Heating, Ventilation, and Air Conditioning
ILS	Instrument Landing System
IGSHPA	International Ground Source Heat Pump Association
IPaC	Information for Planning and Consultation
LEED	Leadership in Energy and Environmental Design
MALSR	Medium intensity Approach Lighting System with Runway alignment indicator lights
MSL	Mean Sea Level
NAAQS	National Ambient Air Quality Standards
NDB	Non-Directional Beacon
NEPA	National Environmental Policy Act

NHI	Natural Heritage Inventory
NRI	Nationwide Rivers Inventory
PAPI	Precision Approach Path Indicator
Part 139	Part 139 Certification of Airports, Subpart D
PV	Photovoltaic
ROW	Right-Of-Way
REILs	Runway End Identifier Lights
RNAV	Runway Navigation - GPS
SHPO	State Historic Preservation Officer
SHSW	State Historical Society of Wisconsin
SIP	State Implementation Plan
Sponsor	Outagamie County
USEPA	United States Environmental Protection Agency
USFWS	United States Fish & Wildlife Services
VASI	Visual Approach Slope Indicators
VOR/DME	VHF Omni-directional radio Range/Distance Measuring Equipment
WDNR	Wisconsin Department of Natural Resources
WisDOT	Wisconsin Department of Transportation

CHAPTER 1 - PURPOSE AND NEED

1.1 Introduction

The Appleton International Airport (Airport) is located in the Village of Greenville, Outagamie County, Wisconsin; approximately five miles west of downtown Appleton. The Airport primarily serves the Fox Cities communities, which include the cities of Appleton, Kaukauna, Menasha, and Neenah, the villages of Combined Locks, Greenville, Hortonville, Kimberly, Little Chute, Fox Crossing, Harrison, and Sherwood, and the towns of Kaukauna, Neenah, Buchanan, Clayton, Freedom, Grand Chute, and Harrison. **Figure 1-1** provides a graphic representation of the Airport's location.

The Airport is proposing to construct a geothermal system as an energy efficient means of heating and cooling the terminal building and the new addition to the terminal building. The addition to the passenger terminal building was approved under a previous environmental review process.

The Airport is owned and operated by Outagamie County (Sponsor). The Sponsor petitioned the Wisconsin Secretary of Transportation, under Wisconsin Statutes Chapter 114.33 for Federal and/or State aid to improve the Airport[1]. The desired improvements included installing a geothermal system for the heating and cooling needs of the terminal building, including the new addition to the terminal building.

The Airport is included in both the National Plan of Integrated Airport Systems[2] and in the Wisconsin State Airport System Plan[3], which allows for the possibility of both federal and state aid. Federal aid in a project requires environmental review pursuant to the National Environmental Policy Act (NEPA)[4]. NEPA requires that environmental information is made available to public officials and citizens before decisions are made and before actions are taken.

An Environmental Assessment (EA) is a concise public document, prepared in compliance with NEPA, that discusses the purpose and need for an action, alternatives to such action, and provides sufficient evidence and analysis of impacts to determine whether to prepare an Environmental Impact Statement (EIS) or Finding of No Significant Impact (FONSI). The intent of this EA is to provide the environmental documentation to assist local, state, and federal officials and the public in evaluating the proposed action.

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[1] Wisconsin Statutes Chapter 114: https://docs.legis.wisconsin.gov/statutes/statutes/114.pdf

[2] National Plan of Integrated Airport Systems: https://www.faa.gov/airports/planning_capacity/npias

[3] Wisconsin State Airport System Plan 2030:
http://wisconsindot.gov/Pages/projects/multimodal/sasp/air2030-chap.aspx

[4] National Environmental Policy Act: https://ceq.doe.gov/

This EA is broken down into seven chapters. Chapter 2 provides discussion of alternatives, Chapter 3 discusses the affected environment, Chapters 4 and 5 addresses the environmental consequences, Chapter 6 describes the public coordination and participation, and Chapter 7 provides a list of personnel involved with preparing this document.

1.2 Project Purpose and Need

The 2021 Aviation Climate Action Plan[5] describes approaches to put the aviation sector on a path toward achieving net zero emissions by 2050. While the contribution from airports to the aviation sector's emissions is relatively modest compared to jet fuel emissions, the 2021 Aviation Climate Action Plan includes airports as needing to contribute to the reduction goals. In addition to emission reductions, airports are to play a lead role in efforts to strengthen the nation's aviation infrastructure against the impacts of climate change and increase the sector's resilience to those impacts.

The new passenger terminal area is required to accommodate additional gates because of the current and projected passenger usage as well as allow for the carriers transitioning to larger aircraft. The passenger terminal project went through a previous NEPA review process. The new passenger terminal area is scheduled to be operational in 2025.

A heating and cooling system will be required for the passenger terminal addition and offers the ability to upgrade the existing passenger terminal's heating and cooling system to a more energy efficient system during the construction. However, the NEPA review for the addition to the passenger terminal did not specify that the heating and cooling system would be a geothermal heat pump type system. A geothermal heat pump type system for the passenger terminal would support the climate action plan goals.

The Airport is constructing a 66,000 square foot addition onto the passenger terminal building. The Airport is proposing to construct a geothermal system as an energy efficient means of heating and cooling the passenger terminal building and the new addition to the passenger terminal building.

In addition to working towards the 2021 Aviation Climate Action Plan goals, the proposed geothermal system would fit the Federal Aviation Administration (FAA) guidance in terminal design. The FAA published an Advisory Circular (AC) document for Airport Terminal Planning, AC No. 150/5360-13A[6]. Chapter 9 of the AC Airport Terminal Planning document discusses sustainability in terminal planning. Section 9.4.2.1 states "A key sustainability consideration in building design is efficient energy use and energy waste." The proposed geothermal system would support efficient energy use in the passenger terminal.

There are several reasons why geothermal systems can be more energy efficient than traditional heating, ventilation, and air conditioning (HVAC) systems. The primary reason for

[5] https://www.faa.gov/sites/faa.gov/files/2021-11/Aviation_Climate_Action_Plan.pdf

[6] U.S. Department of Transportation – Federal Aviation Administration: https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC-150-5360-13A-Airport-Terminal-Planning.pdf

the increased efficiency is a higher coefficient of performance (COP). The COP is a measure of the efficiency of a heating or cooling system and represents the ratio of the heat output to the energy input. Since geothermal systems move heat rather than generate it through combustion, they can achieve higher COP values. Reduced energy input to achieve the desired heating and cooling output means fewer greenhouse gas emissions.

1.3 Requested Federal Action

NEPA requires that environmental information is available to public officials and citizens before decisions are made and before actions are taken. To fulfill the requirements of NEPA, FAA Order 5050.4B[7] and FAA Order 1050.1F[8] specify how the FAA will consider environmental impacts associated with a Federal action. This EA was prepared in accordance with FAA orders 5050.4B and 1050.1F for the proposed development at the Airport.

The FAA will evaluate the EA and either issue a FONSI or request that an EIS be completed.

If the preferred alternative is selected and a FONSI issued, final design could begin with construction to follow.

1.4 Other Actions

Ongoing Airport improvement projects and contemplated actions at the airport are listed below:

- Construct Phase I of the passenger terminal addition (current construction)
- Expand terminal apron (current construction)
- Construct Phase II of the passenger terminal addition (2024)
- Construct microgrids and electric vehicle chargers (2024)
- Construct Phase III of the passenger terminal addition (2025-2026)
- Construct new air traffic control tower (2028)
- Construction runway extension (2030-2031)

The Airport is within the Wisconsin Northeast Transportation Region. The Wisconsin Department of Transportation (WisDOT) is planning several projects[9] in the northeast region, two of which are relatively near the Airport.

[7] National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions, U.S. Department of Transportation, Federal Aviation Administration, April 28, 2006: https://www.faa.gov/airports/resources/publications/orders/environmental_5050_4

[8] Environmental Impacts: Policies and Procedures, U.S. Department of Transportation, Federal Aviation Administration, July 16, 2015: https://www.faa.gov/documentLibrary/media/Order/FAA_Order_1050_1F.pdf

[9] Northeast Transportation Region: http://www.dot.wisconsin.gov/projects/ne.htm

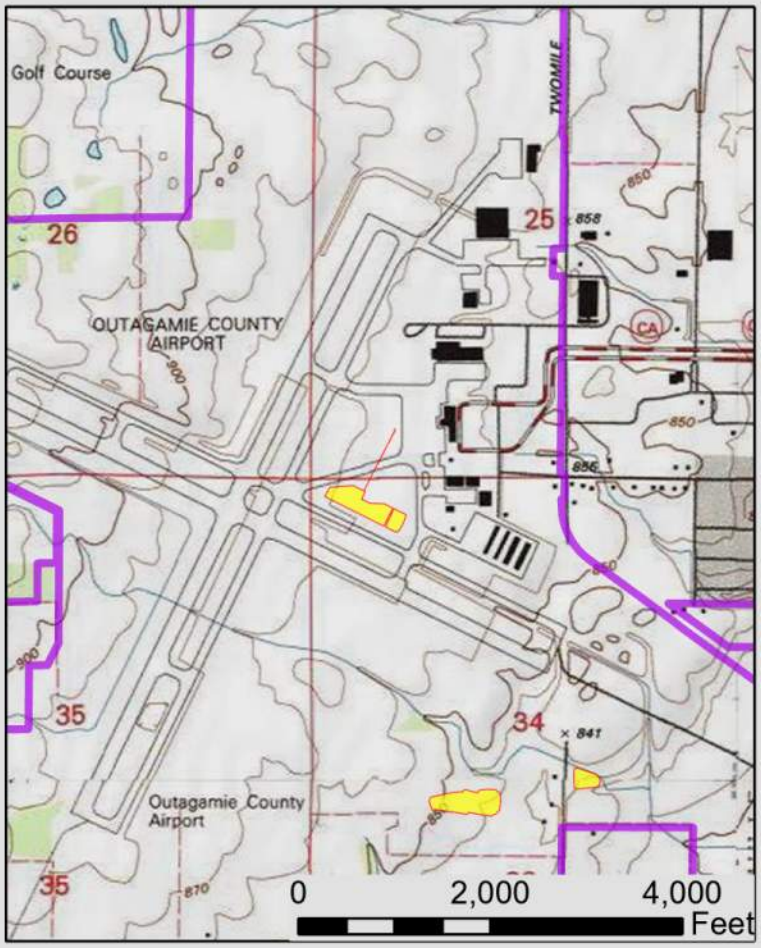
I-41 Expansion Project (De Pere to Appleton)
The project will reconstruct and expand 23 miles of I-41 from four lanes to six lanes between WIS 96 (Wisconsin Avenue) in Appleton and County F (Scheuring Road) in De Pere[10].

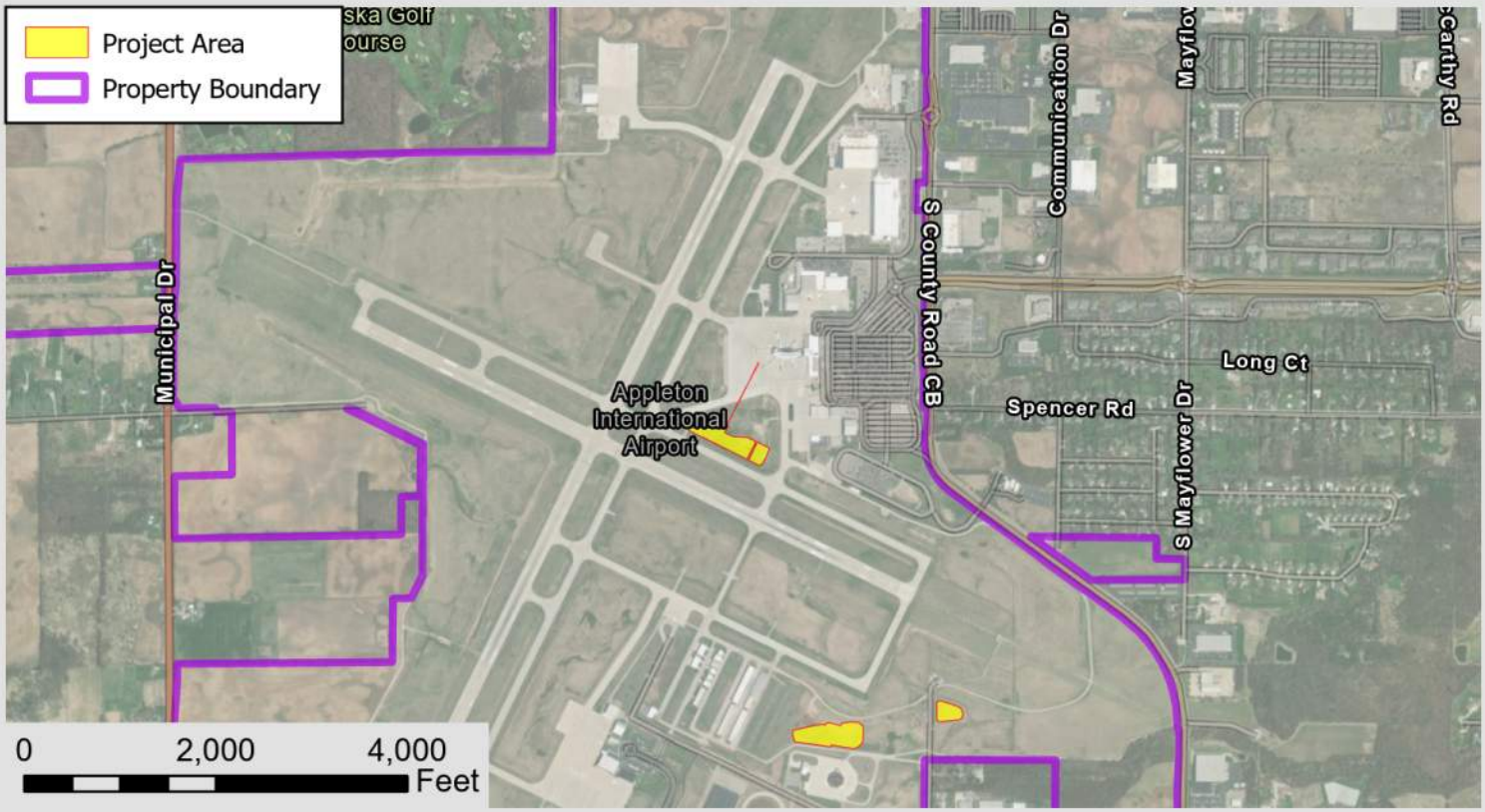
Wis 76 / School Road Intersection Project
Project ID 6430-20-00 is located at the intersection of WIS 76/School Road, 0.8 miles south of WIS 15. Construction is currently scheduled for 2024. The intersection is currently a two-way stop control intersection with two-lane rural roads on all four legs of the intersection. A multi-use trail crosses the west leg of School Road and runs south within the right-of-way (ROW) on the west side of the south leg of WIS 76[11].

Figure 1-2 shows the Airport property with respect to locations of several contemplated actions by the Wisconsin Department of Transportation.

[10] https://i41project.wisconsindot.gov/

[11] https://wisconsindot.gov/Pages/projects/by-region/ne/wis76schoolroad/default.aspx





Westwood

1 Systems Drive
Appleton, WI 54914
(920) 735-6900
www.westwoodps.com

N W E S

GEOTHERMAL ENVIRONMENTAL ASSESSMENT

LOCATION MAP

APPLETON INTERNATIONAL AIRPORT
VILLAGE OF GREENVILLE, OUTAGAMIE COUNTY, WISCONSIN

Project Manager:		SCALE: 1 in = 2,000 ft
Project Engineer:		
Drawn By:	JCW	PROJECT NO. R3001381.00
Checked By:	BDW	
Date:	1/31/2024	FIGURE NO. 1-1

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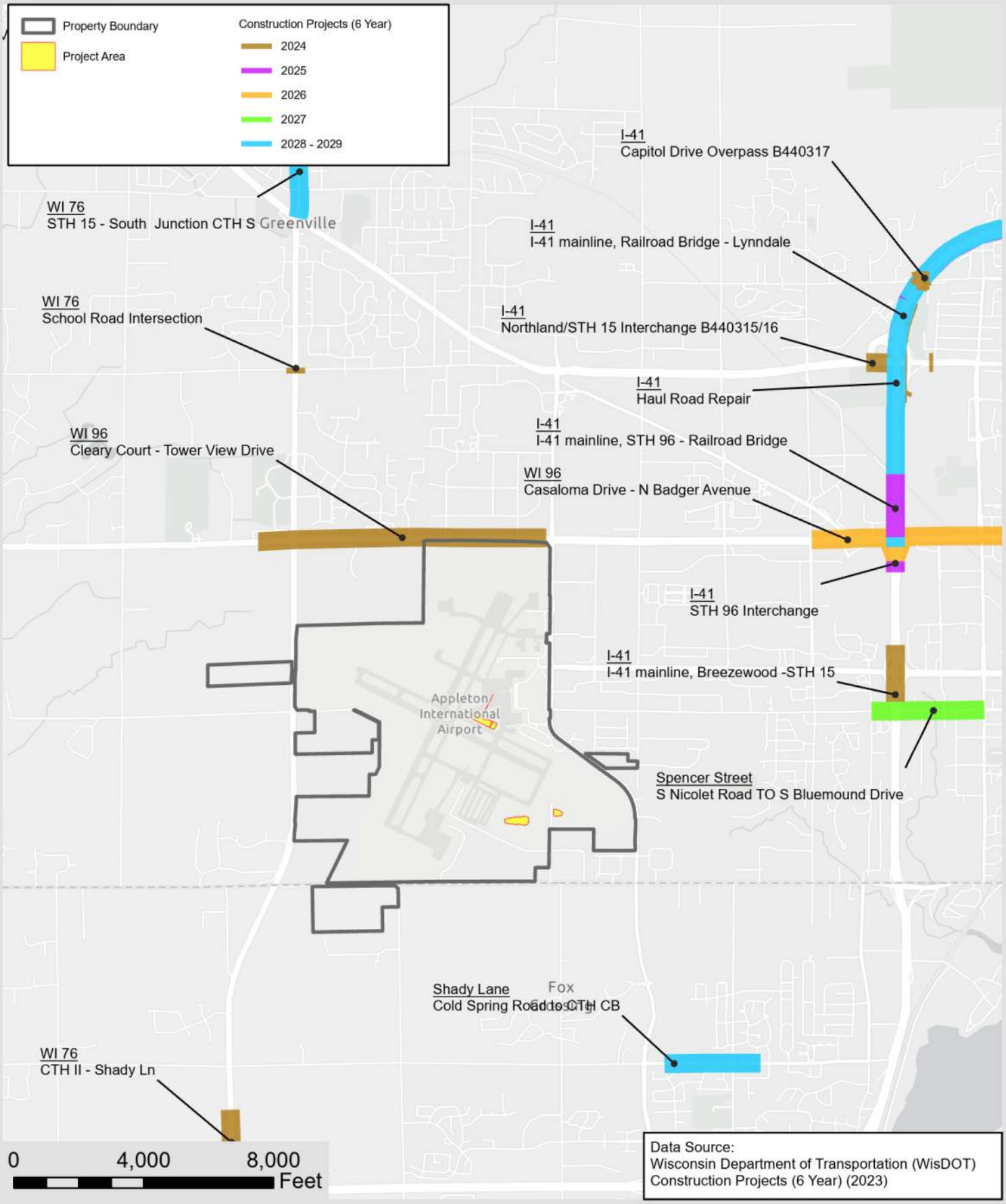

Westwood
1 Systems Drive
Appleton, WI 54914
(920) 735-6900
www.westwoodps.com

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GEOTHERMAL ENVIRONMENTAL ASSESSMENT

OTHER CONTEMPLATED ACTIONS

APPLETON INTERNATIONAL AIRPORT
VILLAGE OF GREENVILLE, OUTAGAMIE COUNTY, WISCONSIN

Project Manager:		SCALE: 1 in = 4,000 ft
Project Engineer:		
Drawn By:	JCW	PROJECT NO. R3001381.00
Checked By:	BDW	
Date:	1/31/2024	FIGURE NO. 1-2

F:\TR\JOBS\E2422A21 ATW Terminal Apron\Environmental\2023 Geothermal EA\GIS\EnvAssessmentMaps.aprx [Other Contemplated Actions Map]
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CHAPTER 2 - ALTERNATIVES

The objective of this chapter is to identify reasonable alternatives which accommodate the purpose and need identified in Chapter 1. The Council on Environmental Quality Regulations requires evaluation of alternatives (Sec. 1502.14) for projects to be compliant with NEPA[12]. FAA requirements of environmental assessments for the analysis of alternatives are provided in FAA Order 5050.4B, NEPA Implementing Instructions for Airport Actions[13] and FAA Order 1050.1F, Environmental Impacts: Policies and Procedures[14]. In general, the greater degree of impacts the project would have the wider range of alternatives that should be evaluated. The objective of the alternatives analysis is to inform decision makers and the public of feasible alternatives, which accommodate the purpose and need, and avoid or minimize adverse impacts or enhance the quality of the human environment.

An alternative is considered not reasonable if it does not meet the identified purpose and need, or where the environmental impacts are excessive, particularly when compared to other alternatives. An alternative is also considered not feasible if it is neither reasonable nor practical to perform or where the cost of implementation would likely exceed the benefits.

2.1 Background

The 2021 Aviation Climate Action Plan[15] describes approaches to put the aviation sector on a path toward achieving net zero emissions by 2050. The Aviation Climate Action Plan sought to mitigate the environmental impact of air travel by reducing greenhouse gas emissions, improving fuel efficiency, and fostering innovation in sustainable aviation technologies.

While the contribution from airports to the aviation sector's emissions is relatively modest compared to jet fuel emissions, the 2021 Aviation Climate Action Plan includes airports as needing to contribute to the reduction goals. In addition to emission reductions, airports are to play a lead role in efforts to strengthen the nation's aviation infrastructure against the impacts of climate change and increase the sector's resilience to those impacts.

To assist with meeting the goals of the 2021 Aviation Climate Action Plan the Airport is proposing to construct a geothermal system to heat and cool the existing and new addition to the passenger terminal building. The passenger terminal is currently being expanded to

[12] Council on Environmental Quality Regulations Section 1502.14: https://www.ecfr.gov/cgi-bin/text-idx?SID=4188688c7c967c02d0fc1d98d1630b83&mc=true&node=se40.37.1502_114&rgn=div8

[13] FAA Order 5050.4B, NEPA Implementing Instructions: https://www.faa.gov/regulations_policies/orders_notices/index.cfm/go/document.information/documentID/14836

[14] FAA Order 1050.1F, Environmental Impacts: Policies and Procedures: https://www.faa.gov/regulations_policies/orders_notices/index.cfm/go/document.current/documentnumber/1050.1

[15] https://www.faa.gov/sites/faa.gov/files/2021-11/Aviation_Climate_Action_Plan.pdf

accommodate additional gates because of the current and projected passenger usage as well as allow for larger aircraft.

In addition to working towards the 2021 Aviation Climate Action Plan goals, the proposed geothermal system would fit the FAA guidance in terminal design. The FAA published an Advisory Circular (AC) document for Airport Terminal Planning, AC No. 150/5360-13A[16]. Chapter 9 of the AC Airport Terminal Planning document discusses sustainability in terminal planning. Section 9.4.2.1 states "A key sustainability consideration in building design is efficient energy use and energy waste." The proposed geothermal system would support efficient energy use in the terminal. **Figure 2-1** provides a graphic representation of the proposed geothermal borehole field location and excess material stockpile locations on the Airport.

The Airport has been incorporating various sustainable initiatives throughout airport operations to help achieve the net zero emissions by 2050 goal. Below is a list of some of the sustainable projects the Airport has implemented or is in the process of incorporating.

- Facilities Assessment – The facilities assessment analyzed energy usage throughout various buildings owned by the Airport. Many improvements were made based on the results of this assessment, such as lighting upgrades and installing room occupancy sensors.
- Ground Power and Pre-Conditioned Air Units in Passenger Terminal - Ground power and pre-conditioned air units provide external power and climate control to aircraft while waiting at a gate. Typically, aircrafts will use their self-contained auxiliary power unit for electricity and HVAC inside the aircraft, which requires the aircraft to idle using jet fuel.
- Solar Thermal Hot Water System - A solar thermal hot water system was installed to assist with the passenger terminal building's hot water needs.
- FAA Sustainability Master Plan Pilot Program - This program sought to make sustainability a primary consideration in airport planning. The Airport was selected as one of 10 airports to participate in the pilot program, which allowed the Airport to progress its sustainability initiatives.
- Photovoltaic Panels (Main Concourse) - The 45-kW photovoltaic (PV) system on the main concourse roof includes 221 PV panels and two inverters, with an average annual production of 49,600kWh. These solar panels help power the passenger terminal.
- South General Aviation Terminal (Appleton Flight Center) - The South General Aviation Terminal, also known as the Appleton Flight Center, is an 8,200 square foot general aviation terminal built to Leadership in Energy and Environmental Design (LEED) Platinum and Class D NetZero building standards. Sustainable features of this

[16] U.S. Department of Transportation – Federal Aviation Administration: https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC-150-5360-13A-Airport-Terminal-Planning.pdf

building include a high-performance building envelope, daylighting, a geothermal heat pump system, and a 25kW (106 panels) PV system.

- CO_2 Demand Ventilation System – The system monitors carbon dioxide (CO_2) levels in the ticketing area to determine optimum airflow rates. As passenger volume increases, the CO_2 demand ventilation system increases airflow, and vice versa. This system allows for higher efficiencies because the air handler only increases airflow, when necessary, therefore saving energy when higher airflow is not required.
- Photovoltaic Panels (Carports) – Four PV carports have been installed in the parking lot. The 460 kW four PV carport system is made up of 884 PV panels. Power from the carport system is fed into the passenger terminal to offset daily electricity needs.
- LED Upgrades – The Airport invested in various LED lighting upgrades throughout the years. Advantages of LED lights include higher efficiency, a longer lifespan, and lower maintenance and labor costs when compared to traditional lights. The upgrades resulted in higher efficiencies, with anywhere between a 30-86% reduction in energy use when compared to traditional lighting systems.
- Microgrids/Electrical Vehicle Chargers - The Airport is currently working on the installation of two microgrid systems, additional PV panels to assist in powering the microgrids, and electric vehicle (EV) chargers connected to the microgrids.
- Geothermal Test Bore – A geothermal test bore, formation thermal conductivity test, was performed to assist with determining the feasibility of a geothermal heat pump system for the passenger terminal building.

The Airport strives to pair the growth it has been experiencing with a continued commitment to sustainability.

The proposed underground portion of the geothermal system, including the vertical heat exchange field was located to be near the passenger terminal building. **Figure 2-2** provides a graphic representation of the geothermal borehole field, excess material stockpile locations, and potential haul routes for the proposed geothermal system. The proposed exterior components of the geothermal system have no aeronautical conflicts with existing or planned operations.

FAA Order 5050.4B, 706.d.(5) states that if there are no unresolved conflicts concerning alternative uses of available resources, the range of alternatives may be limited to the no action alternative and the proposed action alternative. No unresolved conflicts concerning alternative uses of available resources have been identified with the Airport location for the proposed geothermal heat exchange field. Therefore, the range of alternatives was limited to the no action alternative and the proposed action alternative.

2.2 No Action Alternative

The geothermal system would not be constructed at the proposed location with the implementation of the No Action alternative. The proposed project site would remain in its current condition. None of the improvements proposed as part of the project would occur. The land would remain unchanged, which currently consists of primarily a mowed grass field.

The No Action alternative was determined not to be a viable option since it would not satisfy the purpose of the proposed action to install an efficient heating and cooling system, which

produces fewer greenhouse gas emissions, for the passenger terminal addition and the ability to upgrade the existing passenger terminal's heating and cooling system.

While the No Action Alternative does not meet the purpose and need for the project that drives this Airport action, it does serve as a baseline for a comparison of impacts related to the Proposed Action and is retained for analysis.

2.3 Geothermal Heating and Cooling System for the Appleton International Airport Passenger Terminal Expansion Project (Proposed Action Alternative)

The proposed Airport action would construct a geothermal system to heat and cool the existing and new addition to the passenger terminal building. The proposed geothermal system would consist of a vertical closed loop heat exchange system connected to a modular heat recovery chiller (a type of water-to-water heat pump) to produce hot water and chilled water for the passenger terminal building.

Table 2-1 provides a comparison between the existing passenger terminal heating and cooling system and the proposed Airport action. When evaluating the comparison, keep in mind that the proposed Airport action includes the existing passenger terminal and the addition to the passenger terminal. The addition to the passenger terminal increases the overall passenger terminal by 66,000 ft^2.

The increased energy use for the addition to the passenger terminal would not have a significant impact on the electrical supply chain. Preliminary design estimates that 240,000 kWh/yr of electricity will be required to heat and cool the passenger terminal addition using the proposed geothermal system. This energy use would be less than if a traditional heating and cooling system, comparable to the current passenger terminal system, were used (684,000 kWh/yr equivalent electrical usage). The average Wisconsin household uses approximately 103 million BTUs/year, which is equivalent to 30,186 kWh/yr of electricity. The increased electrical needs for the for the addition to the passenger terminal would be equivalent to approximately 8 average Wisconsin households.

Table 2-1 Existing and Proposed Heating and Cooling System Comparison

	Conventional System		Proposed System		
	Existing Passenger Terminal System	**Addition to Passenger Terminal**	**Existing Passenger Terminal**	**Addition to Passenger Terminal**	**Total**
Mechanical System Type	Conventional Gas-Fired Boiler/Chiller		Geothermal Heat Pump		
Building Area	165,000 ft²	66,000 ft²	165,000 ft²	66,000 ft²	231,000 ft²
Peak Building Loads					
Heating Load	4,800 MBH	1,500 MBH	4,800 MBH	1,500 MBH	6,300 MBH
Cooling Load	3,840 MBH	1,632 MBH	3,840 MBH	1,632 MBH	5,472 MBH
Heating Energy Use	48,000 therms/yr (1,400,000 kWh/yr)^	19,000 therms/yr (560,000 kWh/yr)	450,000 kWh/yr	140,000 kWh/yr	590,000 kWh/yr
Cooling Energy Use	310,000 kWh/yr	124,000 kWh/yr	250,000 kWh/yr	100,000 kWh/yr	350,000 kWh/yr
Total Mechanical System EUI	35 kBTU/sf/yr	35 kBTU/sf/yr			14 kBTU/sf/yr
Total Mechanical System Emissions	430 MT-CO2e/yr	170 MT-CO2e/yr	330 MT-CO2e/yr	120 MT-CO2e/yr	450 MT-CO2e/yr

ft² - square feet
BTU – (British thermal unit) a BTU is defined as amount of heat required to raise the temperature of one pound of liquid water by one degree from 60° to 61°F at a constant pressure of one atmosphere
MBH – 1000 British thermal units (BTUs) per hour
Therm - a unit for quantity of heat that equals 100,000 British thermal units (BTUs)
therms/yr - estimated annual energy consumption expressed in therms of natural gas
kWh/yr – kilowatt hour per year
EUI – Energy Use Intensity
kBTU/sf/yr – 1000 BTUs per square foot per year
MT-CO2e/yr – metric tons of carbon dioxide equivalent per year
^ Basic conversion for a rough comparison of the values in the row. Current heating energy is natural gas while the proposed geothermal system would be electrically sourced and geothermal has a higher coefficient of performance (COP). The EUI provides a more accurate comparison.

The location of the proposed geothermal vertical heat exchange borehole field would be on approximately 2.6 acres of Airport property, southwest of the passenger terminal building. The borehole field would be located in a grassy area between taxiway E, taxiway A, taxiway C, and the terminal apron. **Figure 2-2** provides a graphic representation of the Proposed Action Site Detail and Appendix 1 has proposed project location photographs.

Construction of the proposed geothermal vertical heat exchange borehole field would strip off the current topsoil and remove some of the underlying clay soil to achieve design grades. Topsoil is proposed to be stockpiled for restoration of the borehole area. Preliminary design indicates there would be excess stockpiled topsoil after restoration activities. The excess topsoil would be used at other approved locations on the Airport. If an off-site county

project comes up in the future requiring topsoil, the Airport would discuss the possibility of using the stockpiled topsoil at that project with the Wisconsin Department of Natural Resources (WDNR).

Excess clay soils from the proposed geothermal vertical heat exchange borehole field and soil cuttings from the borehole drilling operations are proposed to be placed at the clay/soil cutting fill location. The clay/soil cutting fill location is near the general aviation hangers. This area would be restored to a grassy area after construction and is anticipated to be used for additional general aviation requirements including grass parking during events and additional hanger space when the need arises.

The preliminary design of the proposed vertical closed loop heat exchange system would consist of 240 vertical boreholes. The boreholes would be approximately 400 feet deep arranged in roughly a square grid pattern with 20-foot spacing between each borehole. The boreholes would be a minimum of 4.5-inches in diameter to a maximum of 6-inches in diameter. Within each borehole heat exchange piping would be placed.

The boreholes would be installed by a Wisconsin licensed heat exchange driller. The heat exchange driller would submit the Closed Loop Heat Exchange Well Application (Form 3300-255) to the WDNR. Prior to the start of drilling activities, the heat exchange driller would obtain a well notification permit from the WDNR.

Due to the expected presence of naturally occurring arsenic at the interface of the Sinnipee Group and the St. Peter Sandstone (Ancell Group) bedrock formations in the proposed borehole field, the WDNR's conditional approval would require certain construction methods and materials be used. Arsenic can be released into the groundwater at high concentrations when it is exposed to air, primarily through the well drilling process and through the lowering of the regional groundwater table. To avoid releasing arsenic into the groundwater, prior WDNR approval would be required for the borehole drilling. Borehole construction techniques would follow WDNR requirements. The type of geothermal system proposed would not extract water, therefore the system would not lower the water table.

The soil cuttings from the boreholes would not cause an arsenic hazard because although at the interface of the Sinnipee Group and the St. Peter Sandstone formations the arsenic concentrations can be relatively high, the thickness of the potential higher arsenic concentrations is relatively small. Research conducted[17] found that the mineralization zone (Sulfide Cement Horizon) consisting of arsenic-rich pyrite, marcasite, and iron oxyhydroxides is irregular shape and varies in thickness, reaching up to 2.4 meters (7.9 feet). The mineralization zone is broken down into four primary types. Arsenic concentrations in Type A are the highest layered mineralization, but the layer of Type A mineralization was only up to 20 centimeters (7.9 inches). Preliminary design of the borehole depth is approximately 400 feet.

[17] *Geologic and Geochemical Controls on Arsenic in Groundwater in Northeastern Wisconsin*, WGNHS Open-file Report 2003-01, May 8, 2003

Since the mud rotary drilling processing mixes the column of drilled material, when taken as a whole the arsenic concentrations have been calculated to be below the Wisconsin background threshold value for arsenic (8 mg/kg). The drill cuttings would also be kept on Airport property.

The proposed closed loop heat exchange system is not the type that extracts groundwater, so the Airport's proposed geothermal system would not lower the groundwater table.

The WDNR would require the boreholes be drilled using mud-rotary techniques, which seals the borehole during the drilling process. The boreholes would also be sealed with a cementitious grout product with a density of at least 15.2 lbs/gal, which is considered a more durable borehole sealant due to the physical characteristics of the Portland cement. Cementitious grouts are more resilient against breaking down, washing away, and/or settling compared to the more commonly used bentonite grout.

Drilling fluids used during the borehole drilling for lubrication, cooling, cuttings removal, and formation stability would need to meet the requirements of Wisconsin Administrative Code NR 812.151.7.

Once the borehole has been drilled, the heat exchange piping would be lowered into the borehole. The heat exchange piping would consist of two continuous 1.25-inch diameter high-density polyethylene (HDPE) pipes. The pipes are fused in the factory to a molded U-bend fitting and would be subject to a quality assurance/quality control program. The result is one continuous pipe loop within each boring. All other fittings and pipe joints would be located in the top 6-7 feet of the system.

HDPE pipe for geothermal systems typically would be certified to a national pipe standard such as ASTM D3035 and would come with a minimum 50-year warranty. HDPE pipes used for the heat exchange tubing in a geothermal system would typically also be certified to NSF/ANSI "Drinking Water Systems Components – Health Effects, to ensure that the piping does not contaminate the groundwater.

After placement of the heat exchange piping in the borehole, grout would be used to fill the space between the heat exchanger pipe and walls of the borehole. The grout mixture would meet the requirements of Section NR 812.151.9 of the Wisconsin Administrative Code.

The grout would be pumped into the borehole through a temporary tremie pipe, filling the borehole from the bottom to the surface. The entire borehole column is filled with grout that would seal the borehole and also provides thermal conductivity between the heat exchange piping and the surrounding earth.

Only WDNR approved heat exchange fluids may be used in the piping placed in the heat exchange boreholes per NR 812.151(13) of the Wisconsin Administrative Code. The heat transfer fluid that circulates through the pipes would be a 25-30% by weight of propylene glycol solution based on the preliminary design. Besides being on the WDNR's approved list for heat exchange fluids, propylene glycol has been shown to be biodegradable.

The design calculations performed on the preliminary geothermal system, which use thermal performance data measured by a test bore and building design data, show there would be an

expected long term temperature change of up to +2.1°F over the course of 25 years. This is within the typical design limit of +/- 5°F. Designing for a balanced heat extraction and heat absorption in the borehole field assists with system efficiency and maintains consistent system performance.

A well Construction Report would be completed and submitted to the WDNR within 30 days of borehole construction.

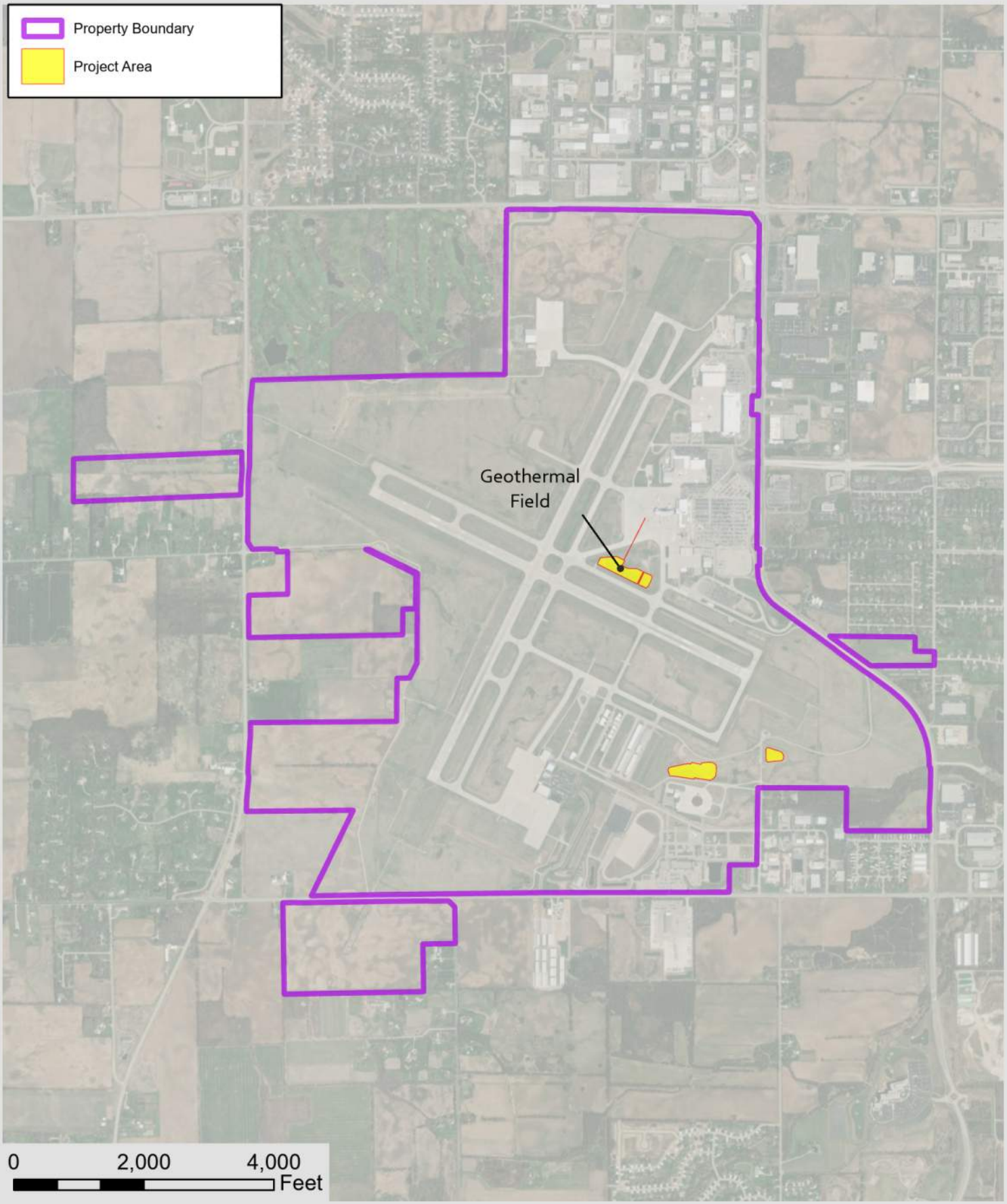
Preliminary design calls for the borehole heat exchange piping to be piped into 16 circuits of 15 bores each. The circuit headers would be piped to a central underground vault, which would manifold these circuits into a pair of 14-inch HDPE piping mains back to the building.

During the installation process a quality assurance/quality control program would be implemented. The HDPE piping is heat fusion welded. The installation firm would be required to be regularly engaged in installation of geothermal systems, have a minimum of 5-years' experience of installing geothermal systems, and installation crews must be led by an International Ground Source Heat Pump Association (IGSHPA) certified individual for heat fusion pipe joining techniques. The individual vertical borehole piping, the lateral circuit and main piping, and the system as a whole would undergo documented pressure testing of at least 90 psi with not more than 4 psi of pressure loss for at least 4 hours. All joints would be tested, and most would be tested 2-3 separate times. Piping materials and testing procedures would written into the construction specifications and witnessed by independent project representatives and the design engineer. System test results would also be required to be submitted for review by the Engineer of Record.

If a leak would occur, the system would slowly depressurize and would alert the building operator that there is an issue. The location of the leak within the system can be determined by isolating segments of the system and monitoring the pressure at test ports provided in the building and/or at the underground manifold vault. In the occasions where the leak is underground and is not evident at the surface, ultrasonic detection methods can be employed to locate the leak. Locating tracer wire would be included above all lateral piping for additional ease of locating piping in the future.

The Proposed Action alternative would not change flight paths for the Airport or cause air space or procedural changes. **Figure 2-2** provides a graphic representation of the Proposed Action site detail map.

The Proposed Action alternative, if built, is expected to cost approximately $4.5 million. The project costs include construction of the vertical heat exchange field and associated piping to the passenger terminal building, professional services, permits, review fees, and contingencies. The funding for the project would come from an infrastructure grant, State funding and Sponsor funding. If built, construction is projected to begin in late summer of 2024 with substantial completion and functional use in 2025.



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1 Systems Drive
Appleton, WI 54914
(920) 735-6900
www.westwoodps.com

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GEOTHERMAL ENVIRONMENTAL ASSESSMENT

PROPOSED GEOTHERMAL SYSTEM LOCATION

APPLETON INTERNATIONAL AIRPORT
VILLAGE OF GREENVILLE, OUTAGAMIE COUNTY, WISCONSIN

Project Manager:		SCALE: 1 in = 2,000 ft
Project Engineer:		
Drawn By:	JCW	PROJECT NO. **R3001381.00**
Checked By:	BDW	
Date:	1/31/2024	FIGURE NO. **2-1**

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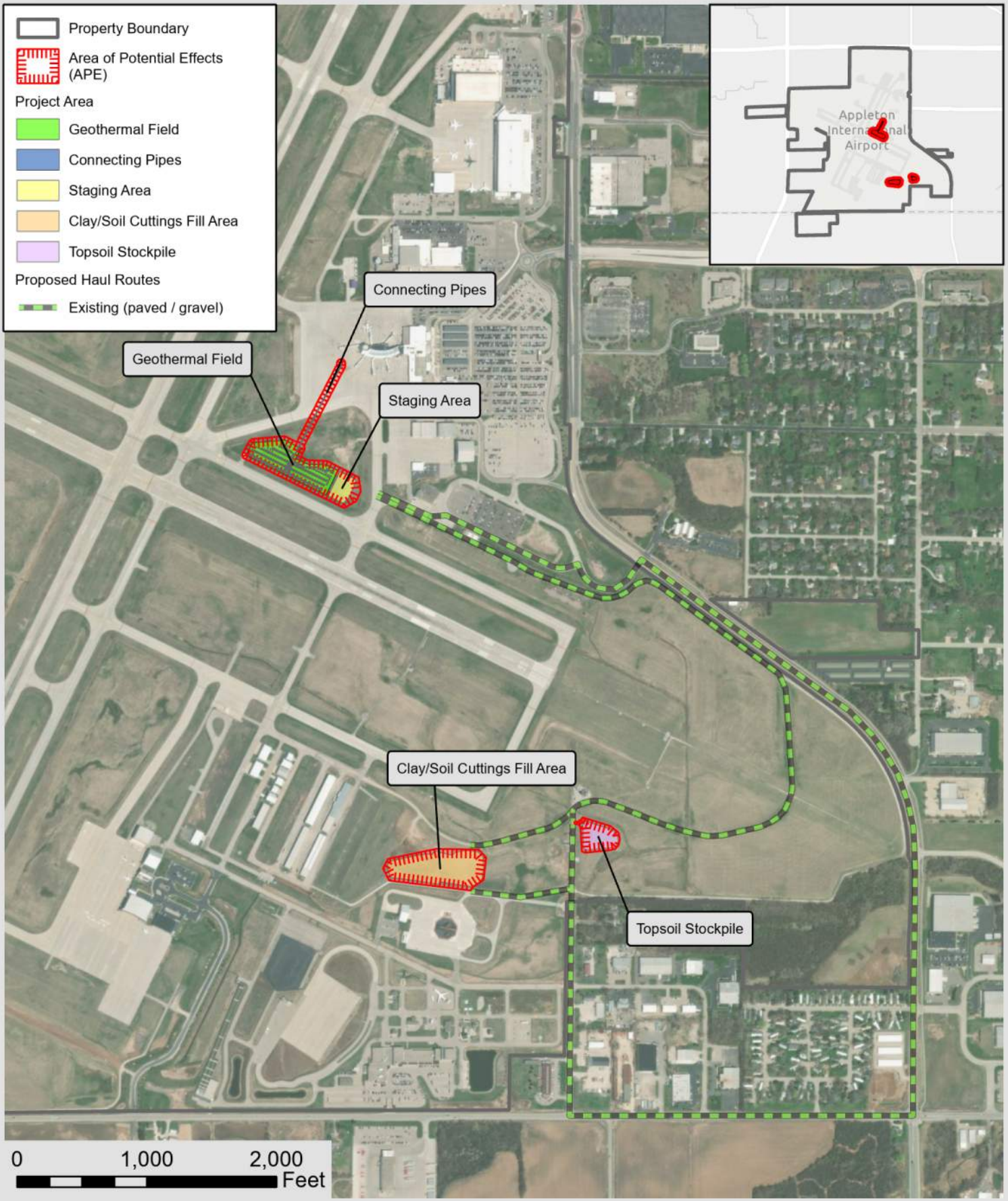

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N W E S

GEOTHERMAL ENVIRONMENTAL ASSESSMENT

PROPOSED ACTION SITE DETAIL MAP

APPLETON INTERNATIONAL AIRPORT
VILLAGE OF GREENVILLE, OUTAGAMIE COUNTY, WISCONSIN

Project Manager:		SCALE: 1 in = 1,000 ft
Project Engineer:		
Drawn By:	JCW	PROJECT NO. **R3001381.00**
Checked By:	BDW	
Date:	1/31/2024	FIGURE NO. **2-2**

F:\TR\JOBS\E2422A21 ATW Terminal Apron\Environmental\2023 Geothermal EA\GIS\EnvAssessmentMaps.aprx [Proposed Action Site Detail Map]
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CHAPTER 3 - AFFECTED ENVIRONMENT

This chapter provides a background of the existing affected environment of the proposed project area. The potential environmental impacts of the Proposed Action are evaluated in Chapter 4, Environmental Consequences - Specific Impact Categories.

3.1 Location

The Airport is located at W6390 Challenger Drive, Appleton, Wisconsin in the NE ¼, SW¼, Section 25, T21N, R16E, Village of Greenville, Outagamie County, Wisconsin. The Airport is located approximately five miles west of downtown Appleton, 35 miles south-southwest of Green Bay and 107 miles north-northwest of Milwaukee. The Airport coordinates are latitude N44° 15' 28" and longitude W88° 31' 7". **Figure 3-1** provides a graphic representation of the Airport's location.

The proposed project site for the vertical geothermal borehole field would be located on approximately 2.6 acres of Airport land. The proposed geothermal borehole field would be located in a grassy area between taxiway E, taxiway A, taxiway C, and the terminal apron. The proposed topsoil stockpile location and the proposed clay/soil cutting fill location would be located on the southeast side of the Airport, just north and northeast of the aircraft rescue and firefighting (ARFF) training facility. The proposed topsoil stockpile location and the proposed clay/soil cutting fill location would be located on approximately 1.1 and 3.6 acres, respectively, of Airport land. **Figure 3-2** shows the Airport property boundary, the proposed project areas on the Airport, and surrounding properties.

3.2 Airport Facilities

Outagamie County owns approximately 1795 acres for airport use. In addition, the Airport controls 29 acres of land through purchase of aviation easements and 9.7 acres through a clear zone easement.

The Airport has two concrete runways with full length parallel taxiways. Runway 3/21 is 8002 feet long and 150 feet wide. Runway 12/30 is 6501 feet long and 150 feet wide. Runway 3/21 is considered the primary runway due to its longer length, greater number of instrument approach procedures, and wind coverage. **Table 3-1** lists runway characteristics, including length, width, lighting, and visual glide slope indicator types.

Table 3-1 Runway Characteristics

Runway	Length x Width	Lighting	Visual Glide Slope Indicator	Approach Procedures
3	8,002' x 150'	MALSR, HIRL	PAPI	ILS,NDB, RNAV(GPS)
21		REIL, HIRL		VOR/DME, RNAV(GPS)
12	6,501' x 150'	REIL, HIRL	PAPI	VOR/DME, RNAV(GPS)
30		MALSR, HIRL	PAPI	ILS, NDB, RNAV(GPS)

HIRL: High Intensity Runway Lights
ILS: Instrument Landing System
MALSR: Medium Intensity Approach Lighting System With Runway Alignment Indicator Lights
NDB: Non-Directional Beacon
PAPI: Precision Approach Path Indicator
REIL: Runway End Identifier Lights
RNAV(GPS): Random Navigation - Global Positioning System
VASI: Visual Approach Slope Indicators
VOR/DME: VHF Omni-Directional Radio Range /Distance Measuring Equipment

The airport also is served by an air traffic control tower (ATCT). The ATCT is located directly south of the terminal building. The Airport's ATCT is managed and staffed under the FAA contract control tower program.

The Airport has an extensive taxiway system, which supports aircraft operations. **Table 3-2** lists taxiway designations and functions. The airport diagram published by the FAA is presented in **Figure 3-3**, which shows the taxiways in relationship to the runways.

Table 3-2 Taxiway Function

Designation	Function
A	Northern full-length parallel taxiway for Runway 12/30
A1-A4	Connector taxiways between Runway 12/30 and Taxiway A
B	Eastern full-length parallel taxiway for Runway 3/21
B1-B6	Connector taxiways between Runway 3/21 and Taxiway B
C	Connects Taxiways A & B to south end of the air carrier apron
D	Connects Taxiway B to the north end of the air carrier apron
E	Connects Taxiway A to the south end of the air carrier apron
G	Connects Taxiway B to the northeast corporate hangar area
H	Connects Taxiway B to Federal Express air cargo facilities
J	Connects Runway 3/21 to northwest air cargo area
K	Connects Runway 12/30 to compass calibration pad
M	Provides circulation for south general aviation hangars
N	Connects Taxiway B to south general aviation hangar area
N3-N4	Connects Runway 12/30 with south general aviation hangar area
P	Connects Taxiways B & N to south general aviation ramp

The Airport is served by four air carriers; Allegiant, American Airlines, Delta, and United Airlines. There were 416,390[18] passenger boarding (enplanements) and 40,877[19] operations (take-offs or landings) in 2022.

In addition to the air carriers, the Airport has several tenants. Gulfstream Aerospace produces several models of aircraft primarily for corporate use. Gulfstream has regional maintenance, repair and overhaul facilities and paint shop facilities housed in six large hangars at the Airport. Air Wisconsin Airlines Corporation has their corporate headquarters located at the Airport. Air Wisconsin Airlines performs flying services for American Airlines operating as American Eagle throughout the Midwest and East Coast. The Airport currently has one air cargo operation; Federal Express, which provides overnight, next day, and freight service. Fox Valley Technical College's Public Safety Training Center combines classroom training with hands-on practice in a real-world setting for students and public safety professionals. The Public Safety Training Center is located at the south end of the Airport property. The Fox Valley Technical College also operates the ARFF training facility.

[18]https://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/passenger/cy22_commercial_service_enplanements

[19] https://aspm.faa.gov/opsnet/sys/Airport.asp

Appleton Flight Center is the fixed based operator (FBO) for the Airport. NewView Technologies provides aircraft maintenance. Pilotsmith offers flight training. Maxair provides aircraft charter services. **Figure 3-4** shows the Airport property boundary, the proposed project areas on the Airport, and some of the main Airport locations.

The Airport's air carrier terminal is located on the east side of the Airport and can be accessed from County Highway CB. There is automobile parking available immediately east of the terminal building. Ground transportation services are also provided at the terminal facility.

General Aviation (GA) is generally defined as that portion of civil aviation, which encompasses all facets of aviation except commercial and military operations. The GA area at the Airport consists of GA terminal building, aircraft storage buildings, aircraft parking areas, aircraft maintenance facilities, separate fueling area, vehicular access roads, connector taxiway, and pilot facility. The GA area is located on the southern end of the Airport.

Airport support facilities include a public safety building, which houses aircraft rescue and firefighting equipment and staff, airport maintenance and snow removal building, deicing mix and loading building, and a fuel storage facility.

3.3 Geology and Bedrock

The Airport is located in the Fox-Wolf River basin of Wisconsin. Surficial deposits in this basin consist of glacial sediment deposited during the Wisconsin glaciation. The glaciers were present during the Pleistocene period. United States Geological Survey maps[20] indicate that the materials in the vicinity of the Airport are composed of glacial lake deposits consisting mainly of silt and clay. The site overlies bedrock formed during the Ordovician Period and bedrock in this area is comprised of the undifferentiated Platteville Formation, Decorah Formation, and Galena Dolomite.

A geotechnical investigation[21] was performed on January 21 – February 2, 2022, to investigate subgrade soils in the areas of the proposed passenger terminal expansion and proposed terminal apron expansion. In general, the subsurface profile consisted of either topsoil in the proposed apron pavement expansion areas or an existing apron pavement section in the proposed terminal building expansion area followed by native lean clay glacial till soils. Topsoil depths ranged from 0.2 to 3.0 feet, although the majority of the topsoil thicknesses were 0.5 feet. The topsoil consisted of dark brown lean clay with organics in a moist condition. Native glacial till consisted of lean clay with a varying amount of sand and gravel. The sand within the clay was generally coarse and the gravel size ranged from ¼-inch to over 1 inch. The native clay was in a moist condition and transitioned in color from reddish brown to brown at depths ranging from 4 to 13 feet. The consistency of the native clays was generally stiff to very stiff. Soil borings in the proposed apron area went down to 10 feet

[20] Water Resources of Wisconsin, Fox-Wolf River Basin, by Perry G. Olcott, 1968

[21] Geotechnical Exploration Program, Terminal Apron and Building Expansion at ATW, prepared by Westwood, dated March 2022.

below ground surface (fbgs). Soil borings in the proposed passenger terminal expansion area went down to 30 ft fbgs.

A test bore in the area of the proposed geothermal borehole field was performed on January 17-19, 2022, to investigate the formation thermal conductivity[22]. The test boring was advanced to 440 fbgs. **Table 3-3** is the formation descriptions from the test borehole.

Table 3-3 Test Bore Drill Log

Formation Description*	Depth (ft)
Clay gravel stringers	0 - 20
Clay gravels limestone	20 - 40
Hard limestone	40 - 50
Fractured limestone with gravel	50 - 60
Hard limestone with dolomite	60 - 90
Sandstone	90 - 190
Limestone / sandstone	190 - 370
Sandstone / shale, fine sands	370 - 390
Sandstone with cavern	390 - 410
Sandstone with shale, fine sands	410 - 430
Sandstone / limestone / fine sands	430 - 440
*Descriptions taken from drill log found in the Formation Thermal Conductivity Test & Data Analysis report.	

3.4 Topography and Drainage

The Airport topography generally slopes downhill from the northwest to the southeast. Elevations vary from approximately 930 feet to 800 feet above mean sea level (MSL). Natural slopes on the Airport range from 0.5% to 5%. The established Airport elevation, defined by the FAA as the highest point on any paved landing surface, is 918 feet MSL. This elevation occurs near runway End 12. **Figure 3-5** is an aerial view of the proposed project area with a topographic map overlay.

Stormwater is controlled by topography, piping, and rights-of-way ditches. Depending on the location on the Airport, stormwater can flow to the north, south, east, west, or southeast. By volume, most of the stormwater flows to the southeast for approximately 2.5 miles until it joins Mud Creek. Mud Creek flows approximately 0.5 miles before entering the Fox River, immediately north of Little Lake Butte des Morts. Stormwater on the proposed project site consists of topography sheet flow, which eventually is picked up by drainage swales and rights-of-way ditches.

[22] Formation Thermal Conductivity Test & Data Analysis, prepared by G.O. Loop, LLC, January 28, 2022.

3.5 Soils

According to the United States Department of Agriculture Soil Survey of Outagamie County[23], the surficial soils at the Airport are primarily classified as Udorthents. The proposed geothermal well field would be located in soils classified as Udorthents. **Figure 3-6** is an aerial view of the proposed project areas with a soil map overlay.

Udorthents soil types are well drained, nearly level in filled and smoothed areas where fill varies, but is mainly loamy and clayey.

3.6 Surface Water

There are no surface waters on the proposed geothermal well field location. There is an intermittent stream surrounding the proposed location. This stream drains Airport property and collects stormwater runoff from the impermeable surfaces in the area. Small intermittent streams in and around the Airport connect to Mud Creek. Mud Creek flows approximately 0.5 miles before entering the Fox River, immediately north of Little Lake Butte des Morts. **Figure 3-7** is an aerial view of the proposed project areas with designated resource waters map layer overlaid.

3.7 Wetlands and Floodplains

Wetland delineations were performed in and adjacent to the proposed topsoil stockpile location and the proposed clay/soil cutting fill location. A wetland delineation was performed in October 2016, as part of the ARFF training facility project. The delineation identified 2.57 acres of wetlands, but no wetlands were identified in the footprint of the proposed clay/soil cutting fill location. A copy of the wetland delineation report was provided to the United States Army Corps of Engineers and the WDNR[24]. A meeting between OMNNI's[25] wetland delineator and the WDNR took place at the Airport on May 17, 2017, to review the ARFF wetland delineation. The WDNR concurred with the lines of the wetland delineation.

A second wetland delineation was performed in October of 2021 as part of the East Service Road project[26]. This delineation was adjacent to both the proposed topsoil stockpile location and the proposed clay/soil cutting fill location. The delineation identified 0.280 acre of wetland, but no wetlands were identified in the footprint of the proposed topsoil stockpile location or the proposed clay/soil cutting fill location. A copy of the wetland delineation

[23] Soil Survey of Outagamie County, Wisconsin, USDA-SCS and the University of Wisconsin, November 1978.

[24] Wetland Delineation Report, Appleton International Airport, Live Burn Facility, dated November 16, 2016, prepared by OMNNI Associates, Inc.

[25] Westwood Professional Services, Inc. acquired OMNNI Associates in 2019.

[26] Wetland Delineation Report, East Service Road, dated January 20, 2022, prepared by Westwood Infrastructure, Inc.

report was provided to the United States Army Corps of Engineers and the WDNR. The WDNR sent the concurrence letter on February 15, 2022.

A third wetland delineation was performed in October 2022, which included the footprint area of the proposed topsoil stockpile location. The delineation identified 1.375 acres of wetlands, but no wetlands were identified in the footprint of the proposed topsoil stockpile location. A copy of the wetland delineation report[27] was provided to the United States Army Corps of Engineers and the WDNR.

The proposed geothermal borehole field location area near the passenger terminal was field assessed for wetlands on October 13, 2021, as part of the Concourse and Terminal Expansion project. No wetlands were found during the field assessment. No wetland or wetland indicators were identified on Surface Water Data Viewer or National Wetlands Inventory.

The proposed topsoil stockpile location and the proposed clay/soil cutting fill location do not impact any of the wetlands delineated. No wetlands were found within the proposed geothermal borehole field location. **Figure 3-8** shows the delineated wetlands near the proposed project areas.

Flood insurance rate maps prepared by the Federal Emergency Management Agency (FEMA) determine the limits of base floodplains (100-year flood areas). Flood insurance rate maps were reviewed to determine the limits of base floodplains in relation to the proposed project areas. As shown in **Figure 3-9** the proposed project areas are not shaded, which indicates the areas are classified as Zone X. FEMA has defined flood Zone X as areas of minimal flood hazard, usually depicted on flood insurance rate maps as above the 500-year flood level.

3.8 Groundwater

Monitoring wells were installed near a former underground storage tank facility that was located in the northeast area of the Airport. Groundwater elevations associated with that underground storage tank investigation were recorded between 2.0 and 4.5 ft below ground surface. Groundwater flow direction in the area was determined to be to the south. Monitoring wells were also installed near a former underground storage tank facility that was located southeast of the air carrier terminal. Depth to groundwater at this location was recorded between 2.3 and 8.2 ft below ground surface. Groundwater flow direction in this area was determined to be to the west. Localized groundwater flow direction can be influenced by underground utilities, underground structures, fill materials, and soil conditions. Regionally, groundwater flow direction is expected to be in an east-southeasterly direction towards the Fox River. A Village of Greenville municipal supply well is located along the east edge of the Airport.

3.9 Climate

The climate at the Airport is typical of Wisconsin. Winters can be long, cold, and snowy; summers are warm and occasionally humid; and spring and fall are transitional seasons with

[27] Wetland Delineation Report, Appleton International Airport, Waste Areas, dated November 28, 2022, prepared by Westwood Infrastructure, Inc.

varying weather conditions. Temperature extremes vary from a July average high of 82°F to a January average low of 10°F. The average annual rainfall is 33 inches. The average annual snowfall is 49 inches. The average first frost is between October 1st – 10th and the average last frost occurs between May 1st - 10th[28].

Climate change can have local impacts such as warmer air temperatures, sea level rise, increase storm activity, and increased intensity during precipitation events[29]. There are currently no climate resiliency infrastructures located within the proposed project areas. The project areas are mowed grass fields and disturbed areas that are not located adjacent to a waterbody.

The Airport has been incorporating various sustainable initiatives to reduce GHGs. Section 2.1, Background, provides a listing of some of the sustainable initiatives.

3.10 Air

Outagamie County is designated as in attainment for Clean Air Act's National Ambient Air Quality Standards (NAAQS)[30]. The NAAQS are health standards for carbon monoxide, lead, nitrogen dioxide, 8-hour ozone, particulate matter (PM-10 and PM-2.5), and sulfur dioxide. **Figure 3-10** shows the NAAQS nonattainment areas in relationship to the proposed project site. The WDNR operates two air quality monitoring stations in Outagamie County[31]. The Appleton monitoring station is located at 4579 N. Meade Street and the Kaukauna monitoring station is located at 601 Plank Road[32]. The Appleton station includes monitors that measure ozone and fine particulate matter concentration in outdoor air (particulate matter 2.5 micron or smaller in size). The Kaukauna station has a sulfur dioxide monitor and collects meteorological data.

3.11 Biotic Communities

Biotic communities consist of all organisms (flora and fauna) living on and contributing to a specific region. Flora is the plant life characteristic of a particular geographic area. Fauna is the grouping of animals present in a particular geographic area.

[28] https://www.weather.gov/wrh/climate?wfo=grb

[29] https://www.faa.gov/sites/faa.gov/files/about/office_org/headquarters_offices/apl/3-climate.pdf

[30] County-Level Multi-Pollutant Information: https://www.epa.gov/green-book/green-book-national-area-and-county-level-multi-pollutant-information.

[31] The Air Quality System (AQS) site identification numbers are 55-087-0009 and 55-087-0015.

[32] Wisconsin WDNR 2024 Air Monitoring Network Plan: https://dnr.wisconsin.gov/sites/default/files/topic/AirQuality/FInal2024AnnualNetworkPlan.pdf

The Airport is located in the Greenville Moraines land type association[33] of the Central Lake Michigan Coastal ecological landscape[34]. The Airport is also located within the tension zone. The tension zone (transition zone) divides the state into two floristic provinces, the prairie-forest province to the southwest and the northern hardwoods province to the northeast. **Figure 3-11** shows the ecological landscapes and land type association in relationship to the proposed project site. The Airport location historically contained deciduous forest that included Sugar Maple, Basswood, Red Oak, White Oak, and Black Oak.

Many of these forested areas have been disturbed by previous human activities, including the Airport property. Most areas on the Airport are mowed to control trees and shrub species from colonizing. Trees are normally not allowed to grow to substantial heights on airport property in order to keep aircraft approach surfaces and safety zones clear and to prevent concentrations of wildlife that could be hazardous to aircraft operations. The adjacent properties to the Airport, which are not mowed, are cultivated, or landscaped for commercial businesses or residential properties.

Wildlife observed near the Airport include white-tailed deer, squirrels, foxes, coyotes, skunks, groundhogs, cottontail rabbits, small rodents, hawks, turkey and other birds. A perimeter fence surrounds the Airport. One of the purposes of the perimeter fence is to limit wildlife entering air operations area. Wildlife observed in the proposed project areas are occasional transient birds. Wildlife is discouraged from being in the air operation areas for safety reasons.

The U.S. Fish & Wildlife Services (USFWS) Information for Planning and Consultation (IPaC) tool was accessed. The project area was input and a list of threatened and endangered species that may occur in the proposed project location or may be affected by the proposed project was generated. The federal list for endangered, threatened, or candidate species includes the following: Northern Long-eared Bat, Tricolored Bat, Whooping Crane, and Monarch Butterfly. For all these species, there are no critical habitats found in or near the project area. **Figure 3-12** shows that there are no critical habitats within the mapped extents based on the U.S. Fish & Wildlife species active critical habitat GIS mapping.

A Natural Heritage Inventory (NHI) review conducted by the WDNR was completed for the project area. The review identified no known state listed threatened or endangered species or suitable habitats that could be impacted by the project. The results of the NHI review were included in the DNR Initial Review letter included in Appendix 2.

[33] Wisconsin Ecological Landscapes Handbook: https://dnr.wisconsin.gov/topic/Lands/Book.html#:~:text=%22The%20Ecological%20Landscapes%20of%20Wisconsin,from%20an%20ecosystem%20management%20perspective.

[34] Wisconsin Department of Natural Resources. 2015. The ecological landscapes of Wisconsin: an assessment of ecological resources and a guide to planning sustainable management. Chapter 8, Central Lake Michigan Coastal Ecological Landscape. Wisconsin Department of Natural Resources, PUB-SS-1131J 2015, Madison.

Both the USFWS IPaC tool and WDNR NHI review did not indicate there are any federally or state listed endangered species in the project area.

3.12 Land Use

The Airport owns the land being considered for the proposed geothermal borehole field, topsoil stockpile location, and clay/soil cutting fill location.

The proposed geothermal borehole field is currently a mowed grass field (with the exception of areas that are disturbed from the terminal apron expansion project) with no structures on it. Prior to the development of the Airport, a farmstead existed at the proposed geothermal borehole field location. The farmstead is shown on aerial mapping from the Agricultural Stabilization and Conservation Service's (ASCS) 1938, 1941, and 1950 maps, and the United States Geological Survey (USGS) Service's 1956 map. Based on aerial photography, the farmstead was razed between 1956 and 1964. Remnants of a building foundation remain. Based on aerial photography, the outline of the building foundation is roughly in the same area as the former farmstead. An architectural history reconnaissance survey[35] was performed that included the area of the proposed geothermal borehole field during the apron and passenger terminal expansion projects. The architecture/history survey found no Listed, Eligible, or Potentially Eligible Historic District(s) in the project area. The remnants of the building foundation are considered old construction debris and would be removed during construction of the geothermal borehole field.

The proposed topsoil stockpile and clay/soil cutting fill locations are currently disturbed areas with no structures. Aerial mapping from ASCS and USGS show the topsoil stockpile and clay/soil cutting fill locations as farm fields prior to the development of the Airport.

As part of the Outagamie County comprehensive planning process maps were developed for existing and future land use. These maps are periodically updated and can be found on the Outagamie County comprehensive plan website[36]. Winnebago County GIS information was also obtained to show the existing and future land use south of West Prospect Avenue (County Highway BB). The existing land use map identifies the proposed geothermal borehole field area as Air Transportation and the proposed topsoil stockpile and clay/soil cutting fill locations as Crop Production. **Figure 3-13** shows the existing mapped land use for the area surrounding the Airport. **Figure 3-14** shows the planned future land use for the area surrounding the Airport.

[35] WisDOT ID 39507565011 (Project ID 0744-42-55, 0744-40-57, and 0744-40-92)–Appleton International Airport Apron Concourse and Expansion Project, Outagamie County, Wisconsin, Sara Nelson, Architectural Historian, Westwood Professional Services, Inc., dated 6/24/2021

[36] http://www.outagamie.org/government/departments-a-e/development-and-land-services/comprehensive-plan

3.13 Zoning

The majority of the Airport, including the proposed project areas, is zoned Airport District[37] as shown in **Figure 3-15**. Air operations zoning is shown in **Figure 3-16**. The different zones on the Airport Zoning Map indicate different regulations primarily for areas of permitted uses and structures. Detailed descriptions of allowed permitted uses within each zone can be found in the Outagamie County, Wisconsin Code of Ordinance, Chapter 10 – Aviation, Article III – Airport Zoning, Division 2. – Districts and District Regulations[38]. In general terms, Zone 1 is the most restrictive and Zone 3 is the least restrictive. Zone 1 is primarily limited to uses and structures that are necessary for Airport operations. Zone 2 encourages land uses compatible with Airport operations. Zone 3 is to permit the uses of land in a manner consistent with the present and future use and operation of the Airport.

3.14 Socioeconomic Data

There were 12,687 people and 4,478 households residing in the Village of Greenville[39] as of the 2020 census[40]. When compared to the 2010 census data, the village's population increased by 23.1%. **Table 3-4** shows the population change from 1980 to 2020 for the village, county and state.

Table 3-4 Population Change, 1980 to 2020

	1980	1990	2000	2010	2020
Village of Greenville	3,310	3,806	6,844	10,309	12,687
Outagamie County	128,730	140,510	161,091	176,695	190,705
State of Wisconsin	4,705,642	4,891,769	5,363,715	5,686,986	5,893,718

The distribution of people by demographic background for the Village of Greenville is similar to that of Outagamie County. When the demographic background composition of the village is compared to the state, there is more of a difference. The state population of African Americans is 6.4%; the town is 0.6%. The state population of Asians is 3.0%; the village is 1.5%.

[37] Outagamie County GIS data download page: Airport Zoning – This feature class was derived off of the 1990 Zoning Ordinance Z-16-90. This ordinance covers airport property, the airport industrial park and the airport overlay districts. Zone 3A was created in March of 2012.

[38] Outagamie County, Wisconsin, Code of Ordinances: https://library.municode.com/wi/outagamie_county/codes/code_of_ordinances?nodeId=COOR_CH10AV_ARTIIIAIZO_DIV2DIDIRE

[39] Through a referendum, the Town of Greenville was partial incorporation in November 2020. The eastern half of the community incorporated as a village in January 2021, and annexed the remnant western half of the original township in June 2021.

[40] https://www.census.gov/data/tables/2023/dec/2020-census-demographic-profile.html.

Table 3-5 shows the demographic background population composition for the town, county, and state.

Table 3-5 2020 Census Data - Racial Composition

Demographic Background	Village of Greenville	Outagamie County	State of Wisconsin
White	91.9%	86.0%	80.4%
Black or African American	0.6%	1.6%	6.4%
Native American and Alaska Native	0.4%	1.6%	1.0%
Asian	1.5%	3.5%	3.0%
Native Hawaiian and Other Pacific Islander	0%	0.1%	0%
Some Other Races	1.8%	2.0%	3.1%
Two or More Races	3.9%	5.3%	6.1%

The distribution of people by ethnicity for the Village of Greenville is approximately the same percentages as that of Outagamie County. When the ethnicity composition of the village is compared to the state, there is a more of a difference. The state population of Hispanic or Latino Americans is 7.6%; the village is 4.1%. **Table 3-6** shows the ethnicity population composition for the city, county, and state.

Table 3-6 2020 Census Data - Ethnicity Composition

Ethnicity Composition	Village of Greenville	Outagamie County	State of Wisconsin
Hispanic or Latino	4.1%	4.9%	7.6%
Non-Hispanic or Latino	95.9%	95.1%	92.4%

3.15 Historical, Architectural, Archeological, and Cultural Resources

Reviews were conducted within the area of potential effects (APE)[41] to determine if any properties were in, or eligible for inclusion in, the Nation Register of Historic Places. **Figure 3-17** shows the Area of Potential Effects.

[41] An area of potential effects (APE) is defined by 36 CFR 800.16 as being "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist."

In 2003[42] and 2021[43] Phase I Archaeological Reconnaissance Surveys were conducted at the Airport that included the areas of the proposed project. **Figure 3-18** shows the proposed project areas on the Airport and the archaeological and historic property study areas performed on and adjacent to the Airport. There are no known archaeological sites in the proposed project area and no new archaeological sites were found.

In 2021[44] a Phase I Architectural Historic Reconnaissance Survey was conducted at the Airport that included the areas of the proposed project. No Adverse Effects to historic properties was the conclusion of the survey.

Preliminary coordination letters[45] were sent out to Native American tribes to familiarize them with the proposed passenger terminal and apron expansions and to solicit their interest and concerns regarding historical, archeological, and cultural resources. Native American preliminary coordination letters are included in Appendix 2.

A preliminary coordination letter was sent out to the Outagamie County Historical Society to familiarize them with the proposed passenger terminal and apron expansions and to solicit their interest and concerns regarding historical, architectural, archeological, and cultural resources. The Outagamie County Historical Society preliminary coordination letter is included in Appendix 2.

The above investigations were submitted to the State Historic Preservation Officer (SHPO). The SHPO concurred that there are no properties listed in or eligible for the National Register of Historic Places within the APE for the proposed project.

[42] Phase I Archaeological Survey of Outagamie County Regional Airport (AIP-26), AVD Archaeological Services, Inc., May 7, 2003.

[43] Phase I Archaeological Reconnaissance Survey, Appleton International Airport (ATW) Apron and Concourse Expansion Project, OMNNI Associates, A Westwood Company, April 29, 2021.

[44] Phase I Architectural History Reconnaissance Survey, Appleton International Airport (ATW) Apron and Concourse Expansion Project, OMNNI Associates, A Westwood Company, April 29, 2021.

[45] Footnote added: Preliminary coordination letters were sent out to Native American Tribes during the CatEx for the Apron/Passenger Terminal Expansion project, which included the geothermal borehole field. The CatEx did not include the proposed topsoil stockpile location or the proposed clay/soil cutting fill location; however, these areas were included in Archaeological Reconnaissance Surveys and Architectural Historic Reconnaissance Surveys. Discussions took place between WisDOT Bureau of Aeronautics staff and Cultural Resources staff. WisDOT-Cultural Resources staff did not identify additional Native American Tribe correspondence as a necessary step in the process since the APE was covered. A determination was made that no eligible properties are within the APE. The WisDOT Bureau of Aeronautics, WisDOT Cultural Resources, and SHPO correspondences are included in Appendix 4.

3.16 Economic Environment

The Fox Cities has a diversified economic base and workforce. Comprised of 23 municipalities and a population of over 258,000[46], the Fox Cities is one of the largest and fastest growing urban centers in Wisconsin. Historically, industry grew up along the banks of the Fox River: paper making, printing, and manufacturing. Today, the economic base of the Fox Cities also includes finance, insurance, service, and health care. Major employers in the area include: Thedacare, Affinity Health System, Kimberly-Clark Corporation, Thrivent Financial, Presto Products, Plexus, Bemis Company, Faith Technologies, Miller Electric, Pierce Manufacturing, and Bergstrom Corporation[47].

The 2022 American Community Survey[48] estimates the educational attainment for the Village of Greenville to be higher for high school graduation when compared to Outagamie County or the state. The Village of Greenville has a higher percentage of individuals with a bachelor's degree or higher when compared to Outagamie County or the state. **Table 3-7** shows the estimated 2022 educational attainment between the town, county, and state.

Table 3-7 2022 Education Attainment

	High School or Equivalent	Bachelor's Degree or Higher
Village of Greenville	98.1%	41.2%
Outagamie County	94.9%	35.9%
State of Wisconsin	93.6%	33.2%

The 2022 American Community Survey estimates[49] the median household income in the Village of Greenville to be $104,413. The per capita income for the village is estimated to be $45,394 which was more than the county per capita income ($41,061) and the state per capita income ($40,188). **Table 3-8** shows the per capita change from 2000 to 2022 for the village, county and state.

Table 3-8 Per Capita Income Change

	2000	2010	2015	2022
Village of Greenville	$22,164	$30,409	$34,369	$45,394
Outagamie County	$21,943	$26,965	$28,679	$42,923
State of Wisconsin	$21,271	$26,624	$28,340	$40,130

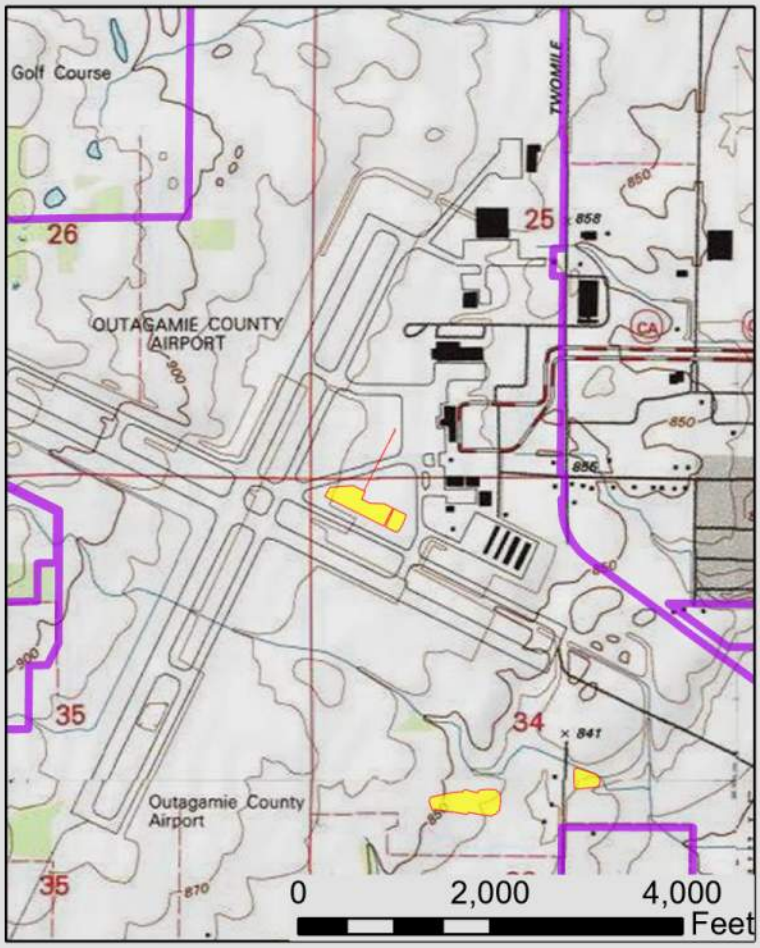
[46] https://ecwrpc.org/maps/Appleton_MPO_Planning_Boundary_2023.pdf

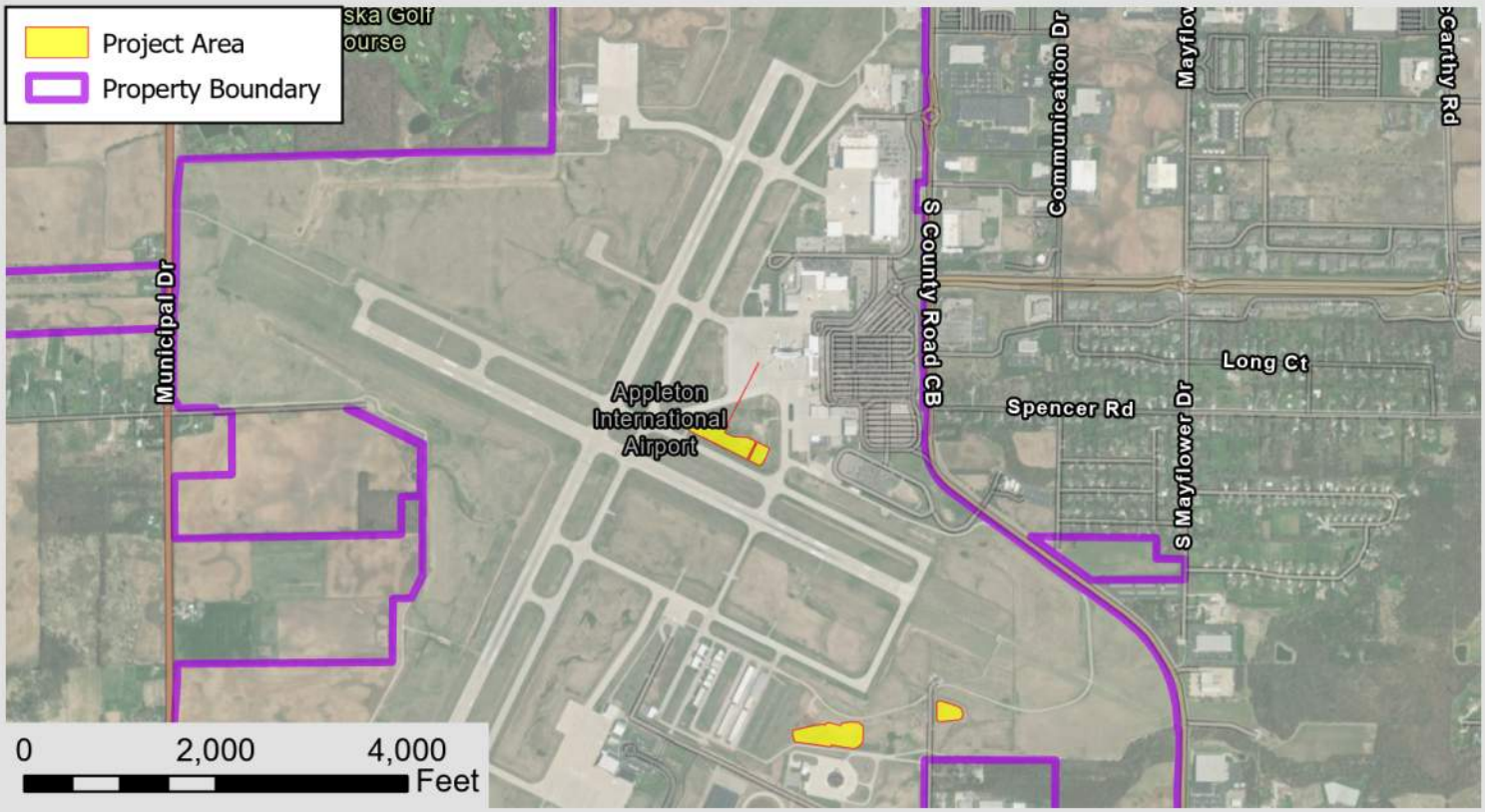
[47] *https://foxcitiesregion.com/*

[48] https://data.census.gov/profile/Greenville_village,_Wisconsin?g=160XX00US5531525

[49] Income in the past 12 months (in 2022 inflation-adjusted dollars)

According to the 2018-2022 American Community Survey estimates, for 2022, the percent of people below the poverty level in the past 12 months for the Village of Greenville was 2.4%, which was lower than either Outagamie County (7.3%) or the State of Wisconsin (10.7%).





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GEOTHERMAL ENVIRONMENTAL ASSESSMENT

LOCATION MAP

APPLETON INTERNATIONAL AIRPORT
VILLAGE OF GREENVILLE, OUTAGAMIE COUNTY, WISCONSIN

Project Manager:		SCALE: 1 in = 2,000 ft
Project Engineer:		
Drawn By:	JCW	PROJECT NO. R3001381.00
Checked By:	BDW	
Date:	1/31/2024	FIGURE NO. 3-1

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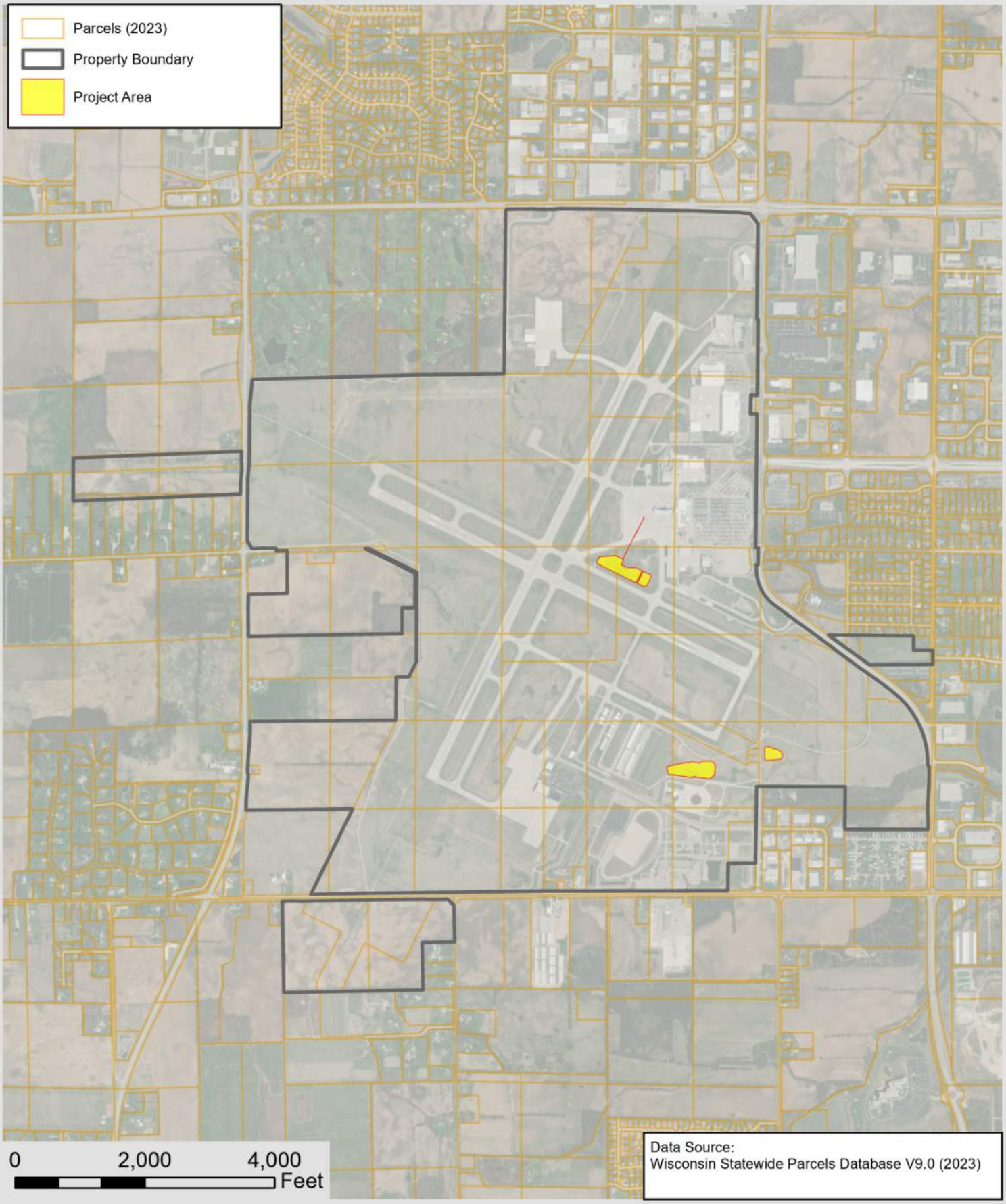

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AIRPORT PROPERTY MAP

APPLETON INTERNATIONAL AIRPORT
VILLAGE OF GREENVILLE, OUTAGAMIE COUNTY, WISCONSIN

Project Manager:		SCALE:	1 in = 2,000 ft
Project Engineer:			
Drawn By:	JCW	PROJECT NO.	**R3001381.00**
Checked By:	BDW		
Date:	1/31/2024	FIGURE NO.	**3-2**

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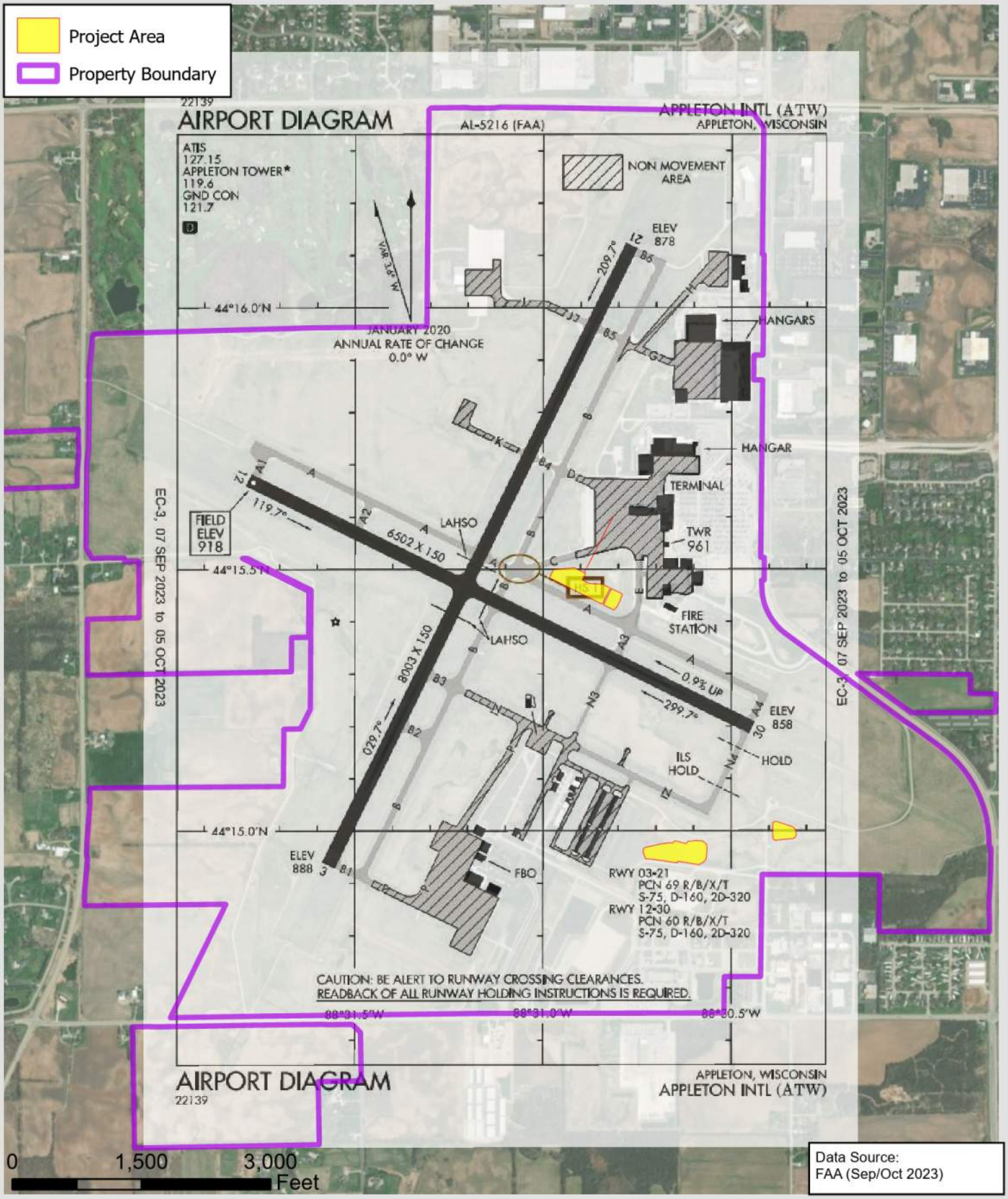

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AIRPORT DIAGRAM MAP

APPLETON INTERNATIONAL AIRPORT
VILLAGE OF GREENVILLE, OUTAGAMIE COUNTY, WISCONSIN

Project Manager:		SCALE: 1 in = 1,500 ft
Project Engineer:		
Drawn By:	JCW	PROJECT NO. R3001381.00
Checked By:	BDW	
Date:	1/31/2024	FIGURE NO. 3-3

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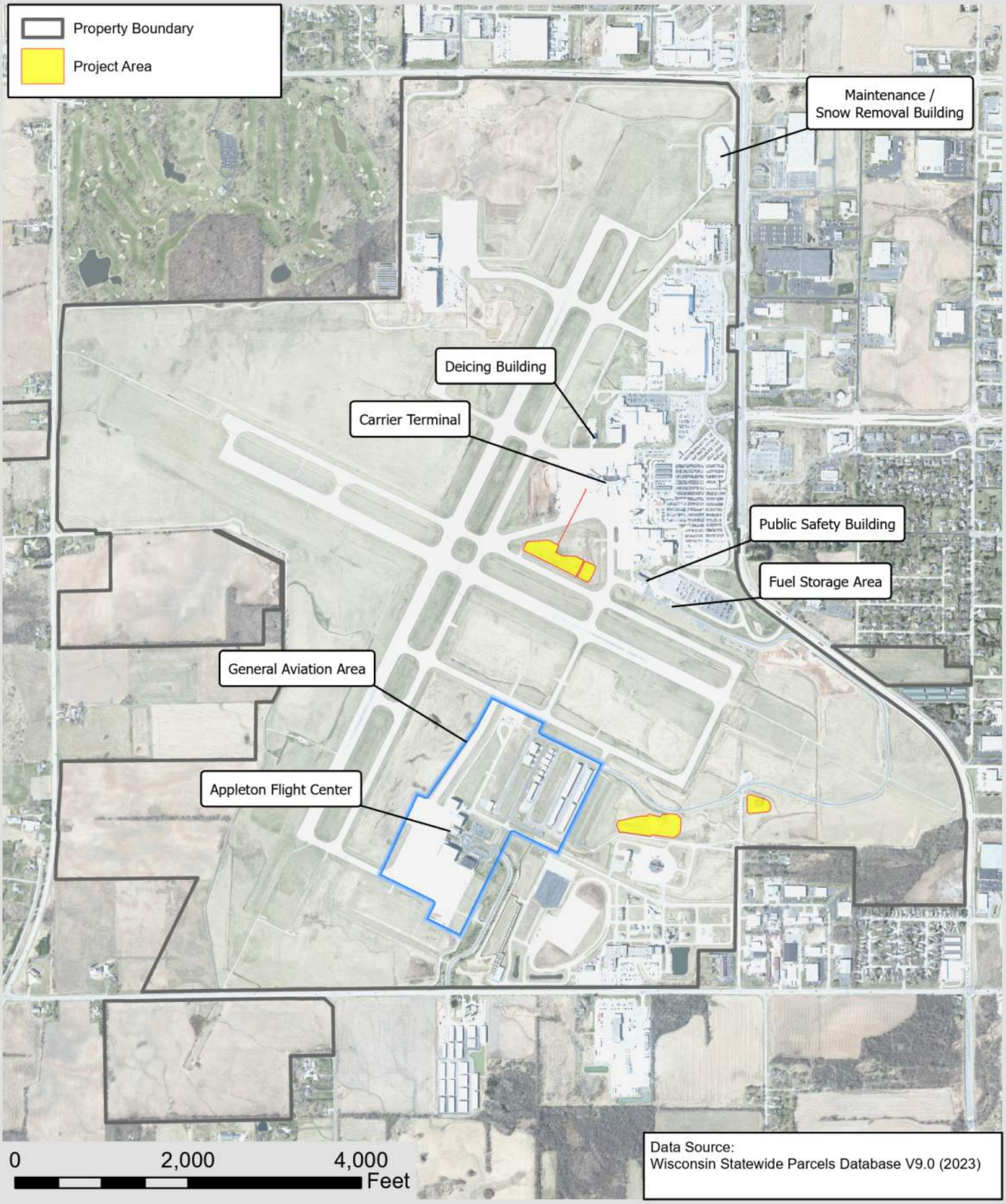

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AIRPORT LOCATIONS MAP

APPLETON INTERNATIONAL AIRPORT
VILLAGE OF GREENVILLE, OUTAGAMIE COUNTY, WISCONSIN

Project Manager:		SCALE: 1 in = 1,500 ft
Project Engineer:		
Drawn By:	JCW	PROJECT NO. **R3001381.00**
Checked By:	BDW	
Date:	2/22/2024	FIGURE NO. **3-4**

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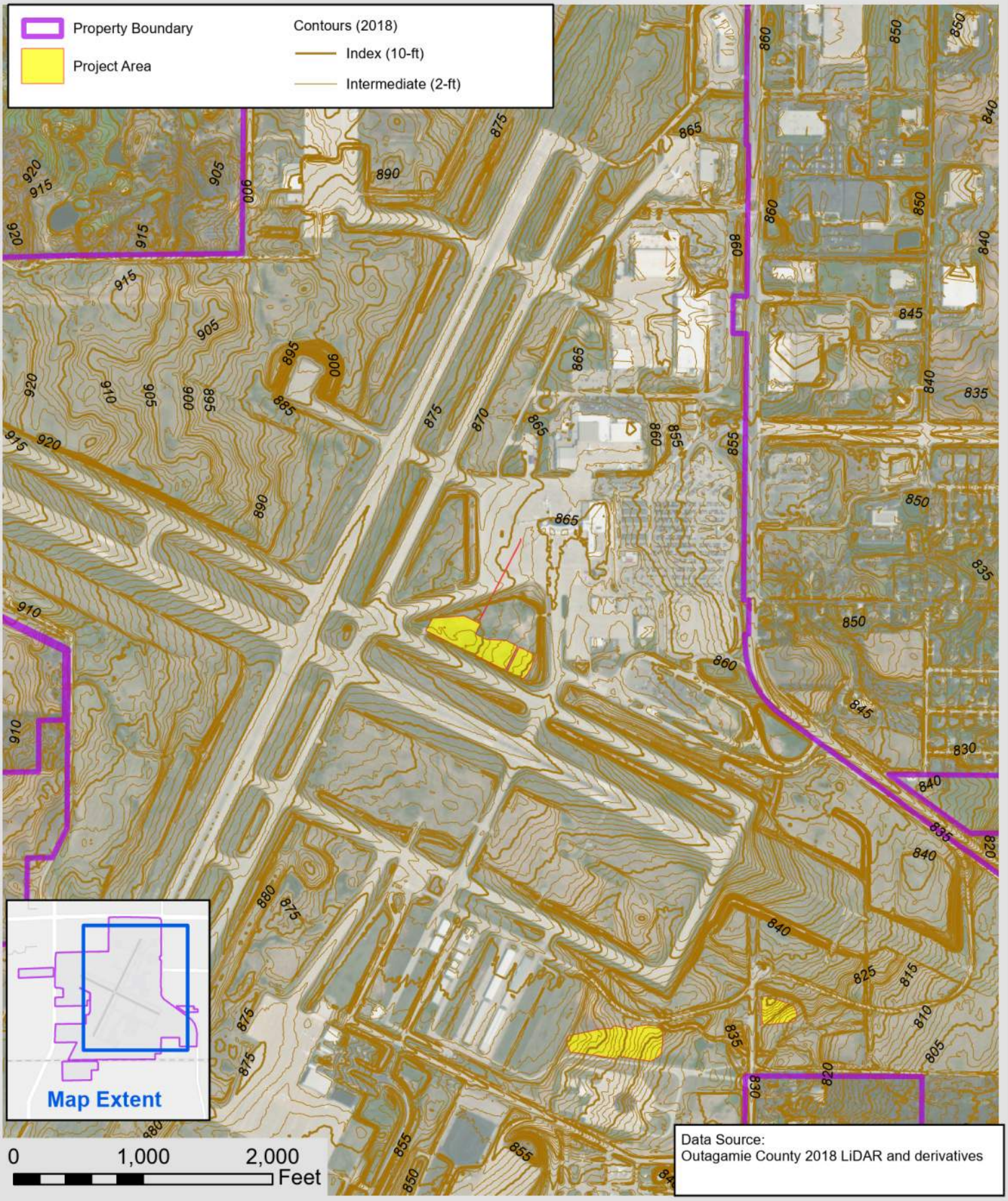

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TOPOGRAPHIC MAP

APPLETON INTERNATIONAL AIRPORT
VILLAGE OF GREENVILLE, OUTAGAMIE COUNTY, WISCONSIN

Project Manager:		SCALE: 1 in = 1,000 ft
Project Engineer:		
Drawn By:	JCW	PROJECT NO. R3001381.00
Checked By:	BDW	
Date:	2/22/2024	FIGURE NO. 3-5

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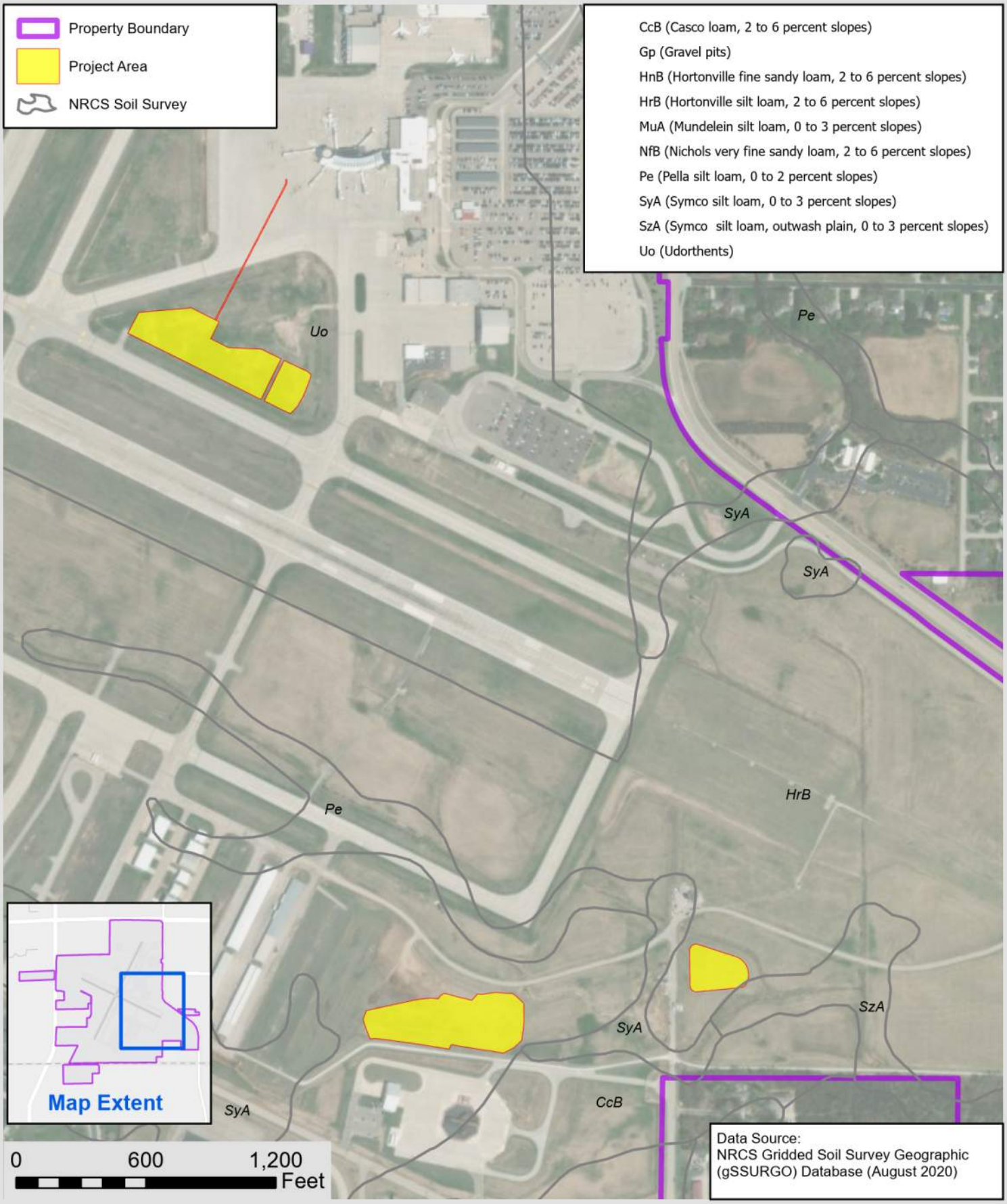

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SOILS MAP

APPLETON INTERNATIONAL AIRPORT
VILLAGE OF GREENVILLE, OUTAGAMIE COUNTY, WISCONSIN

Project Manager:		SCALE: 1 in = 600 ft
Project Engineer:		
Drawn By:	JCW	PROJECT NO. R3001381.00
Checked By:	BDW	
Date:	2/22/2024	FIGURE NO. 3-6

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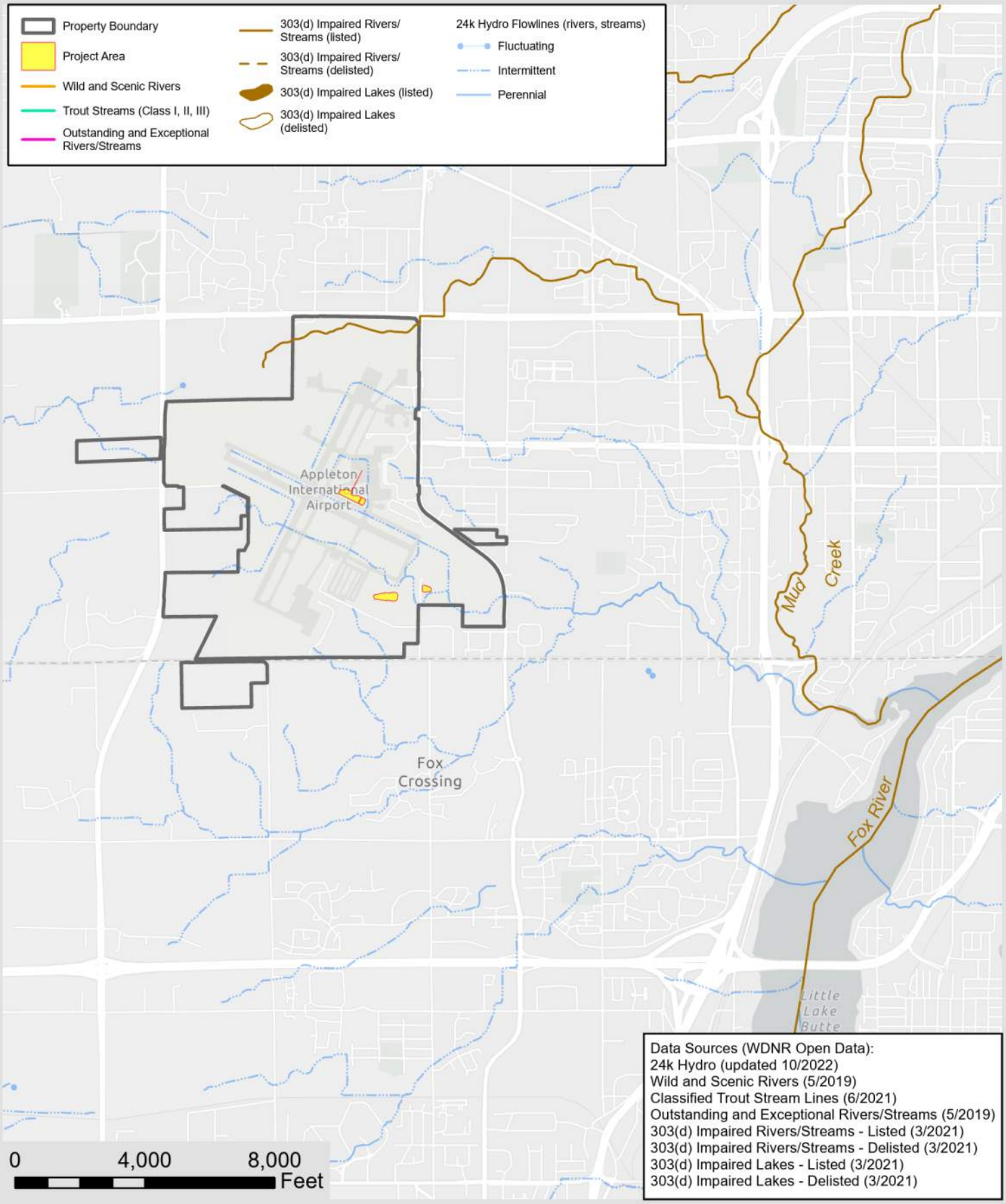

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DESIGNATED RESOURCE WATERS

APPLETON INTERNATIONAL AIRPORT
VILLAGE OF GREENVILLE, OUTAGAMIE COUNTY, WISCONSIN

Project Manager:		SCALE: 1 in = 4,000 ft
Project Engineer:		
Drawn By:	JCW	PROJECT NO. R3001381.00
Checked By:	BDW	
Date:	2/22/2024	FIGURE NO. 3-7

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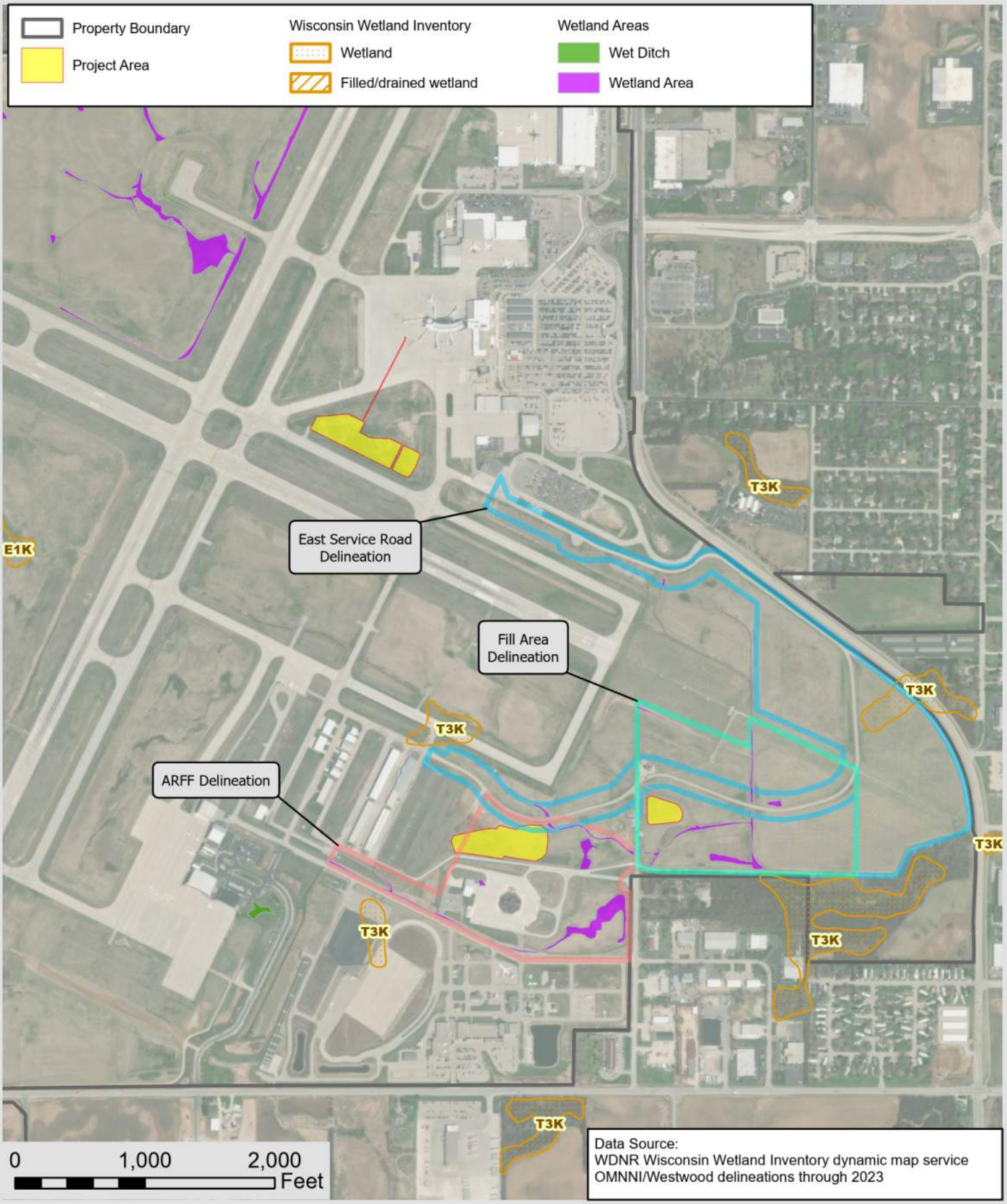

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WETLAND MAP

APPLETON INTERNATIONAL AIRPORT
VILLAGE OF GREENVILLE, OUTAGAMIE COUNTY, WISCONSIN

Project Manager:		SCALE: 1 in = 1,000 ft
Project Engineer:		
Drawn By:	JCW	PROJECT NO. R3001381.00
Checked By:	BDW	
Date:	2/22/2024	FIGURE NO. 3-8

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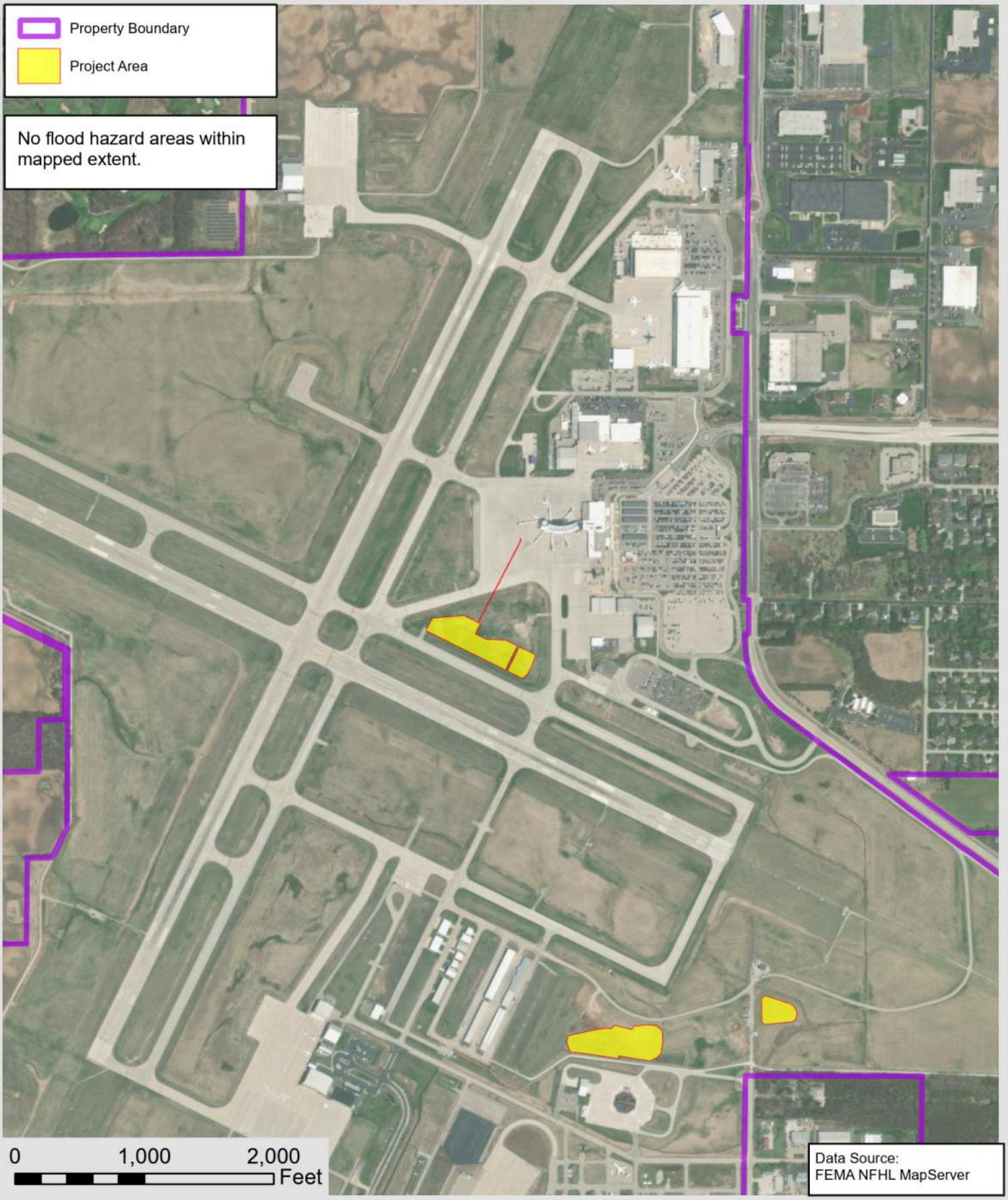

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FLOODPLAIN MAP

APPLETON INTERNATIONAL AIRPORT
VILLAGE OF GREENVILLE, OUTAGAMIE COUNTY, WISCONSIN

Project Manager:		SCALE:
Project Engineer:		1 in = 1,000 ft
Drawn By:	JCW	PROJECT NO.
Checked By:	BDW	**R3001381.00**
Date:	2/22/2024	FIGURE NO.
		3-9

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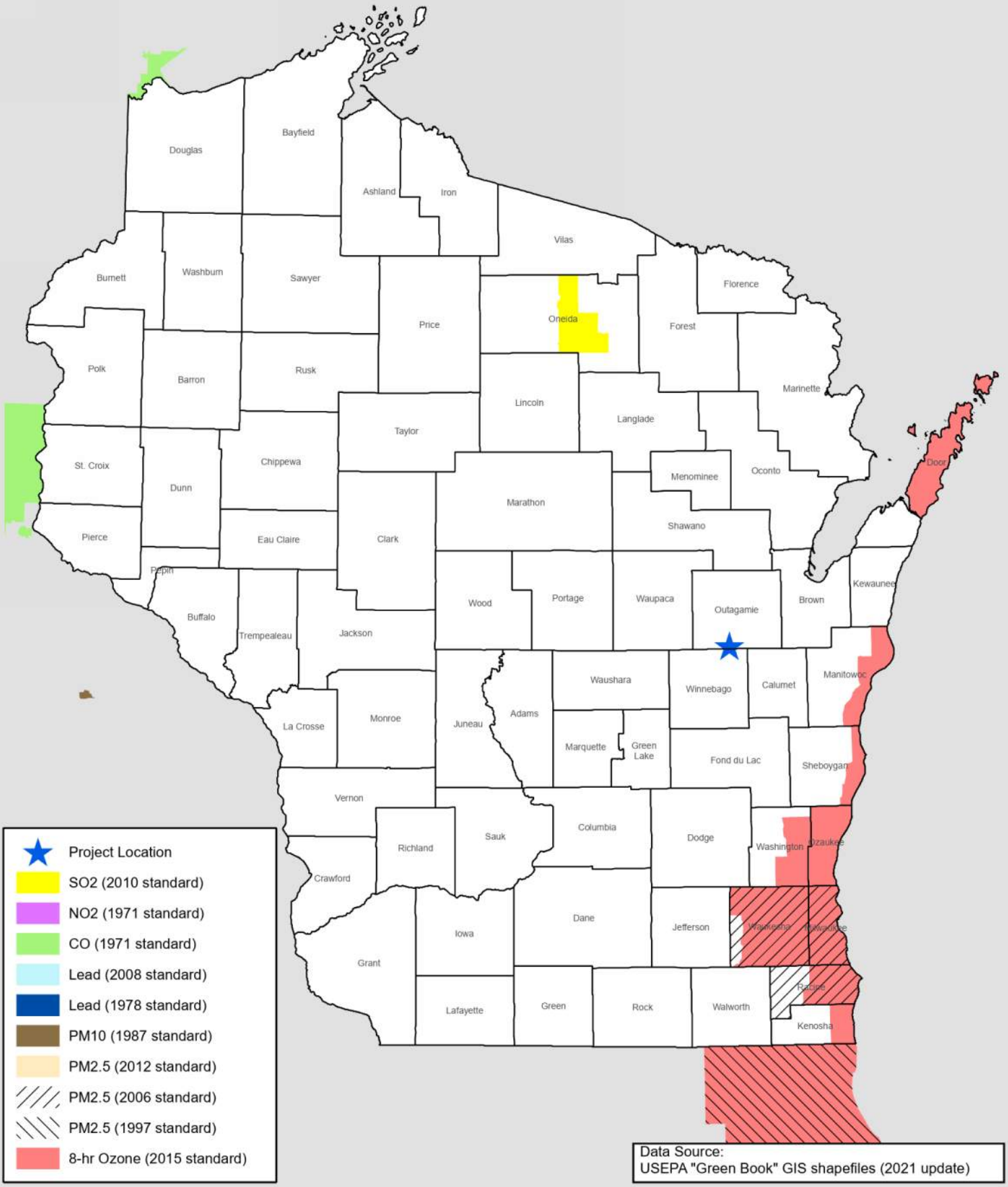

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APPLETON INTERNATIONAL AIRPORT
VILLAGE OF GREENVILLE, OUTAGAMIE COUNTY, WISCONSIN

Project Manager:		SCALE: 1 in = 208,333 ft
Project Engineer:		
Drawn By:	JCW	PROJECT NO. **R3001381.00**
Checked By:	BDW	
Date:	2/22/2024	FIGURE NO. **3-10**

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ECOLOGICAL LANDSCAPES

APPLETON INTERNATIONAL AIRPORT
VILLAGE OF GREENVILLE, OUTAGAMIE COUNTY, WISCONSIN

Project Manager:		SCALE:	1 in = 215,401 ft
Project Engineer:			
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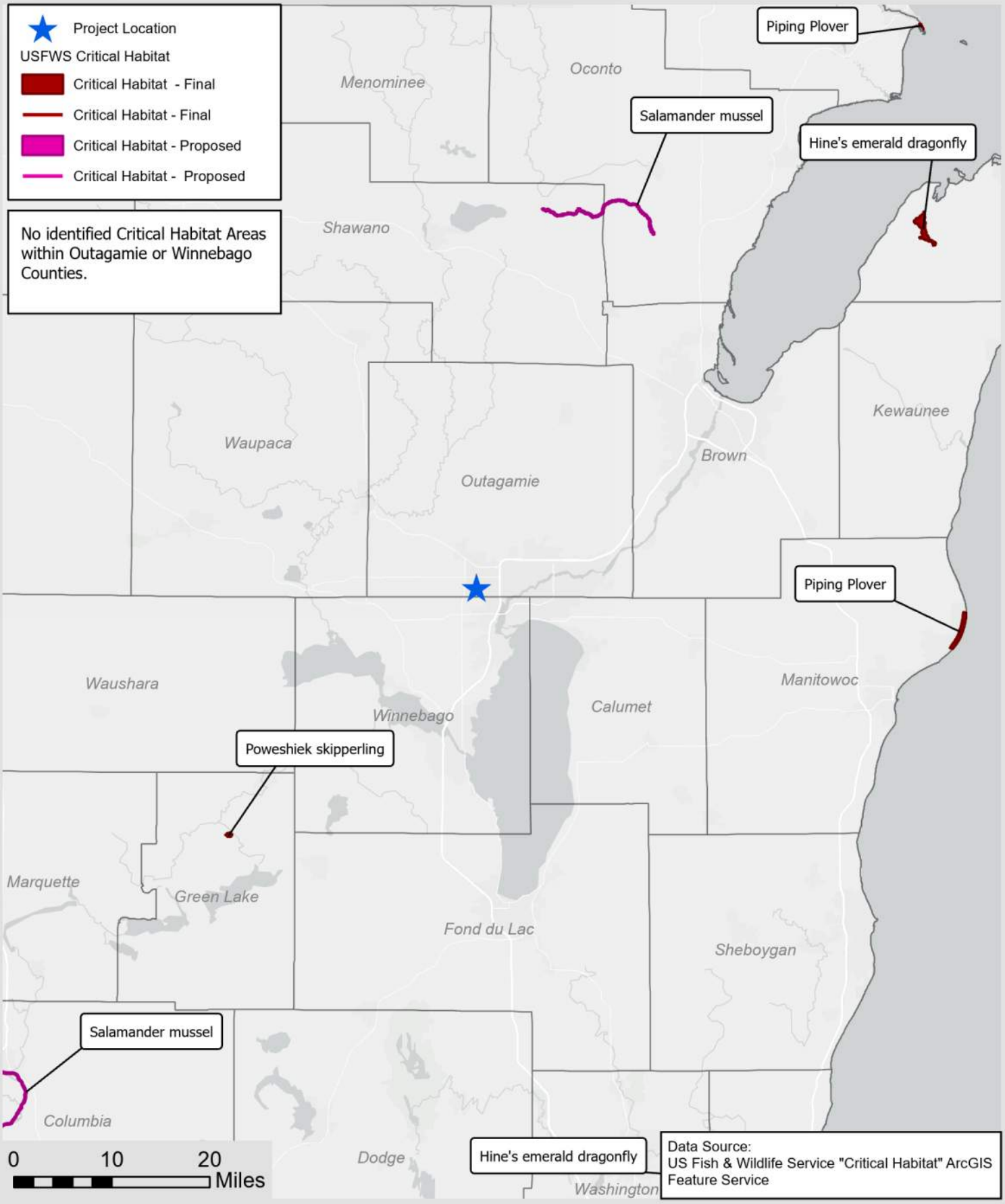
Checked By:	BDW		
Date:	2/22/2024	FIGURE NO.	**3-11**



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CRITICAL HABITAT AREAS

APPLETON INTERNATIONAL AIRPORT
VILLAGE OF GREENVILLE, OUTAGAMIE COUNTY, WISCONSIN

Project Manager:		SCALE: 1 in = 69,905 ft
Project Engineer:		
Drawn By:	JCW	PROJECT NO. R3001381.00
Checked By:	BDW	
Date:	2/22/2024	FIGURE NO. 3-12

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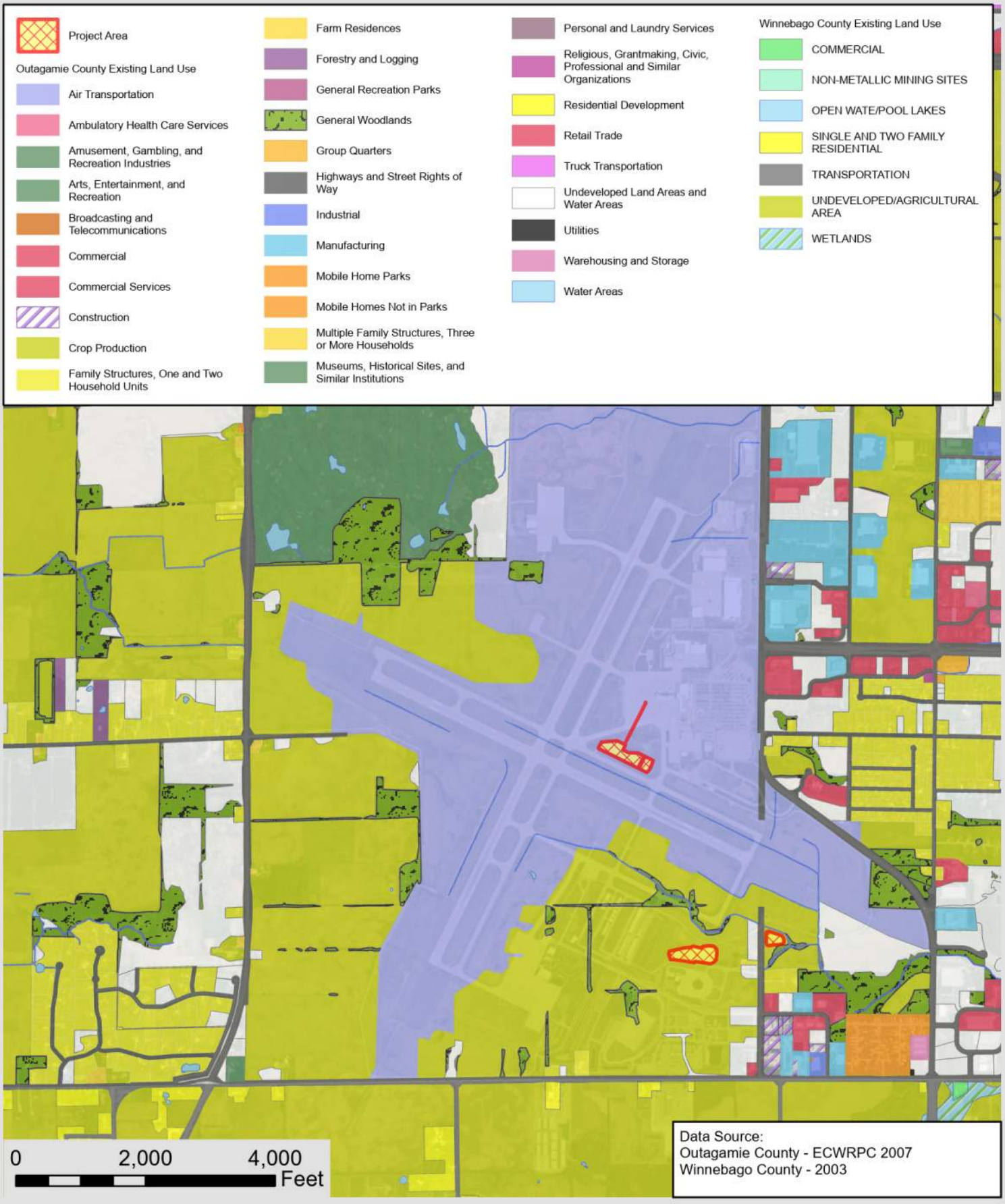

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GEOTHERMAL ENVIRONMENTAL ASSESSMENT

EXISTING LAND USE MAP

APPLETON INTERNATIONAL AIRPORT
VILLAGE OF GREENVILLE, OUTAGAMIE COUNTY, WISCONSIN

Project Manager:		SCALE: 1 in = 2,000 ft
Project Engineer:		
Drawn By:	JCW	PROJECT NO. **R3001381.00**
Checked By:	BDW	
Date:	2/22/2024	FIGURE NO. **3-13**

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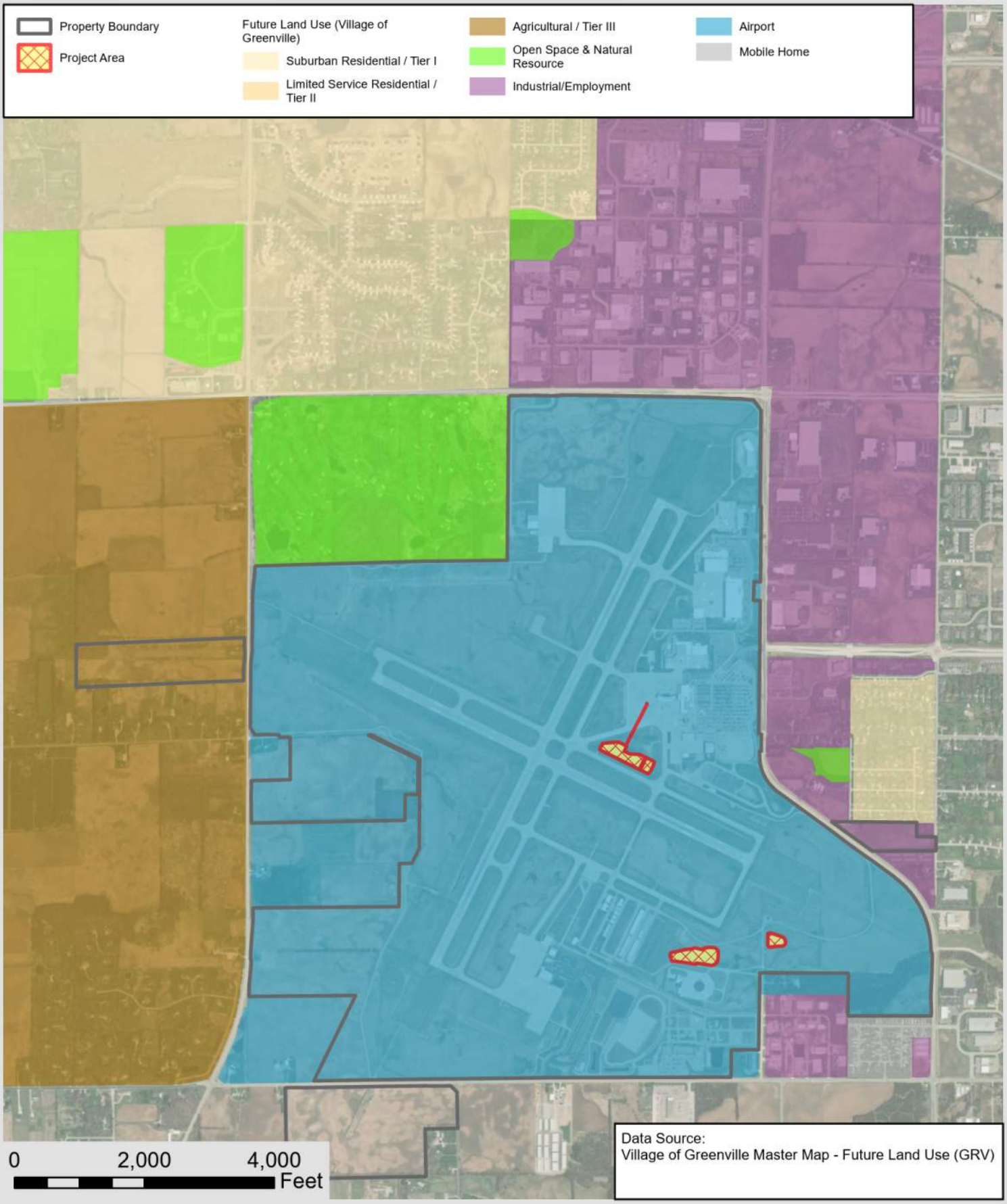

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GEOTHERMAL ENVIRONMENTAL ASSESSMENT

FUTURE LAND USE MAP

APPLETON INTERNATIONAL AIRPORT
VILLAGE OF GREENVILLE, OUTAGAMIE COUNTY, WISCONSIN

Project Manager:		SCALE:	1 in = 2,000 ft
Project Engineer:			
Drawn By:	JCW	PROJECT NO.	**R3001381.00**
Checked By:	BDW		
Date:	2/22/2024	FIGURE NO.	**3-14**

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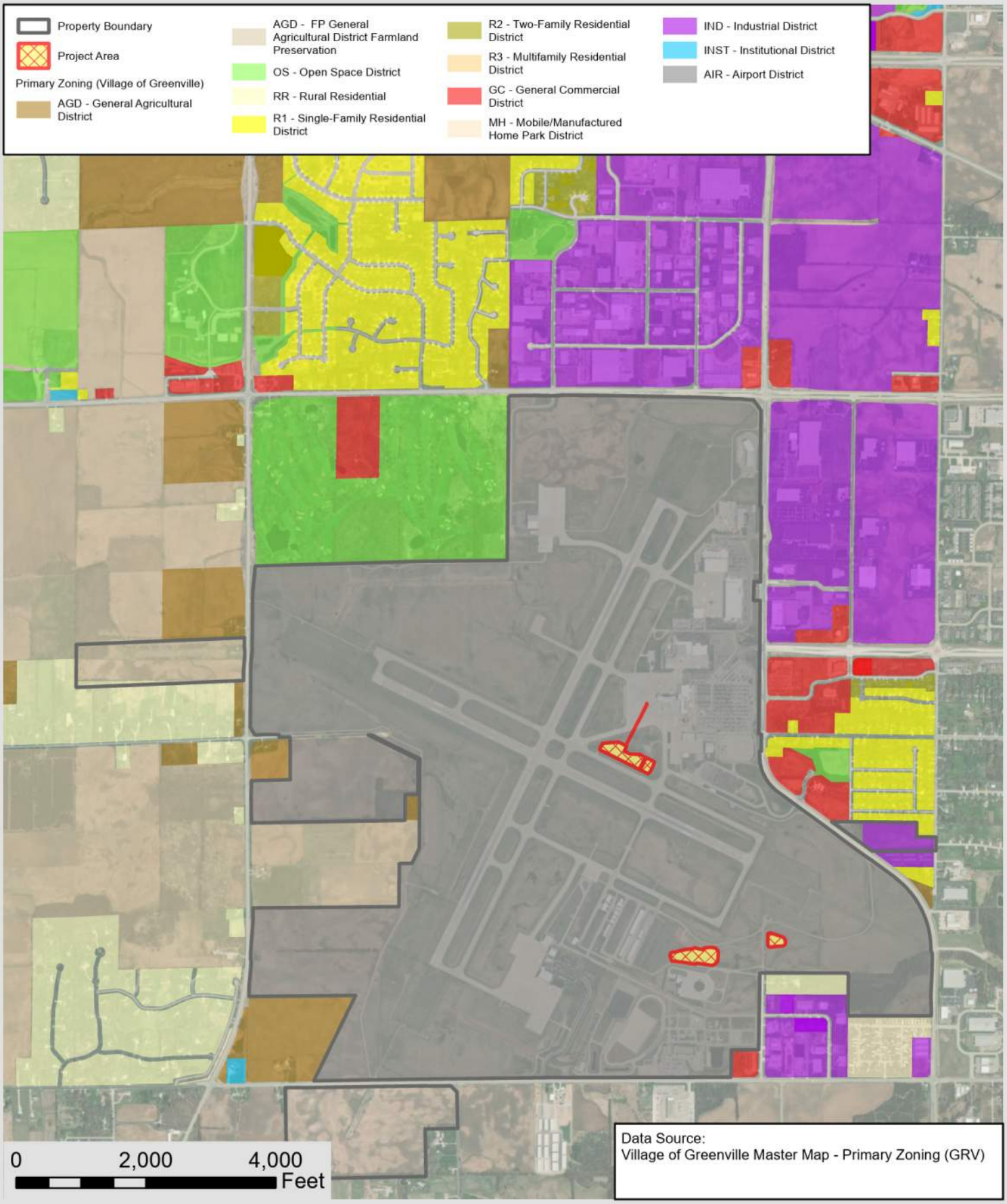

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GEOTHERMAL ENVIRONMENTAL ASSESSMENT

ZONING MAP

APPLETON INTERNATIONAL AIRPORT
VILLAGE OF GREENVILLE, OUTAGAMIE COUNTY, WISCONSIN

Project Manager:		SCALE: 1 in = 2,000 ft
Project Engineer:		
Drawn By:	JCW	PROJECT NO. **R3001381.00**
Checked By:	BDW	
Date:	2/22/2024	FIGURE NO. **3-15**

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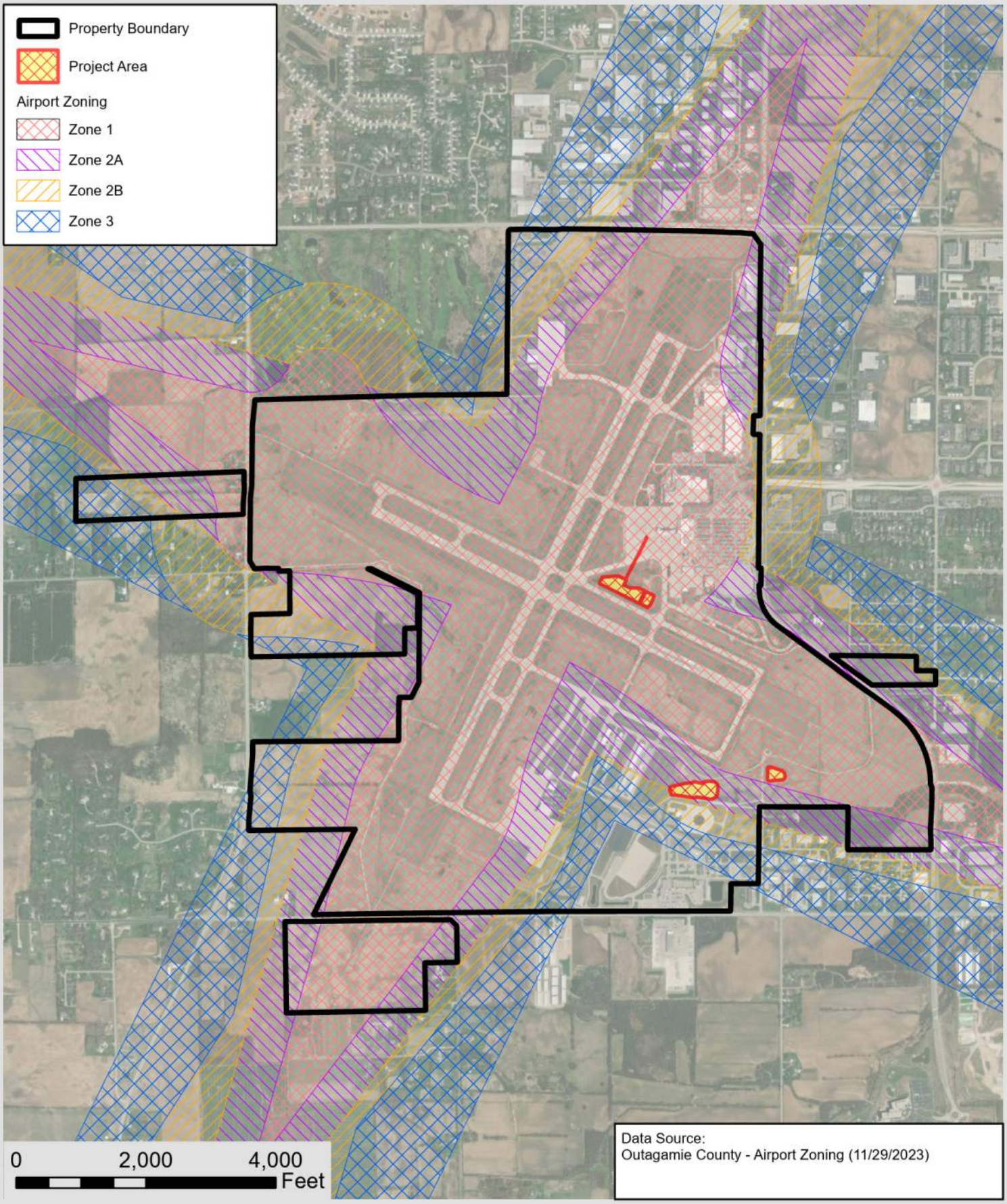

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GEOTHERMAL ENVIRONMENTAL ASSESSMENT

AIRPORT ZONING MAP

APPLETON INTERNATIONAL AIRPORT
VILLAGE OF GREENVILLE, OUTAGAMIE COUNTY, WISCONSIN

Project Manager:		SCALE: 1 in = 2,000 ft
Project Engineer:		
Drawn By:	JCW	PROJECT NO. **R3001381.00**
Checked By:	BDW	
Date:	2/22/2024	FIGURE NO. **3-16**

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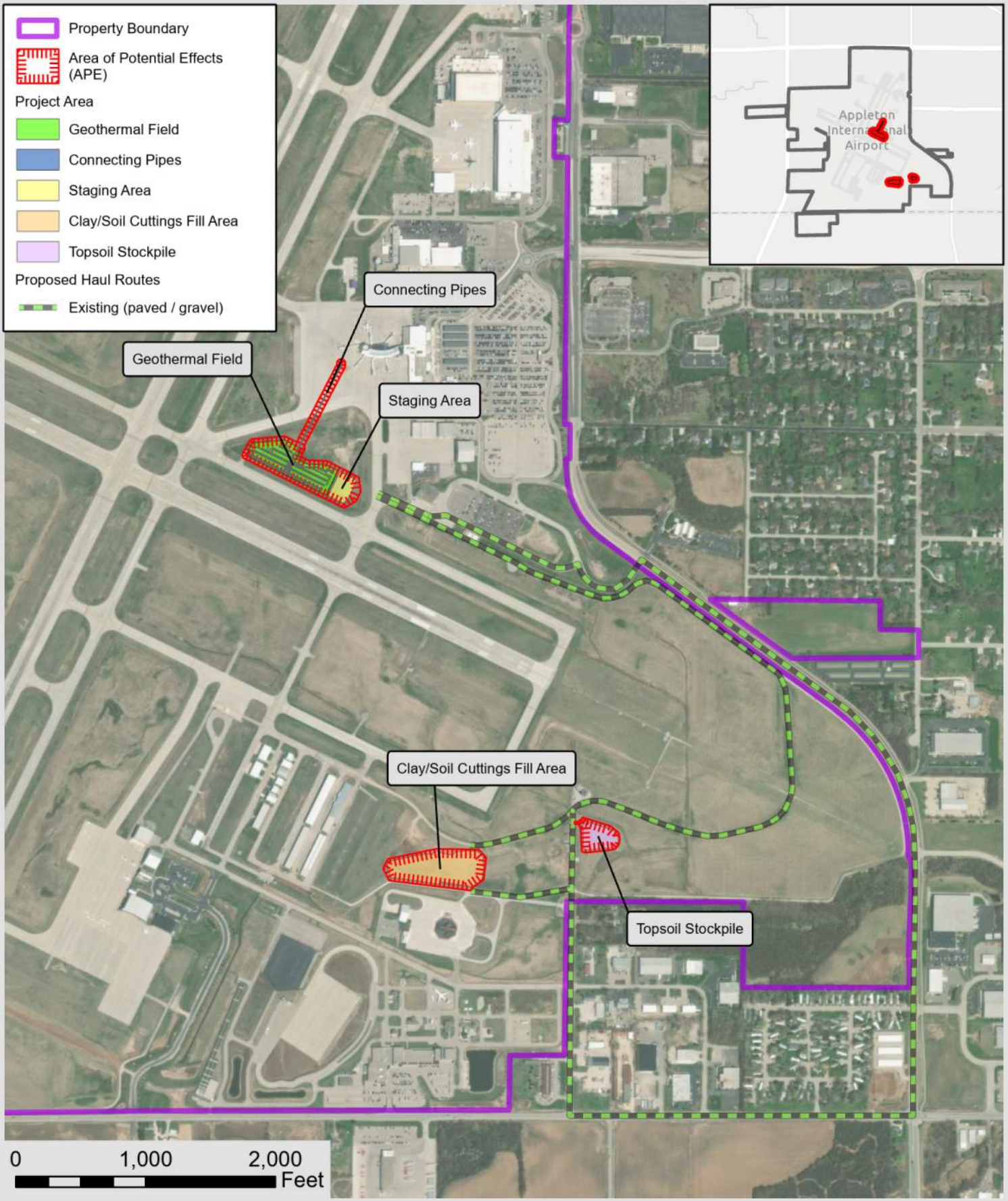

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AREA OF POTENTIAL EFFECTS

APPLETON INTERNATIONAL AIRPORT
VILLAGE OF GREENVILLE, OUTAGAMIE COUNTY, WISCONSIN

Project Manager:		SCALE: 1 in = 1,000 ft
Project Engineer:		
Drawn By:	JCW	PROJECT NO. R3001381.00
Checked By:	BDW	
Date:	2/22/2024	FIGURE NO. 3-17

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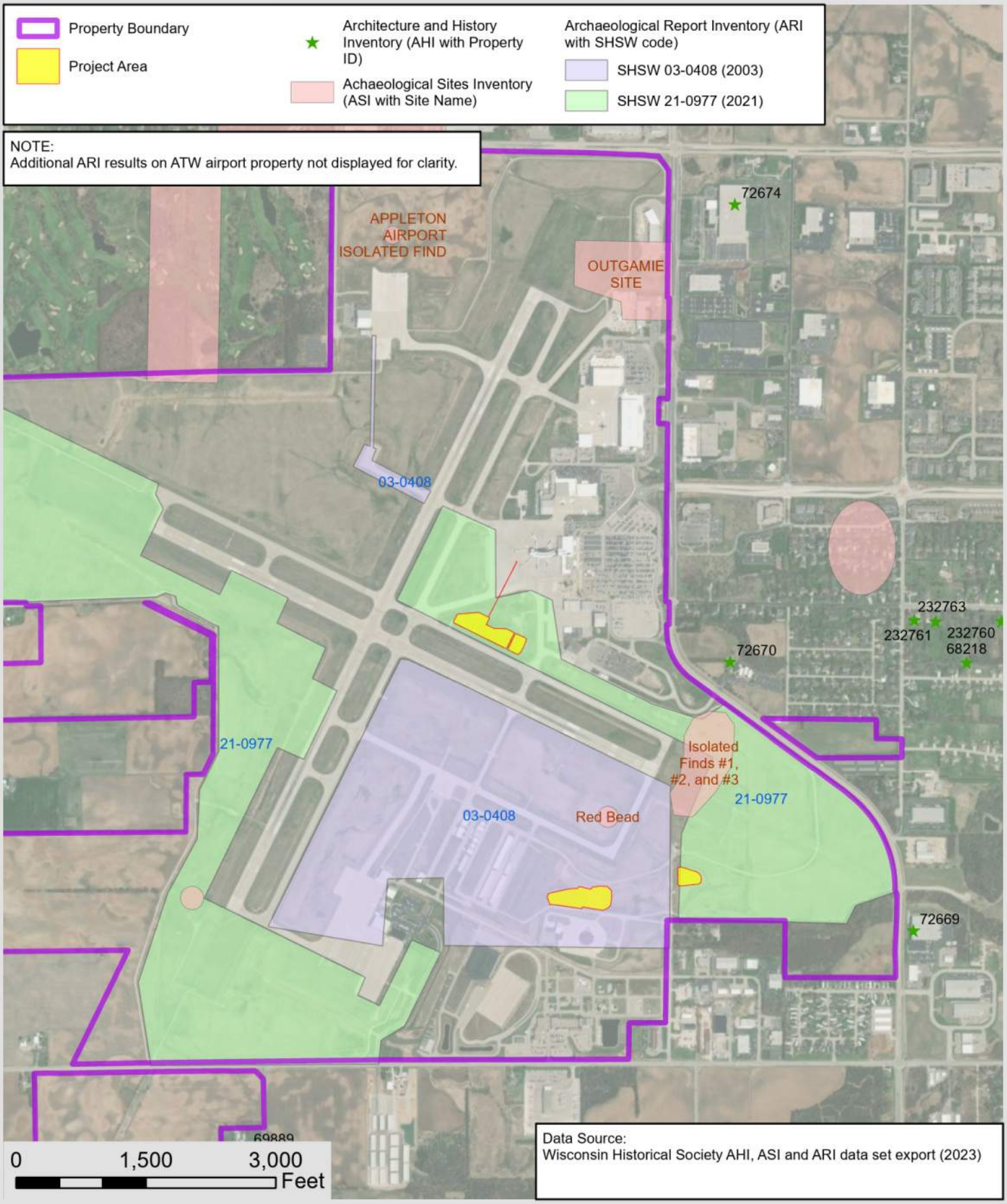

Westwood
1 Systems Drive
Appleton, WI 54914
(920) 735-6900
www.westwoodps.com

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GEOTHERMAL ENVIRONMENTAL ASSESSMENT

HISTORICAL SITES MAP

APPLETON INTERNATIONAL AIRPORT
VILLAGE OF GREENVILLE, OUTAGAMIE COUNTY, WISCONSIN

Project Manager:		SCALE: 1 in = 1,500 ft
Project Engineer:		
Drawn By:	JCW	PROJECT NO. R3001381.00
Checked By:	BDW	
Date:	2/22/2024	FIGURE NO. 3-18

F:\TR\JOBS\E2422A21 ATW Terminal Apron\Environmental\2023 Geothermal EA\GIS\EnvAssessmentMaps.aprx [Historical WHS Map]
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CHAPTER 4 - ENVIRONMENTAL CONSEQUENCES SPECIFIC IMPACT CATEGORIES

The Airport is proposing to construct a geothermal system as an energy efficient means of heating and cooling the passenger terminal building and the new addition to the terminal building. This Chapter describes the environmental consequences of the proposed action of constructing and operating a geothermal heating and cooling system for the passenger terminal building.

In accordance with the technical guidelines set forth in FAA Orders 1050.1F and 5050.4B and the Council on Environmental Quality Regulations, this chapter describes the environmental consequences of the alternatives that were outlined in Chapter 2 and evaluated in Chapter 3 Affected Environment. Impact is determined by comparing the anticipated environmental conditions after development to the environmental conditions should no development take place.

For purposes of this environmental assessment, the environmental consequences were determined for the No Action alternative and the Proposed Action alternative.

4.1 Air Quality

The Clean Air Act (CAA) is the federal law that regulates air emissions from area, stationary, and mobile sources. The first CAA, passed in 1967, required that air quality criteria necessary to protect the public health and welfare be developed. There have been several revisions to the CAA since 1967. The Clean Air Act Amendments of 1990 represent the fifth major effort to address clean air legislation. The CAA authorizes the United States Environmental Protection Agency (USEPA) to establish NAAQS to protect public health and the environment. The State Implementation Plan (SIP) is used by a state to control air pollution so that NAAQS will be met.

The USEPA Office of Air Quality Planning and Standards has set NAAQS for six principal pollutants, which are called "criteria" pollutants: carbon monoxide, lead, nitrogen dioxide, particulate matter less than 2.5 micrometers in diameter, ozone, and sulfur oxides[50]. Under the General Conformity Rule[51], federal agencies must work with state and local governments in a non-attainment or maintenance area (for air quality) to ensure that federal actions conform to the initiatives established in the SIP. Outagamie County does not fall into either a non-attainment or maintenance area for any of the criteria pollutants[52].

[50] National Ambient Air Quality Standards: https://www.epa.gov/criteria-air-pollutants/naaqs-table.

[51] General Conformity Rule: https://www.epa.gov/general-conformity/basic-information-about-general-conformity-rule.

[52] County-Level Multi-Pollutant Information: https://www3.epa.gov/airquality/greenbook/ancl.html#WI.

Air quality could be impacted during construction activities of the Proposed Action. Impacts may cause temporary specific impacts as a result of construction activities, exclusively during the construction period.

To reduce the potential for air quality impacts during construction, the special provisions for this project would require that motorized equipment shall be operated in compliance with all applicable local, state, and federal laws and regulations.

The Proposed Action alternative would not substantially impact air quality. The No Action alternative would not have an impact on air quality.

4.2 Climate

The Council on Environmental Quality (CEQ)[53] developed guidance in response to Executive Order 13990[54]. The CEQ guidance instructs federal agencies to evaluate impacts from GHG emissions during environmental reviews to ensure the consideration of climate impacts in Federal decision making[55].

Greenhouse Gases (GHGs) are defined as "gases that trap heat in the atmosphere". GHGs include carbon dioxide, methane, nitrous oxide, and fluorinated gases (hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and nitrogen trifluoride). Carbon dioxide is the primary GHG and accounted for 79% of all GHGs in 2021. Carbon dioxide is produced through the burning of fossil fuels, biological materials, chemical reactions, or solid waste[56]. Transportation accounts for 35% and electrical generation accounts for 31% of the total U.S. carbon dioxide emissions[57].

The Proposed Action Alternative is not anticipated to increase consumption of fuel by aircraft due to changes in ground movements or run-up times; by aircraft due to changes in flight patterns; or by ground vehicles due to changes in movement patterns for Airport service or other vehicles.

The passenger terminal addition will require a heating and cooling system. The proposed geothermal heating and cooling system would supply the heating and cooling needs for both the passenger terminal addition and the existing passenger terminal building. The existing passenger terminal building would realize a decrease in energy use with the geothermal

[53] The CEQ was established by NEPA in 1969: https://www.whitehouse.gov/ceq/

[54] EO 13990: https://www.federalregister.gov/documents/2021/01/25/2021-01765/protecting-public-health-and-the-environment-and-restoring-science-to-tackle-the-climate-crisis

[55] Biden-Harris Administration Releases New Guidance to Disclose Climate Impacts in Environmental Reviews: https://www.whitehouse.gov/ceq/news-updates/2023/01/06/biden-harris-administration-releases-new-guidance-to-disclose-climate-impacts-in-environmental-reviews/

[56] https://www.epa.gov/ghgemissions/overview-greenhouse-gases

[57] https://www.epa.gov/ghgemissions/overview-greenhouse-gases#carbon-dioxide

system. The new addition to the passenger terminal building would require an energy input, that currently isn't required of the existing system, to heat and cool the new space. **Table 2-1** Existing and Proposed Heating and Cooling System Comparison, in Section 2.3, Geothermal Heating and Cooling System for the Appleton International Airport Passenger Terminal Expansion Project (Proposed Action Alternative), provides a comparison of the existing and proposed heating and cooling needs.

The Proposed Action Alternative would increase electrical usage because of the increased square footage of the passenger terminal building; however, a geothermal heating and cooling system would use less energy than a traditional HVAC system. The No Action alternative would require more energy to heat and cool the passenger terminal building using traditional HVAC technologies because of the lower coefficient of performance when comparing traditional heating and cooling technologies to geothermal heating and cooling.

The Proposed Action Alternative would have a temporary increase in GHG emissions due to construction activities. Construction operations such as excavating and hauling materials, drilling the boreholes, and the production of construction materials would temporarily increase GHG emissions. Construction GHG emissions would mainly be carbon dioxide (CO_2) emissions from heavy equipment such as excavators, dozers, drill rigs, and dump trucks. Total diesel fuel needed for construction was estimated and converted to metric-tons (MT) of CO_2 equivalent, MT of methane (CH_4) equivalent, and MT of nitrous oxide (N_2O) equivalent. Estimates of GHG emissions are shown in **Table 4-1**.

The production of HDPE pipe that would be used in the geothermal borehole field and to transfer the heat exchange fluid between the borehole field and the passenger terminal building would also increase GHG emissions. Results of estimated CO2 emissions are shown in **Table 4-1**.

Table 4-1 Temporary Construction Emissions

		Proposed Action Alternative	No Action Alternative
Equipment Emissions	Diesel Fuel Consumption (gal)	32,800 gal	0 gal
	Carbon Dioxide CO2 Equivalent (metric tons)	334 MT-CO2e	0 MT-CO2e
	Methane CH4 Equivalent (metric tons)	0.033 MT-CH4e	0 MT-CH4e
	Nitrous Oxide N2O Equivalent (metric tons)	0.031 MT-N2Oe	0 MT-N2Oe
HDPE Pipe Emissions	Carbon Dioxide CO2 Equivalent (metric tons)	312 MT-CO2e	0 MT-CO2e

The assumptions and calculations for the construction equipment emission estimates and HDPE pipe are contained in Appendix 3. The construction of the Proposed Action Alternative would have temporary emissions from the construction activities. The No Action Alternative would not result in construction emissions.

4.3 Coastal Barriers

Coastal barriers occur on the coast lines of the United States and are protected by the Coastal Barriers Resources Act[58]. The Airport is not located within or adjacent to the Coastal Barrier Resource System. Therefore, the provisions of the Coastal Barriers Resources Act do not apply. There are no coastal barriers impacts with either the Proposed Action alternative or the No Action alternative.

4.4 Coastal Zone Management Program

The Wisconsin Coastal Management Program[59] was established in 1978 under the Federal Coastal Zone Management Act to protect and achieve a balance between natural resources preservation and economic development along Lake Michigan and Lake Superior. Fifteen counties in Wisconsin are adjacent to the great lakes and are under the Wisconsin Coastal Management Program. Outagamie County is not one of these counties. The Airport is not located within the jurisdiction of the state coastal management program. There are no Wisconsin Coastal Management Program impacts with either the Proposed Action alternative or the No Action alternative.

4.5 Compatible Land Use

The compatibility of existing and planned land uses surrounding an airport is usually associated with the extent of noise impacts related to the airport and additions of wildlife attractants. Increased noise levels during the construction and operation of the facility are discussed in Section 4.16 of this Chapter. Preliminary design for handling stormwater runoff from the proposed geothermal system would be through the use of a biofilter and existing dry pond to avoid standing water, which could be a wildlife attractant. Landscaping would conform to airport design guidance to minimize wildlife attractants.

The proposed project would be located on Airport property. The proposed location is zoned Airport District. The Proposed Action alternative would not substantially impact land uses surrounding the Airport. The No Action alternative would not have an impact on compatible land use.

4.6 Construction Impacts

Construction activities may cause temporary environmental impacts. Generally, these impacts are associated with noise resulting from construction equipment, potential impacts

[58] Coastal Barriers Resources: https://www.fws.gov/program/coastal-barrier-resources-act.

[59] Wisconsin Coastal Management Program: https://doa.wi.gov/Pages/LocalGovtsGrants/CoastalManagement.aspx.

on water quality from run-off and soil erosion from exposed surfaces, and air quality and dust emissions issues from equipment operation and soil handling.

Construction activities of the Proposed Action would cause temporary specific impacts as a result of construction activities, exclusively during the construction period.

Construction sound levels refer to instantaneous maximum sound levels as opposed to hourly average sound levels used to describe traffic noise and airport noise. The noise generated by construction equipment would vary greatly, depending on equipment type, equipment model, equipment make, duration of operation, and specific type of work being performed. However, typical noise levels may occur in the 75 to 95 decibels, adjusted (dBA) range at a distance of 50 feet. Noise from construction is not expected to surpass the noise from aviation operations. Adverse effects related to construction noise are anticipated to be of a localized, temporary, and transient nature.

To reduce the potential impact of construction noise, the special provisions for this project would require that motorized equipment shall be operated in compliance with all applicable local, state, and federal laws and regulations relating to noise levels permissible within and adjacent to the project construction site. At a minimum, the special provisions would require that motorized construction equipment will not be operated between 10:00 p.m. and 6:00 a.m. without prior written approval of the Airport. All motorized construction equipment would be required to have mufflers and exhaust systems constructed in accordance with equipment manufacture's specifications or systems of equivalent noise reducing capacity, maintained in good operating condition, free from leaks or holes.

An erosion control implementation plan and a storm water management plan would be prepared in accordance with Chapter Trans 401: Construction site erosion control and storm water management procedures for department actions. The WDNR would be provided a copy of each of these plans prior to construction. Additional permit and approval requirements are discussed in Section 2.3 Geothermal Heating and Cooling System for the Appleton International Airport Passenger Terminal Expansion Project (Proposed Action Alternative) and Section 5.5 Coordination With Public Agencies and State and Local Officials.

Construction activities would create temporary air quality degradation from equipment exhaust emissions and earth moving and grading operations. The impact would be localized, and are not anticipated to be disruptive to occupants of residences adjacent to the Airport. To minimize the potential impact on nearby residents and to avoid contributing to the degradation of regional air quality, dust from boring, excavating, stockpiling, hauling, and constructing should be controlled by watering or other approved dust control measures and appropriate construction sequences.

During the construction period soil would be exposed to the elements resulting in the potential for erosion. The proposed topsoil stockpile location and the proposed clay/soil cutting fill location would be located near drainage ditches, intermittent streams, and wetlands. Measures to limit the impacts of construction include: 1) Limit the area of erosive land exposed at any one time through construction scheduling. Limit the duration of such exposure before application of temporary erosion control measures or final revegetation to the extent practicable. Establish vegetation as soon as possible. 2) Perform operations in or

adjacent to drainage routes and ditches carefully to avoid washing, sloughing or deposition of materials in them. If possible, operations should be carried out during dry weather. Use silt fence and other Best Management Practices (BMP) to remove sediment from overland flow. 3) Reduce the volume and velocity of water that crosses disturbed areas by means of planned engineering methods (e.g., diversions, detention basins, berms). 4) Maintain existing vegetative buffers between construction areas and drainage areas and wetlands. Avoid removal of surface vegetation whenever possible. 5) Incorporate erosion control measures at areas of stockpiled soil. These controls would minimize the potential of soil erosion into surface water features.

Construction related effects other than sedimentation could impact water quality and aesthetic value. To avoid these impacts, if water used during the construction work becomes contaminated by oil, bitumens, harmful or objectionable chemicals, sewage or other pollutants, the water should be disposed of in an acceptable manner to avoid affecting nearby waters and lands. The contractor should not discharge pollutants into any water course or water storage area. Physical removal of maintained grass and other vegetation should be used in lieu of herbicides.

FAA Advisory Circular 150/5370-10H, Standard Specifications for Construction of Airports, Item C-102, Temporary Air and Water Pollution, Soil Erosion and Siltation Control and the Wisconsin Department of Transportation Standard Specifications would be incorporated in project design specifications to further mitigate potential construction impacts. These standards include temporary measures to control pollution of air and water, soil erosion, and siltation through the use of silt fences, berms, dikes, dams, sediment basins, fiber mats, gravel, mulches, grasses, slope drains, and other erosion control devices or methods. Additional approval, oversight and permit requirements would also mitigate potential construction impacts. (Reference Section 2.3 Geothermal Heating and Cooling System for the Appleton International Airport Passenger Terminal Expansion Project (Proposed Action Alternative) and Section 5.5 Coordination With Public Agencies and State and Local Officials.)

By implementing mitigation measures described in this section, no substantial construction impacts are anticipated with the Proposed Action alternative operating in accordance with all permit requirements. There are no construction impacts with the No Action alternative.

4.7 Cumulative Impacts

According to 40 CFR 1508.7, a cumulative impact "is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively substantial actions taking place over a period of time."

Past and ongoing Airport projects include the General Aviation area development, Runway 3/21 extension, the perimeter road, Taxiway N construction, construction of the Public Safety Training Center, construction of the ARFF, development of the Air Industrial Park, constructing the passenger terminal expansion, and constructing the terminal apron expansion. Biotic resources are intentionally limited to make the Airport uninviting to wildlife. Most of the Airport's non-developed areas are mowed turf. For the Taxiway N project, an intermittent channelized drainageway was relocated. The relocated drainageway

was designed to decrease erosion and increase the oxygenation of the stormwater. Past projects have complied with state and local stormwater regulations. Overall, airports typically have lower composite runoff coefficients and higher time of concentrations than other types of development due to the amount of open space required for safe operations. Designs of past Airport projects have been adjusted to avoid or minimize wetland impacts.

As described in section 1.4, Other Contemplated Actions, of Chapter 1, there are several potential improvements on the Airport and near the Airport over the 2024 through 2031 time period. Future improvements to the Airport would be related to meeting the needs of the users and surrounding community. With the exception of land acquisition, these improvements are anticipated to take place on existing Airport property. Most of the potential improvements to the Airport involve some form of construction. Therefore, the potential does exist for minor and short-term impacts from the potential improvements; however, cumulative effects are not anticipated to be substantial.

The two major projects planned around the Airport are the I-41 Expansion Project (De Pere to Appleton) and the Wis 76 / School Road Intersection Project. The I-41 Expansion Project performed an EA[60], which concluded that reconstructing the corridor would not result in significant impacts on the quality of the environment. The Wis 76 / School Road Intersection Project will construct a roundabout at the intersection. The purpose of the project is to address safety and level of service issues at the WIS 76 and School Road intersection.

Both these transportation projects involve construction, so there is the potential for minor and short-term impacts from the potential improvements; however, cumulative effects are not anticipated to be substantial.

The installation of the proposed geothermal heating and cooling system utilizes readily available materials, components, and resources that are not in short supply and share few materials, components, and resources with the other contemplated actions. The Proposed Action alternative combined with the other area projects are not anticipated to have significant cumulative impacts. There are no cumulative impacts with the No Action alternative.

4.8 Department of Transportation Act, Section 4(f) and 6(f) resources

Section 4(f) of the Department of Transportation Act of 1966, as amended, provides that the Secretary of Transportation shall not approve any program or project which requires the use of any publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance or land of a historic site of national, state or local significance as determined by the officials having jurisdiction thereof unless there is no feasible and prudent alternative to the use of such land and such program or project includes all possible planning to minimize harm resulting from the use.

[60] https://i41project.wisconsindot.gov/project-resources#:~:text=WisDOT%20completed%20an%20environmental%20assessment,the%20quality%20of%20the%20environment.

The federal government established the Land and Water Conservation Fund Program in 1965 to increase the net quantity of public, outdoor recreational space. Section 6(f) of this Act provides matching funds to states or municipalities for planning, improvements, or acquisition of outdoor recreational lands. Section 6(f) provides protection to ensure that lands acquired or developed with Land and Water Conservation Funds remain available for public outdoor recreation unless there are compelling reasons and appropriate processes for conversion to other uses.

The proposed project would be located on Airport property. No public parks, recreational areas, national lands, state lands, or historic sites were identified in the immediate area around the Airport. **Figure 4-1** shows the Airport property boundary, the proposed project locations on the Airport, and surrounding parks and trails.

No Section 4(f) lands or Section 6(f) lands would be impacted with either the Proposed Action alternative or the No Action alternative.

4.9 Farmland

The Farmland Protection Policy Act[61] (FPPA) authorizes the Department of Agriculture to develop criteria for identifying the effects of Federal programs on the conversion of farmland to nonagricultural uses. Federal agencies are directed to use the guidelines established by the Department of Agriculture to: 1) identify and take into account the adverse effects of Federal programs on the preservation of farmland, 2) consider appropriate alternative actions which could lessen adverse effects, and 3) assure that such Federal programs, to the extent practicable, are compatible with state, local government, and private programs and policies to protect farmland.

A project that involves the acquisition of farmland, which will be converted to nonagricultural use, must determine whether any of that land is protected by the FPPA. Farmland protected by the FPPA is classified as either prime farmland (which is not already committed to urban development or water storage), unique farmland, or farmland, which is of state or local importance (as determined by appropriate state or local government agency with the concurrence of the Secretary of Agriculture).

The proposed project site has had a history of farming. The land is currently a mowed grass field and disturbed areas with no structures on them. Proposed project site photographs, illustrating current land use, are included in Appendix 1.

The Airport already owns the land where the proposed geothermal borehole field would be located and the proposed topsoil stockpile and the proposed clay/soil cutting fill would be placed. There would be no acquisition of farmland for the Proposed Action. There are no farmland impacts with the No Action alternative.

[61] Farmland Protection Policy Act:
https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/landuse/fppa/

4.10 Federally-Listed Endangered and Threatened Species

Section 7 of the Endangered Species Act of 1973, as amended, requires each federal agency to ensure that "…any action authorized, funded, or carried out by such agency…is not likely to jeopardize the continued existence of any endangered species or threatened species or results in the destruction or adverse modification of habitat of such species which is determined by the Secretary, after consultation as appropriate with the affected States, to be critical, unless such agency has been granted an exemption for such action by the Committee…" Section 7a(3) further requires that "each Federal agency shall confer with the Secretary on any agency action which is likely to jeopardize the continued existence of any species proposed to be listed under Section 4 or results in the destruction or adverse modification of critical habitat proposed to be designated for such species."

The proposed project areas were entered into the WDNR's NHI Public Portal. No endangered resources have been recorded for the proposed development areas. No actions were required/recommended.

The U.S. Fish & Wildlife Services Threatened & Endangered Species Active Critical Habitat Report was reviewed. There were no areas identified within the mapped extents. **Figure 4-2** shows the Airport property boundary, the proposed project locations on the Airport, and critical habitat areas, if present.

The U.S. Fish & Wildlife Service's Information for Planning and Consultation (IPaC) online planning tool was used to obtain a list of species and habitat that could potentially be impacted. There were no critical habitats identified within the proposed project area.

The U.S. Fish & Wildlife Service's, Environmental Conservation Online System (ECOS) was referenced for the listed species. Information pages on the listed species were reviewed. **Table 4-2** is a summary of the federally listed species evaluation.

Table 4-2 IPaC Effect Determination Summary

SPECIES (COMMON NAME)	SCIENTIFIC NAME	LISTING STATUS	HABITAT	PRESENT IN PROJECT AREA	EFFECT DETERMINATION	JUSTIFICATION
Northern Long-eared Bat	*Myotis septentrionalis*	Endangered	Hibernates in caves and mines-swarming in surrounding wooded areas in autumn. During summer, roosts and forages in upland forests.	No	May affect, not likely to adversely affect	There is no suitable habitat in the project area. NLEB Range wide Determination Key Completed, Consistency Letter Obtained 01/23/2024.
Tricolored Bat	*Perimyotis subflavus*	Proposed Endangered	Hibernates in caves and mines. During spring, summer, and fall; found in forested areas.	No	May affect, not likely to adversely affect	There is no suitable habitat in the project area. Minnesota-Wisconsin Endangered Species Determination Key, Consistency Letter Obtained 01/23/2024.
Whooping Crane	*Grus americanus*	Experimental Population, Non-Essential	Open wetlands and lakeshores	No	No effect	There is no suitable habitat in the project area. Minnesota-Wisconsin Endangered Species Determination Key, Consistency Letter Obtained 01/23/2024.
Monarch Butterfly	*Danaus plexippus*	Candidate	Wherever found	No	No effect	There is no suitable habitat in the project area. Minnesota-Wisconsin Endangered Species Determination Key, Consistency Letter Obtained 01/23/2024.
Date of Official Species List: June 19, 2024						

U.S. Fish & Wildlife Coordination under the Endangered Species Act is not required for this project because the project will not result in impacts to federally-listed species, proposed species, or designated or proposed critical habitat.

An Initial Project Review request was sent to the WDNR by the Bureau of Aeronautics (BOA). Based on the WDNR's review of the NHI, the project is more than one mile away from known Northern Long-eared Bat and Tricolored Bat roost sites and hibernacula. The project is also located outside of any High Potential Zones for the Rusty Patched Bumblebee. (Reference WDNR Initial Review correspondence, Appendix 2.)

Based on information reviewed and consultation with the agencies, the Proposed Action alternative would not have a substantial effect on federally listed, proposed, or candidate species or federally designated or proposed critical habitat; or state listed endangered, threatened, or otherwise sensitive species, natural plant communities, or natural features. The No Action alternative would not have an impact on fish, wildlife, and plants, including threatened and endangered species.

4.11 Fish, Wildlife, and Plants

The biological character of the proposed project areas after construction and restoration would be similar to the character prior to construction. The geothermal borehole field would be restored to a mowed grass field. The topsoil stockpile would eventually be restored to a mowed grass area as the topsoil is repurposed. The clay/soil cutting fill location would become a mowed grass area and eventually used for general aviation hangars.

The USFWS IPaC tool was used to generate a list of threatened and endangered species that may occur in the proposed project locations. For the species listed, there were no critical habitats found in or near the project areas. Section 3.11 Biotic Communities provides additional information.

The WDNR, through the Wisconsin NHI Program, is working to locate and document occurrences of rare species and natural communities, including state and federal endangered and threatened species. Occurrences are mapped in general terms to protect the species from destruction. Based on a WDNR review of the NHI Portal on December 6, 2023, for the proposed project areas, they concluded that "there are no known listed species or suitable habitat that could be impacted by this project." (Reference DNR Initial Review correspondence, Appendix 2.)

Visual observations of the proposed project areas noted mowed grass and disturbed land. Streams[62], critical habitat or trees were not observed. Current Airport operating procedures actively discourages migratory bird concentrations because of safety concerns. Proposed project site photographs, illustrating recent land use, are included in Appendix 1.

The Proposed Action alternative would take place in previously disturbed areas. No federal or state listed threatened or endangered species have been identified on the proposed

[62] There are no streams through the proposed project areas. There are intermittent streams surrounding the proposed project areas.

project location. The Proposed Action alternative would not have an effect on state listed threatened or endangered species. The No Action alternative would not have an impact on fish, wildlife, and plants, including threatened and endangered species.

4.12 Floodplains

Floodplains are defined in Executive Order 11988[63], Floodplain Management, as "the lowland and relatively flat areas adjoining inland and coastal waters including flood prone areas of offshore islands, including at a minimum, that area subject to a one percent or greater chance of flooding in any given year." (100-year flood). Executive Order 11988 directs Federal agencies to take action to reduce the risk of flood loss, minimize the impact of floods on human safety, health and welfare, and restore and preserve the natural and beneficial values served by floodplains.

The Department of Transportation Order 5650.2, Floodplain Management and Protection, further defines the natural and beneficial values served by floodplains as including but not limited to "natural moderation of floods, water quality maintenance, groundwater recharge, fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, and forestry." The Executive Order and the Department of Transportation Order establish a policy to avoid taking an action within a 100-year floodplain where practicable.

Flood insurance rate maps prepared by FEMA determine the limits of 1% and 0.2% annual chance floodplains (commonly referred to as 100-year and 500-year floodplains). Flood insurance rate maps prepared by the FEMA were reviewed to determine the limits of base floodplains associated with the Proposed Action. **Figure 4-3** graphically represents Flood Hazard Zones from FEMA's Web Map Service overlaid onto a map of the area surrounding the proposed project site. The proposed site location is in Zone X, which designates areas outside of the 100-year and 500-year floodplains on the Flood Insurance Rate Map. The Proposed Action is not anticipated to be in a 100-year flood area.

There are no floodplain impacts anticipated with either the Proposed Action alternative or the No Action alternative.

4.13 Hazardous Materials, Pollution Prevention, and Solid Waste

A Phase I Environmental Site Assessment[64] was conducted on the proposed project areas. The results of the Phase I Environmental Site Assessment indicated that it was unlikely that

[63] On May 20, 2021, President Biden signed Executive Order (EO) 14030, Climate-Related Financial Risk, reinstating EO 13690, Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input (January 30, 2015). EO 13690 amends the original floodplain management standard established in 1977 by EO 11988, and was revoked by EO 13807 in August 2017, though is now reinstated.

[64] Reference *Phase I Environmental Site Assessment, Appleton International Airport - Geothermal*, prepared by Westwood Professional Services, Inc., dated January 29, 2024.

the proposed project areas had been directly contaminated with hazardous materials from either on-site activities or off-site operations.

The Bureau for Remediation and Redevelopment Tracking System (BRRTS) on the Web is a searchable database containing information on the investigation and cleanup of potential and confirmed contamination to soil and groundwater in Wisconsin. The Remediation and Redevelopment Sites Map is a Geographical Information System (GIS) web-based mapping system that provides information about contaminated properties and other activities related to the investigation and cleanup of contaminated soil or groundwater in Wisconsin. Both databases are inter-linked through the WDNR's Contaminated Lands Environmental Action Network (CLEAN), which provides informational access to contaminated properties in Wisconsin. The proposed project areas were not included in the WDNR databases reviewed; however, adjacent areas were. WDNR files reviewed indicated petroleum contamination was detected over 600 feet from the proposed geothermal borehole field area during a 1998 investigation. Based on the concentrations of contaminants detected, groundwater flow direction, and clay soils at the Airport, the proposed project areas are unlikely to have been impacted.

If contamination was encountered in the proposed project areas, the project engineer would work with the WDNR to determine soil handling requirements based on type of contamination, contaminant concentrations, and the anticipated volume of material requiring special handling. Though encountering contamination is not anticipated, it is recommended that project plans and specifications include guidance if evidence of soil contamination is detected during construction activities. Project specifications may include a special provision describing notification procedures, excavation, loading, hauling, and disposing of contaminated soil.

The preliminary design of the proposed vertical closed loop heat exchange system would consist of 240 vertical boreholes. The boreholes would be approximately 400 feet deep. Within each borehole heat exchange piping would be grouted in place.

The boreholes would be installed by a Wisconsin licensed heat exchange driller. Prior to the start of drilling activities, the heat exchange driller would obtain a well notification permit from the WDNR. Construction of the proposed vertical closed loop heat exchange system, including required material characteristics is discussed under the Section 2.3, Geothermal Heating and Cooling System for the Appleton International Airport Passenger Terminal Expansion Project (Proposed Action Alternative).

The contractor would be required to dispose of solid waste generated by construction, that cannot be recycled, at a solid waste disposal facility.

Construction waste in the form of non-earthen materials would be recycled where possible. Non-earthen materials that cannot be recycled would be disposed of at a certified landfill site. Earthen construction spoil would be beneficially reused at the proposed topsoil stockpile location and the proposed clay/soil cutting fill location.

General construction activities are discussed under Section 4.5, Construction Impacts, of this Chapter. The Proposed Action alternative is not anticipated to substantially change current solid waste handling.

There are no substantial hazardous materials, pollution prevention or solid waste impacts anticipated with the Proposed Action. There are no hazardous materials, pollution prevention or solid waste impacts with the No Action alternative.

4.14 Historical, Architectural, Archeological, and Cultural Resources

Determination of an environmental impact of what a project might have to historic, architectural, archeological, or cultural resources is made under the guidance contained in the National Historic Preservation Act of 1966, as amended[65], and the Archaeological and Historic Preservation Act of 1974[66].

The National Historic Preservation Act established the Advisory Council on Historic Preservation to advise the President and the Congress on historic preservation matters, to recommend measures to coordinate federal historic preservation activities, and to comment on federal actions affecting properties included or eligible for inclusion in the National Register of Historic Places. Section 106 requires federal agencies to consider the effects of their undertakings on properties on or eligible for inclusion in the National Register of Historic Places. Compliance with section 106 requires consultation with the SHPO and/or the Tribal Historic Preservation Officer.

The Archaeological and Historic Preservation Act provides for the survey, recovery, and preservation of important scientific, pre-historical, historical, archeological, or paleontological data when such data may be destroyed or irreparably lost due to a federal, federally licensed, or federally funded project.

An APE is defined by 36 CFR 800.16 as being "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist." An undertaking has an effect on a historic property when the undertaking may alter characteristics that may qualify the property for inclusion in the National Register of Historic Places. Adverse effects include, but are not limited to:

- Physical destruction, damage, or alteration of all or part of the property;
- Alterations of a property that is not consistent with the standards for treatment of historic properties;
- Removal of the property from its historic location;
- Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;
- Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's important historic features;

[65] National Historic Preservation Act of 1966, as amended: https://www.achp.gov/digital-library-section-106-landing/national-historic-preservation-act

[66] Archaeological and Historic Preservation Act: https://dahp.wa.gov/sites/default/files/Moss_Bennett_Act_ArchHistPres.pdf

- Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of the property; and
- Transfer lease, or sale of the property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic importance.

The definition of the APE for the proposed project involved the construction areas and adjacent project areas. Delineation of the APE involved the following considerations:

- The physical construction of the proposed project would be located within the existing Airport boundaries.
- Terrain, vegetation, and intervening buildings around the Airport would remain.

The determination of the proposed project's APE and the evaluation of listed or eligible properties are subject to review and evaluation by the SHPO.

For this environmental assessment, reviews were made to determine if any properties in or eligible for inclusion in the Nation Register of Historic Places were within the APE. **Figure 4-4** shows the proposed project areas on the Airport and the archaeological and historic property study areas performed on and adjacent to the Airport.

In 2003[67] and 2021,[68] Phase I Archaeological Reconnaissance Surveys were conducted at the Airport that included the areas of the proposed project. There are no known archaeological sites in the proposed project area and no new archaeological sites were found.

In 2021,[69] a Phase I Architectural Historic Reconnaissance Survey was conducted at the Airport that included the areas of the proposed project. No Adverse Effects to historic properties was the conclusion of the survey.

Preliminary coordination letters[70] were sent out to Native American tribes to familiarize them with the proposed passenger terminal and apron expansions and to solicit their interest and

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[67] Phase I Archaeological Survey of Outagamie County Regional Airport (AIP-26), AVD Archaeological Services, Inc., May 7, 2003.

[68] Phase I Archaeological Reconnaissance Survey, Appleton International Airport (ATW) Apron and Concourse Expansion Project, OMNNI Associates, A Westwood Company, April 29, 2021.

[69] Phase I Architectural History Reconnaissance Survey, Appleton International Airport (ATW) Apron and Concourse Expansion Project, OMNNI Associates, A Westwood Company, April 29, 2021.

[70] Footnote added: Preliminary coordination letters were sent out to Native American Tribes during the CatEx for the Apron/Passenger Terminal Expansion project, which included the geothermal borehole field. The CatEx did not include the proposed topsoil stockpile location or the proposed clay/soil cutting fill location; however, these areas were included in Archaeological Reconnaissance Surveys and Architectural Historic Reconnaissance Surveys. Discussions took place between WisDOT Bureau of Aeronautics staff and Cultural Resources staff. WisDOT-Cultural Resources staff did not identify additional Native American Tribe correspondence as a necessary step in the process since the APE was covered. A determination was made that no eligible properties are within the APE. The

concerns regarding historical, archeological, and cultural resources. Native American preliminary coordination letters are included in Appendix 2.

A preliminary coordination letter was sent out to the Outagamie County Historical Society to familiarize them with the proposed passenger terminal and apron expansions and to solicit their interest and concerns regarding historical, architectural, archeological, and cultural resources. The Outagamie County Historical Society preliminary coordination letter is included in Appendix 2.

The above investigations were submitted to the SHPO. The SHPO concurred that there are no properties listed in or eligible for the National Register of Historic Places within the APE for the proposed project. A copy of the SHPO concurrence is included in Appendix 4.

There are no anticipated impacts with either the Proposed Action alternative or the No Action alternative for historical, architectural, archeological, and cultural resources.

4.15 Light Emissions and Visual Effects

Changes in lighting associated with airport operations need to be considered to determine if an annoyance is created in the vicinity of the installation. Airport lighting does not generally result in substantial impacts unless a high intensity strobe light would shine directly into people's homes.

Lighting requirements for the proposed geothermal system are anticipated to be very minimal or non-existent. Lights may be required during the drilling operations of the proposed geothermal borehole field, but after the vertical heat exchange components are installed, they would be all underground. The proposed topsoil stockpile location and the proposed clay/soil cutting fill location are not anticipated to require lighting.

Visual, or aesthetic, effects are inherently more difficult to define and assess because they involve subjectivity. Visual effects deal broadly with the extent to which airport development contrasts with the existing environment, architecture, historic or cultural setting, or land use planning.

The proposed geothermal borehole field would be restored to a grassy area after construction. The proposed topsoil stockpile would be temporary, not a permanent location for the excess topsoil. Stockpiled topsoil would be seeded to prevent erosion. The proposed clay/soil cutting fill location would be restored to a grassy area after construction and is anticipated to be used for additional general aviation requirements including grass parking during events and additional hanger space when the need arises.

There are no substantial impacts to light emissions or visual effects with the Proposed Action alternative. There are no impacts to light emissions or visual effects with the No Action alternative.

WisDOT Bureau of Aeronautics, WisDOT Cultural Resources, and SHPO correspondences are included in Appendix 4.

4.16 Natural Resources and Energy Supply

The Proposed Action alternative would require some increased power for the heating and cooling of the new passenger terminal addition. Reference **Table 2-1** Existing and Proposed Heating and Cooling System Comparison, in Section 2.3. The increased power requirements are not anticipated to have a measurable effect on local supplies. An environmental review of the passenger terminal addition was documented in a categorical exclusion[71] report. The environmental review was determined to be compliant with FAA Order 1050.1F by the FAA on February 28, 2022.

The Proposed Action alternative would not increase consumption of fuel by aircraft due to changes in ground movements or run-up times; by aircraft due to changes in flight patterns; or by ground vehicles due to changes in movement patterns for Airport service or other vehicles.

There would be additional energy consumption during construction if the Proposed Action alternative were built. The additional energy consumption would primarily be the fuel required for construction. This energy consumption is not anticipated to be substantial or have measurable effects on local supplies.

Mineral sources, such as sand, aggregate, bentonite, and cement, used for the construction of the proposed geothermal system are not anticipated to require new pits or put a limit on existing resources. The Proposed Action alternative does not require the use of unusual materials or those in short supply.

The Proposed Action alternative would not have a substantial impact on the production or consumption of energy. Construction materials required are readily available. The No Action alternative would not impact natural resources or energy supplies.

4.17 Noise

Under the authority of Aviation Safety and Noise Abatement Act of 1979, as amended, the Federal Aviation Regulation (FAR) Part 150 (now the Code of Federal Regulation 14 CFR Part 150) was developed. This regulation outlines procedures, standards, and methodology for airports participating in the voluntary development of noise exposure maps and noise compatibility programs.

Noise exposure maps are graphic representations of an airport, the surrounding community, and the annual noise level contours expressed in a day-night average sound level (DNL). DNL is the federal standard for measuring average sound impacts around airports. The projected Airport noise exposure map for 2020, from the 2003 Airport Master Plan, is shown in **Figure 4-5**.

If the proposed geothermal system were built, there would be an increase in the noise level in the area resulting from the construction. Appendix 5 contains an explanation of ambient sound travel. Noise impacts during the construction are expected to be short duration.

[71] Reference categorical exclusion titled: ATW1007 – SAP 91 Concourse and Apron Expansion

Construction activities relating to noise are discussed under the Section 4.5, Construction Impacts, of this Chapter.

Noise sources during operation of the geothermal system would be from mechanical equipment, which includes pumps circulating heat transfer fluid from the vertical heat exchange field to the passenger terminal building and heat pumps. The mechanical equipment would be located in the mechanical room, which is located in the basement of the passenger terminal building and would not contribute substantially to ambient noise levels.

There would be a noise impact to the Proposed Action alternative. The Proposed Action alternative would increase noise levels during the construction. Construction noise levels are expected to be short duration and localized. Construction noise levels are not expected to be louder than aviation operations. Operational noises would be similar to the current HVAC system. There would be no impacts to noise contours. The No Action alternative would not have an impact on noise.

4.18 Secondary (Induced) Impacts

Major airport development projects may have induced or secondary impacts on surrounding communities including shifts in patterns in population movement and growth, public service demands, and changes in business and economic activity.

The community and Airport would benefit from a passenger terminal geothermal heating and cooling system that the Proposed Action alternative would provide through lower energy use and lower carbon dioxide equivalent per year emissions compared to conventional systems.

As discussed in other sections of this chapter, the Proposed Action alternative would not have a substantial adverse impact on noise, land use, or social factors. There are no anticipated changes to the population, public service demands, or adverse impacts to the businesses and economy of the surrounding community.

There are no secondary (induced) impacts anticipated with either the Proposed Action alternative or the No Action alternative.

4.19 Socioeconomic Impacts, Environmental Justice, and Children's Environmental Health and Safety Risks

Social impacts are generally associated with relocation activities or other community disruptions. Community disruptions include altering surface transportation patterns, dividing or disrupting established communities, disrupting orderly planned development, or creating an appreciable change in employment.

Since the Proposed Action alternative would be constructed within Airport property, there is no anticipated relocation of residences or businesses and no anticipated disruption to established communities or planned development.

Executive Order 12898[72] requires federal agencies to identify community issues of concern, particularly those issues relating to discussions that may have an impact on low-income or minority populations. The Executive Order states that, to the extent practicable and permitted by law, neither minority or low-income populations may receive disproportionately high or adverse impacts as a result of a proposed project. It also requires that representatives of any low-income or minority populations that could be affected by the project in the community be given the opportunity to be included in the impact assessment and public involvement process.

The Department of Transportation Order 5610.2(a) (Actions to Address Environmental Justice in Minority Populations and Low-Income Populations)[73] sets forth the Department of Transportation policy to consider environmental justice principles in programs, policies, and activities. The Order describes how the objectives of environmental justice will be integrated into planning and programming, rulemaking, and policy formulation.

According to the U.S. Census Bureau, Census 2020, the Village of Greenville, which the Airport property is located in, had a total population of 12,687. The percentage of the non-white population in the Village of Greenville was 8.1%. The Village of Greenville had a lower minority population than Outagamie County, which had a total population of 190,705, with a non-white population of 14.0%. The State of Wisconsin, which had a total population of 5,893,718, had a non-white population of 19.6%. The data demonstrates that the general project area does not include a disproportionate percentage of ethnic minorities.

According to the American Community Survey estimates, for 2022, the Village of Greenville had a lower percentage of its individuals living below the poverty level (1.6%) than either Outagamie County (7.3%) or the State of Wisconsin (10.7%). The data demonstrates that the general project area does not include a disproportionate percentage of low income populations.

Buildings and structures adjacent to the Airport property were comparable to those of the surrounding communities. The proposed project is confined to Airport property.

Executive Order 13045[74] requires federal agencies, as appropriate and consistent with the agencies mission, to make it a high priority to identify and assess environmental health risks and safety risks disproportionately affecting children. Agencies are encouraged to participate in implementation of the Executive Order by ensuring their policies, programs, activities, and standards address disproportionate risks to children resulting from environmental health risks or safety risks.

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[72] Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations.

[73] https://www.transportation.gov/transportation-policy/environmental-justice/department-transportation-order-56102a

[74] Executive Order 13045: Protection of Children from Environmental Health Risks and Safety Risks.

Environmental health risks and safety risks include risks to health or to safety that are attributable to products or substances that a child is likely to come in contact with or ingest, such as air, food, drinking water, recreational waters, soil, or products they might be exposed to. Given the location and nature of the project, the Proposed Action alternative should not have an impact on environmental health and safety risks for children.

The public involvement process described in Chapter 6, Public Coordination and Participation, allows all residents and population groups in the study area the opportunity to participate. The public coordination and participation process does not exclude any persons because of income, race, color, religion, national origin, sex, age, or handicap.

This document is in compliance with the United States Department of Transportation and FAA policies to determine whether a proposed project would have induced socioeconomic impacts or any other adverse impacts on minority or low-income groups; it meets the requirements of Executive Order 12898 on environmental justice; and it meets the requirements of Executive Order 13045 on children's environmental health and safety risks.

Neither minority nor low-income populations would receive disproportionately high or adverse impacts as a result of Proposed Action alternative or the No Action alternative. There are no impacts on environmental health and safety risks for children anticipated with either the Proposed Action alternative or the No Action alternative. The environmental and economic benefits of the Proposed Action would not be realized with the No Action alternative.

4.20 Water Quality

The Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977, provides authority to establish water quality standards, control discharges into surface and subsurface waters, develop waste treatment management plans and practices, and issue permits for discharges and for dredged or fill material.

Short-term soil erosion and stormwater quality impacts could result from construction activities. The land is currently a mowed grass field and disturbed areas with no structures on them. The geothermal borehole field would be restored to a mowed grass field. The topsoil stockpile would eventually be restored to a mowed grass area as the topsoil is repurposed. The clay/soil cutting fill location would become a mowed grass area and eventually used for general aviation hangars.

Stormwater on the proposed project areas currently consists of topography sheet flow, which eventually is picked up by drainage swales, ditches, and a dry pond or biofilter before entering an intermittent stream. **Figure 4-6** is an aerial view of the proposed project areas with the 24K Hydro Waterbodies (lakes)/Flowline (rivers, streams) map layer overlaid. Construction of the proposed geothermal system would comply with the requirements of Chapters NR 151 Runoff Management and NR 216 Storm Water Discharge Permits of the Wisconsin Administrative Code.

The WDNR would be provided a grading plan indicating pre-construction grade and final grade. The WDNR would also be provided an erosion control implementation plan (ECIP) and a storm water management plan for the project.

Construction documents would include erosion control requirements to maintain water quality. Techniques described in WisDOT's Facilities Development Manual and the WDNR's Storm Water Construction Technical Standards would be implemented to prevent erosion and minimize siltation to drainage ways. These techniques may include the use of temporary and permanent sediment traps, silt fences, sodding, ditch checks, erosion mats, temporary and permanent seeding and other means to prevent erosion and trap sediment. During construction, by implementing erosion control measures as specified in the contract documents, impacts to water quality would be minimized.

The WisDOT 2024 Standard Specifications for Highway and Structure Construction, would be part of the contract document for airport construction. Section 107.18, Environmental Protection, paragraphs (1) and (3) state that the contractor shall:

> *Comply with all applicable federal, state, and local laws and regulations that control the prevention of pollution of the environment including those related to the introduction or spread of invasive species or pathogens in waterways.*
>
> *Take all necessary precautions to prevent pollution of streams, lakes, wetlands, and reservoirs with fuels, oils, bitumens, calcium chloride, magnesium chloride, paint, or other harmful materials. Conduct and schedule work operations to avoid or minimize siltation of streams, lakes, and reservoirs. Protect drainage ways, culverts, and drainage structures from debris caused by a contractor operation.*

The boreholes would be installed by a Wisconsin licensed heat exchange driller. The heat exchange driller would submit the Closed Loop Heat Exchange Well Application (Form 3300-255) to the WDNR. Prior to the start of drilling activities, the heat exchange driller would obtain a well notification permit from the WDNR.

The WDNR would require the boreholes be drilled using mud-rotary techniques, which seals the borehole during the drilling process. The boreholes would also be sealed with a cementitious grout product.

Based on the above, the Proposed Action alternative should not have substantial adverse impacts on water quality. There are no water quality impacts anticipated with the No Action alternative.

4.21 Wetlands

Executive Order 11990, Order DOT 5660.1A, the Rivers and Harbors Act of 1899, and the Clean Water Act address activities in wetlands.

Executive Order 11990, Protection of Wetlands, is an order given by President Carter in 1977 to avoid the adverse impacts associated with the destruction or modification of wetlands.

The U.S. Department of Transportation (DOT) developed and issued DOT Order 5660.1A, Preservation of the Nation's Wetlands to provide guidance to DOT agencies regarding their actions in wetlands. The DOT Order governs FAA's actions. The Order defines wetlands as:

"Lowlands covered with shallow and sometimes temporary or intermittent waters. This includes, but is not limited to, swamps, marshes, bogs, sloughs, potholes, wet meadows,

river overflows, tidal overflows, estuarine areas, and shallow lakes and ponds with emergent vegetation. Areas covered with water for such a short time that there is no effect on moist-soil vegetation are not included in the definition, nor are the permanent waters of streams, reservoirs, and deep lakes. The wetlands ecosystem includes those areas which affect or are affected by the wetland area itself; e.g., adjacent uplands or regions up and down stream from the wetland or by disturbing the water table of the area in which the wetland lies."

Section 10 of the Rivers and Harbors Act of 1899 requires approval from the United States Army Corps of Engineers prior to placing obstructions or excavating and/or depositing materials in navigable waters.

The United States Army Corps of Engineers has jurisdiction and regulates the discharge of dredged and fill material into the waters of the United States, including adjacent wetlands, under Section 404 of the Clean Water Act. The WDNR has jurisdiction of isolated wetlands, which are outside of the United States Army Corps of Engineers' jurisdiction under Section 281.36 of the Wisconsin Statues.

Wetland delineations were performed in and adjacent to the proposed topsoil stockpile location and the proposed clay/soil cutting fill location. The proposed geothermal borehole field location area was field assessed for wetlands.

A wetland delineation was performed in October 2016, as part of the ARFF training facility project. The delineation identified 2.57 acres of wetlands, but no wetlands were identified in the footprint of the proposed clay/soil cutting fill location. A copy of the wetland delineation report was provided to the United States Army Corps of Engineers and the WDNR[75]. A meeting between OMNNI's wetland delineator and the WDNR took place at the Airport on May 17, 2017, to review the ARFF wetland delineation. The WDNR concurred with the lines of the wetland delineation.

A second wetland delineation was performed in October of 2021 as part of the East Service Road project[76]. This delineation was adjacent to both the proposed topsoil stockpile location and the proposed clay/soil cutting fill location. The delineation identified 0.280 acre of wetland, but no wetlands were identified in the footprint of the proposed topsoil stockpile location or the proposed clay/soil cutting fill location. A copy of the wetland delineation report was provided to the United States Army Corps of Engineers and the WDNR. The WDNR sent the concurrence letter on February 15, 2022.

A third wetland delineation was performed in October 2022, which included the footprint area of the proposed topsoil stockpile location. The delineation identified 1.375 acres of wetlands, but no wetlands were identified in the footprint of the proposed topsoil stockpile

[75] Wetland Delineation Report, Appleton International Airport, Live Burn Facility, dated November 16, 2016, prepared by OMNNI Associates, Inc.

[76] Wetland Delineation Report, East Service Road, dated January 20, 2022, prepared by Westwood Infrastructure, Inc.

location. A copy of the wetland delineation report[77] was provided to the United States Army Corps of Engineers and the WDNR.

The proposed geothermal borehole field location area near the passenger terminal was field assessed for wetlands on October 13, 2021, as part of the Concourse and Terminal Expansion project. No wetlands were found during the field assessment. No wetland or wetland indicators show up on Surface Water Data Viewer or National Wetlands Inventory.

The proposed topsoil stockpile location and the proposed clay/soil cutting fill location do not impact any of the wetlands delineated. However, the proposed topsoil stockpile location and the proposed clay/soil cutting fill location would be located near wetlands. Silt fence, erosion control logs and/or other BMPs would be installed to protect the wetlands. General construction activities are discussed under Section 4.5, Construction Impacts, of this Chapter.

No wetlands were found within the proposed geothermal borehole field location. **Figure 4-7** shows the delineated wetlands near the proposed project areas. The proposed geothermal system and supporting areas were designed to avoid adverse impacts to aquatic resources, including wetlands. If wetlands would be impacted, the impacts must be minimized to the greatest extent practicable. The WNDR provides guidance for wetland impacts in the DNR Initial Review correspondence, which can be referenced in Appendix 2.

There are no wetland impacts anticipated with either the Proposed Action alternative or the No Action alternative.

4.22 Wild and Scenic Rivers

The Wild and Scenic Rivers Act[78] declared "certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations." There are no Wild and Scenic River designations in the proximity of the Airport. Therefore, the provisions of the Wild and Scenic Rivers Act do not apply.

A presidential directive[79] requires federal agencies, as part of their planning and environmental review process, to avoid or mitigate adverse effects on rivers identified in the

[77] Wetland Delineation Report, Appleton International Airport, Waste Areas, dated November 28, 2022, prepared by Westwood Infrastructure, Inc.

[78] Wild and Scenic Rivers: https://www.fws.gov/story/wild-and-scenic-rivers#:~:text=The%20Wild%20and%20Scenic%20Rivers%20Act%20of%201968%20established%20the,of%20present%20and%20future%20generations.

[79] Presidential Directive: https://www.nps.gov/subjects/rivers/upload/Presidental-Memorandum-for-Heads-of-Departments-and-Agencies_508-2.pdf

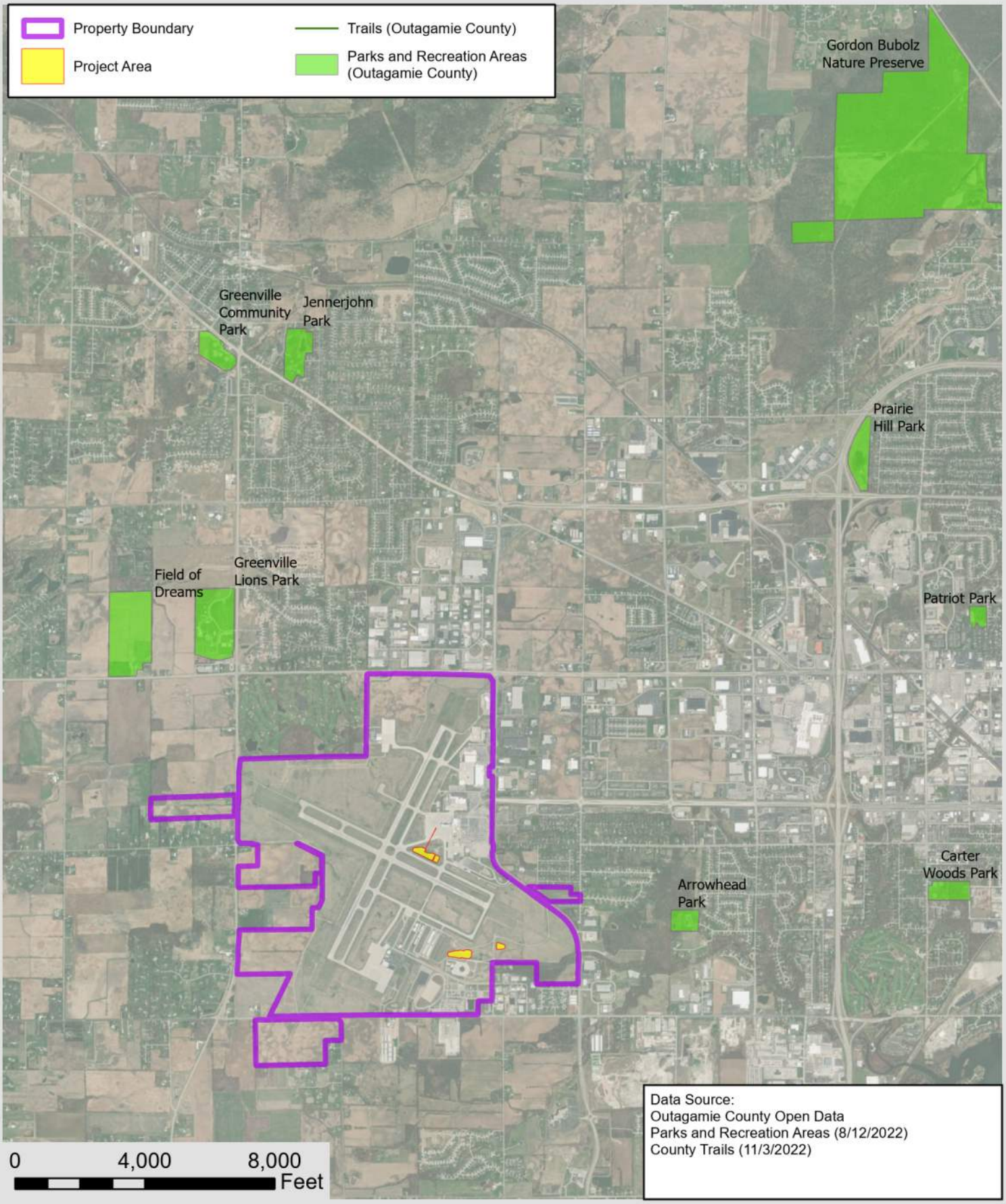
Nationwide Rivers Inventory (NRI)[80]. The National Park Service has compiled and maintains the NRI, a register of river segments that potentially qualify as national wild, scenic, or recreational river areas. There are no rivers on the NRI in the proximity of the Airport.

Chapter NR 102, Wisconsin Administrative Code, Water Quality Standards for Wisconsin Surface Waters[81] establishes water quality standards for surface waters of the state. Section NR 102.10 of the Wisconsin Administrative Code lists outstanding resource waters. Section NR 102.11 of the Wisconsin Administrative Code lists exceptional resource waters. There are no state designated outstanding resource waters or exceptional resource waters in the Airport area.

Figure 4-8 shows the relative distance between designated resource waters and the proposed project location. There are no anticipated river impacts with either the Proposed Action alternative or the No Action alternative.

[80] Nationwide Rivers Inventory: https://www.rivers.gov/nri#:~:text=Under%20the%20Wild%20and%20Scenic,adversely%20affect%20NRI%20river%20segments.

[81] Chapter NR 102, Wisconsin Administrative Code, Water Quality Standards for Wisconsin Surface Waters (NR102): http://docs.legis.wisconsin.gov/code/admin_code/nr/100/102.pdf.



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1 Systems Drive
Appleton, WI 54914
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GEOTHERMAL ENVIRONMENTAL ASSESSMENT

PARKS AND TRAILS MAP

APPLETON INTERNATIONAL AIRPORT
VILLAGE OF GREENVILLE, OUTAGAMIE COUNTY, WISCONSIN

Project Manager:		SCALE:	1 in = 4,000 ft
Project Engineer:			
Drawn By:	JCW	PROJECT NO.	**R3001381.00**
Checked By:	BDW		
Date:	1/31/2024	FIGURE NO.	**4-1**

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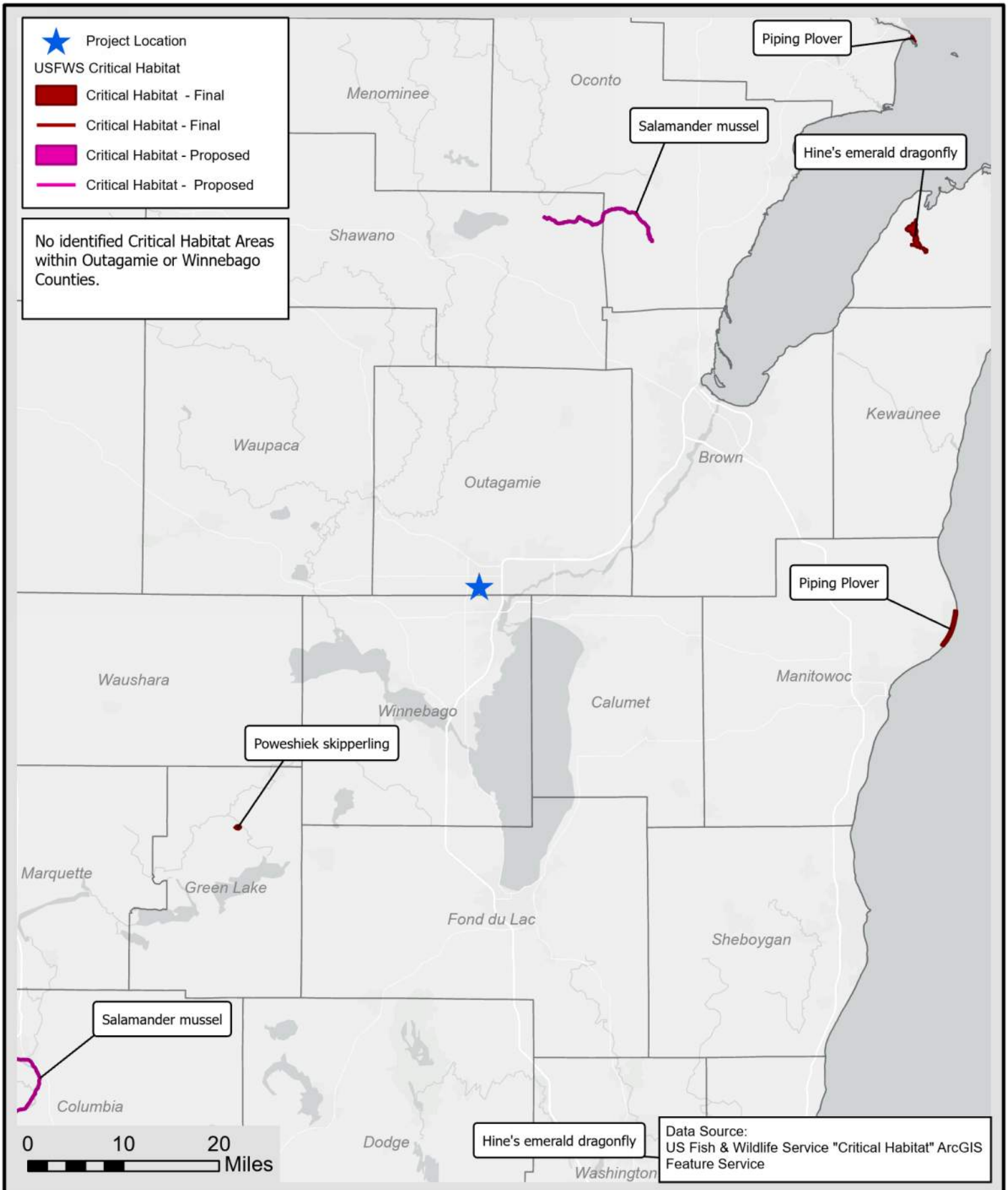

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GEOTHERMAL ENVIRONMENTAL ASSESSMENT

CRITICAL HABITAT AREAS

APPLETON INTERNATIONAL AIRPORT
VILLAGE OF GREENVILLE, OUTAGAMIE COUNTY, WISCONSIN

Project Manager:		SCALE: 1 in = 69,905 ft
Project Engineer:		
Drawn By:	JCW	PROJECT NO. R3001381.00
Checked By:	BDW	
Date:	1/31/2024	FIGURE NO. 4-2

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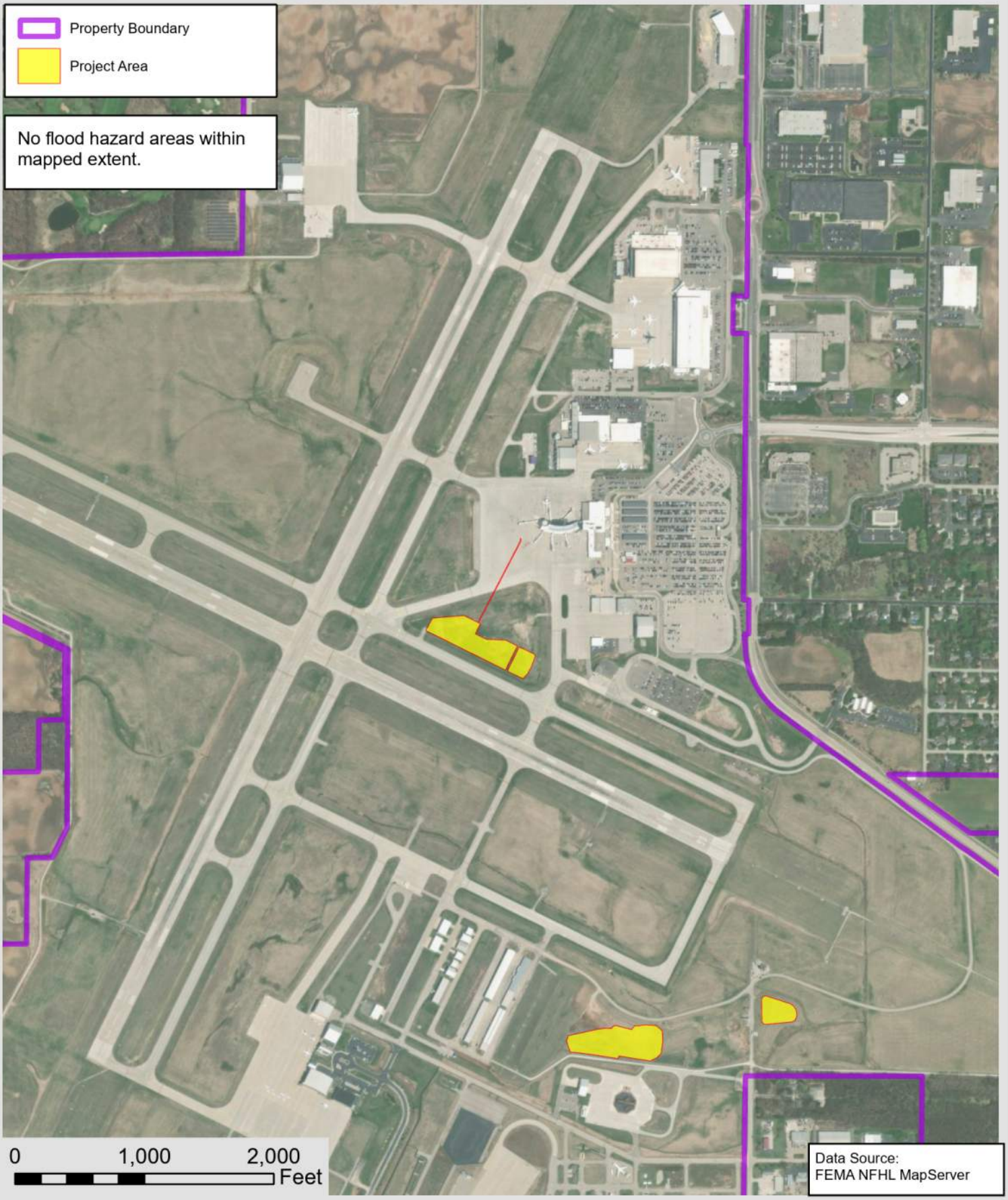

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GEOTHERMAL ENVIRONMENTAL ASSESSMENT

FLOODPLAIN MAP

APPLETON INTERNATIONAL AIRPORT
VILLAGE OF GREENVILLE, OUTAGAMIE COUNTY, WISCONSIN

Project Manager:		SCALE:
Project Engineer:		1 in = 1,000 ft
Drawn By:	JCW	PROJECT NO.
Checked By:	BDW	**R3001381.00**
Date:	1/31/2024	FIGURE NO. **4-3**

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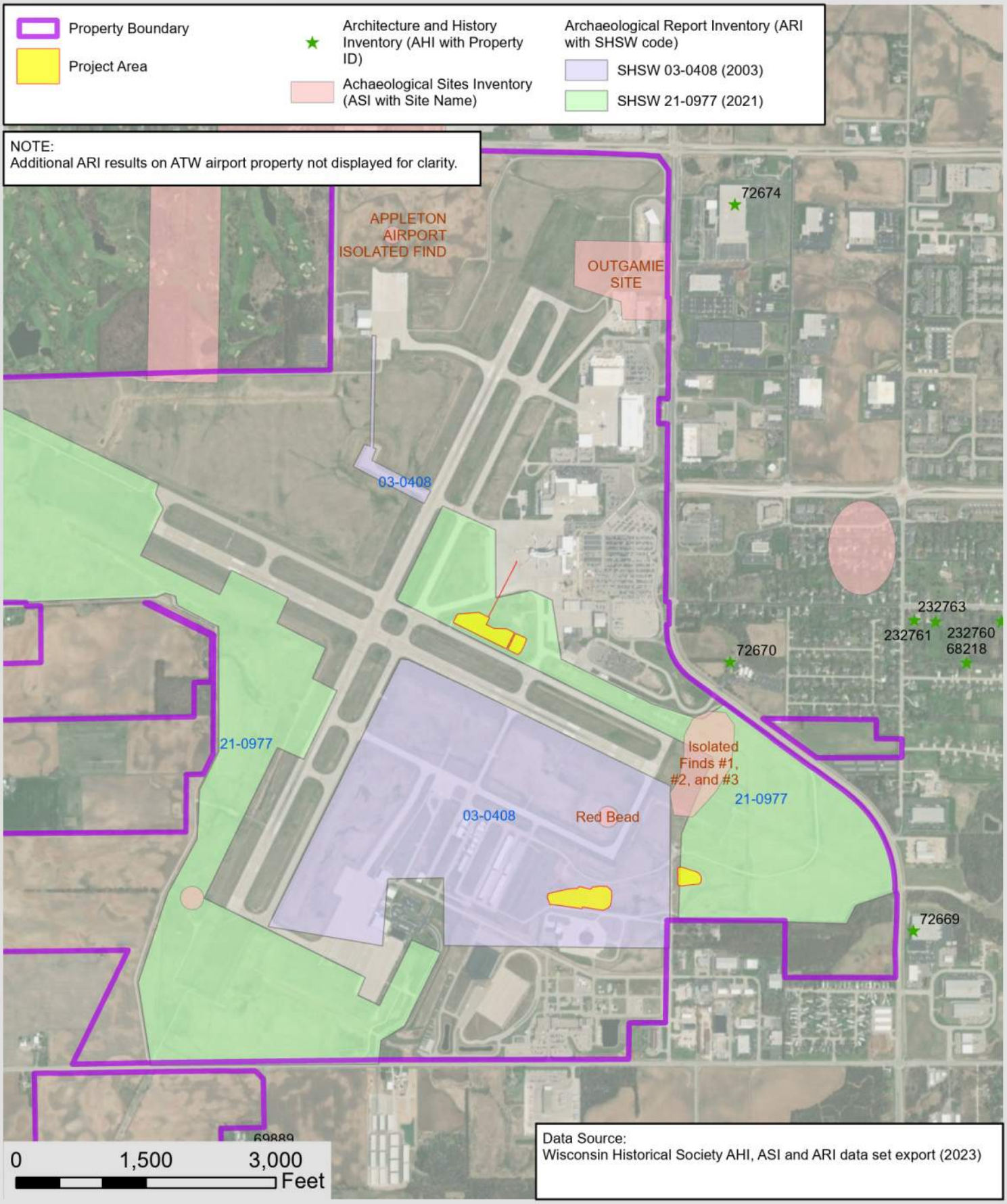

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GEOTHERMAL ENVIRONMENTAL ASSESSMENT

HISTORICAL SITES MAP

APPLETON INTERNATIONAL AIRPORT
VILLAGE OF GREENVILLE, OUTAGAMIE COUNTY, WISCONSIN

Project Manager:		SCALE: 1 in = 1,500 ft
Project Engineer:		
Drawn By:	JCW	PROJECT NO. R3001381.00
Checked By:	BDW	
Date:	1/31/2024	FIGURE NO. 4-4

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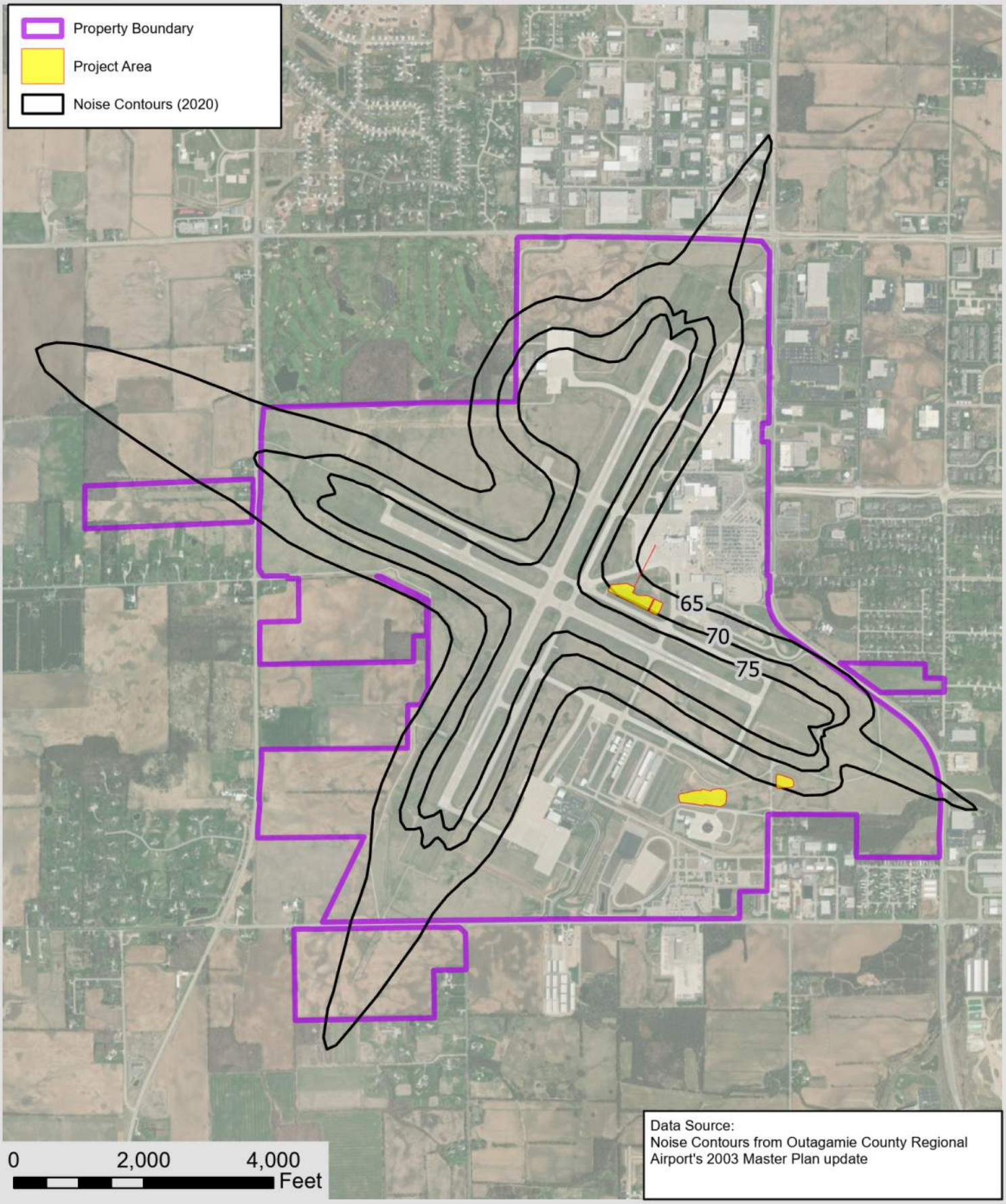

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GEOTHERMAL ENVIRONMENTAL ASSESSMENT

NOISE EXPOSURE MAP

APPLETON INTERNATIONAL AIRPORT
VILLAGE OF GREENVILLE, OUTAGAMIE COUNTY, WISCONSIN

Project Manager:		SCALE: 1 in = 2,000 ft
Project Engineer:		
Drawn By:	JCW	PROJECT NO. **R3001381.00**
Checked By:	BDW	
Date:	1/31/2024	FIGURE NO. **4-5**

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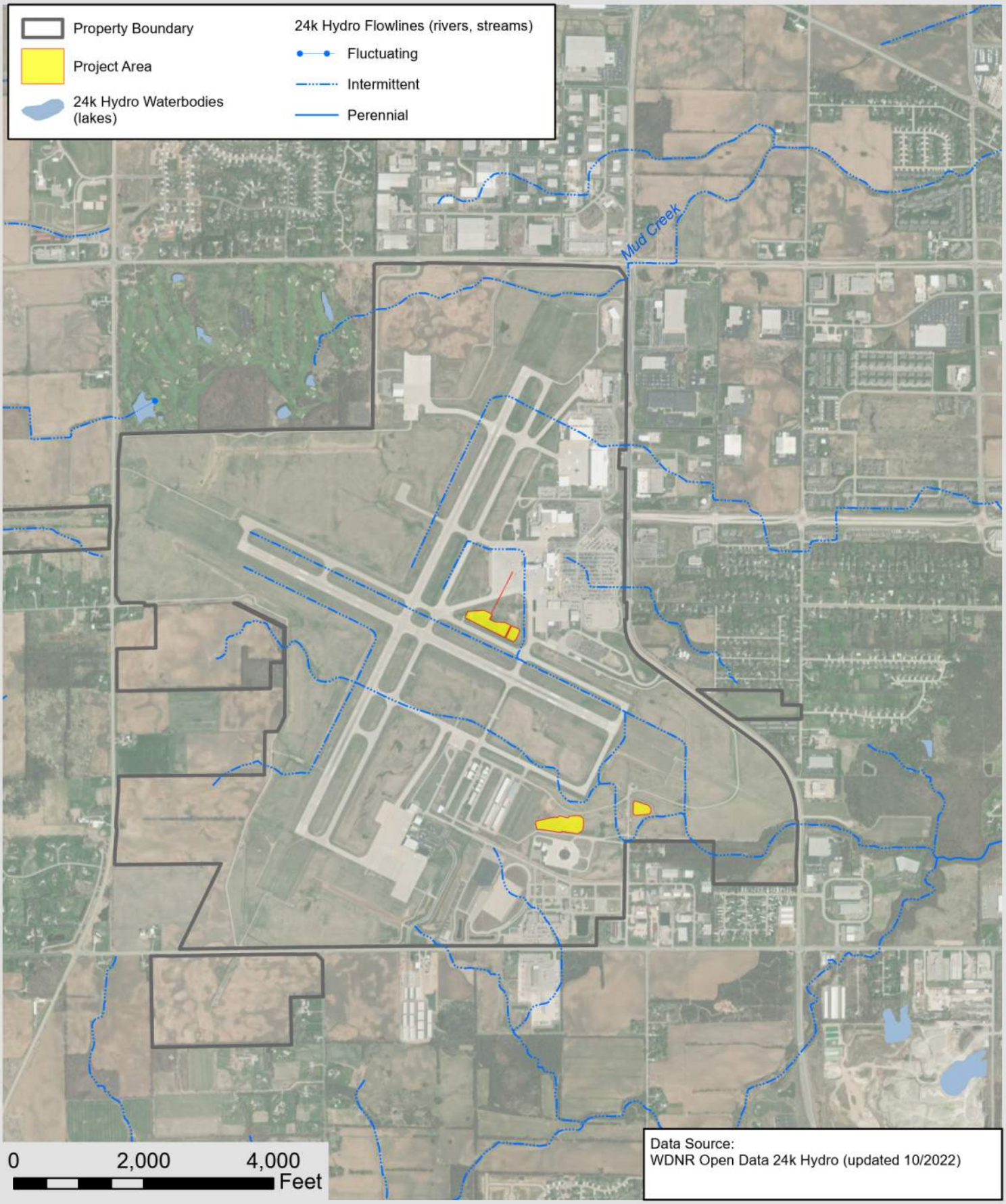

Westwood

1 Systems Drive
Appleton, WI 54914
(920) 735-6900
www.westwoodps.com

N W E S

GEOTHERMAL ENVIRONMENTAL ASSESSMENT

WATERWAY MAP (24K HYDRO)

APPLETON INTERNATIONAL AIRPORT
VILLAGE OF GREENVILLE, OUTAGAMIE COUNTY, WISCONSIN

Project Manager:		SCALE: 1 in = 2,000 ft
Project Engineer:		
Drawn By:	JCW	PROJECT NO. **R3001381.00**
Checked By:	BDW	
Date:	1/31/2024	FIGURE NO. **4-6**

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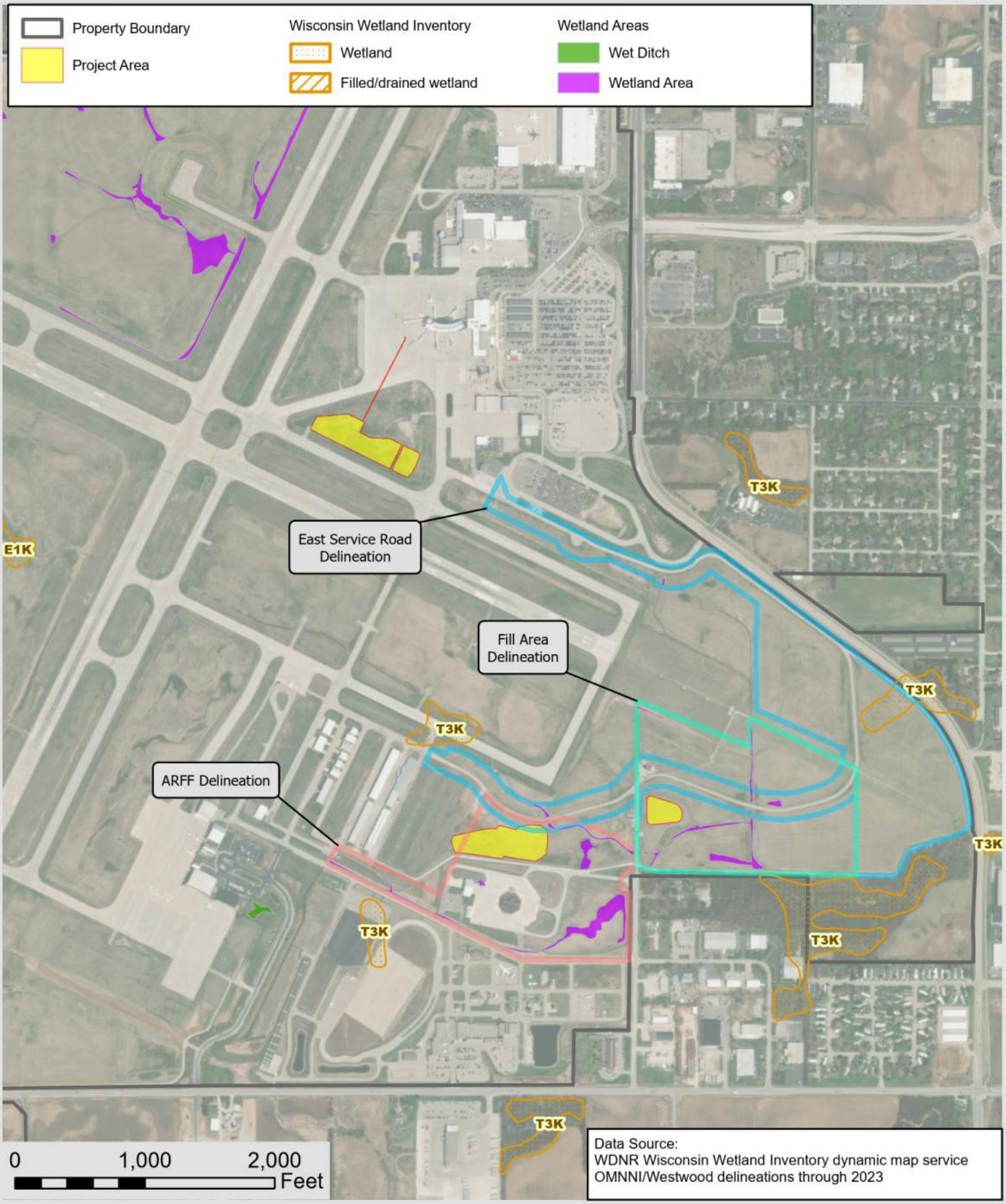

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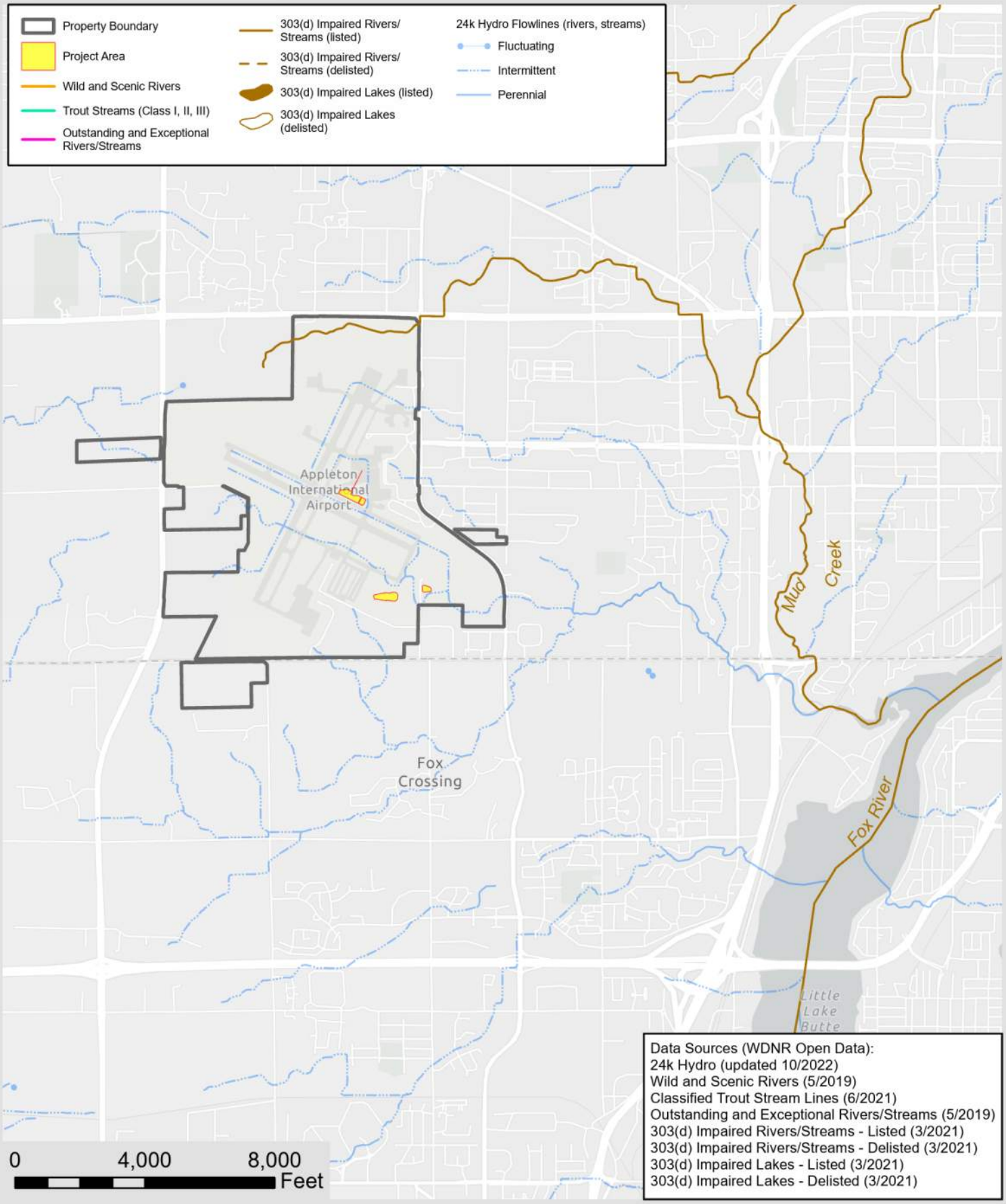
GEOTHERMAL ENVIRONMENTAL ASSESSMENT

WETLAND MAP

APPLETON INTERNATIONAL AIRPORT
VILLAGE OF GREENVILLE, OUTAGAMIE COUNTY, WISCONSIN

Project Manager:		SCALE:	1 in = 1,000 ft
Project Engineer:			
Drawn By:	JCW	PROJECT NO.	R3001381.00
Checked By:	BDW		
Date:	1/31/2024	FIGURE NO.	4-7

F:\TR\JOBS\E2422A21 ATW Terminal Apron\Environmental\2023 Geothermal EA\GIS\EnvAssessmentMaps.aprx [Wetlands Map]
Printed: jcweis 1/31/2024 5:06 PM



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Appleton, WI 54914
(920) 735-6900
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N W E S

GEOTHERMAL ENVIRONMENTAL ASSESSMENT

DESIGNATED RESOURCE WATERS

APPLETON INTERNATIONAL AIRPORT
VILLAGE OF GREENVILLE, OUTAGAMIE COUNTY, WISCONSIN

Project Manager:		SCALE: 1 in = 4,000 ft
Project Engineer:		
Drawn By:	JCW	PROJECT NO. R3001381.00
Checked By:	BDW	
Date:	1/31/2024	FIGURE NO. 4-8

F:\TR\JOBS\E2422A21 ATW Terminal Apron\Environmental\2023 Geothermal EA\GIS\EnvAssessmentMaps.aprx [Designated Reource Waters Map]
Printed: jcweis 1/31/2024 8:03 AM

CHAPTER 5 - OTHER PUBLIC AND ENVIRONMENTAL CONSIDERATIONS

This chapter discusses the environmental consequences and other considerations that were not covered by the categories discussed in Chapter 4. The following environmental consequences and other considerations are considered as they pertain to the Proposed Action: possible conflicts with land use plans, policies, and controls; consistency with approved State or local plans; mitigation to avoid environmental impacts; degree of controversy on environmental grounds; and coordination with public agencies and State and local officials.

5.1 Possible Conflicts With Land Use Plans, Policies, and Controls

The Proposed Action has no known conflicts with Federal, State, or local land use plans. The proposed project is consistent with the Airport Master Plan and existing airport zoning.

5.2 Consistency With Approved State or Local Plans

There are no known state or local plans with which the proposed project would be inconsistent. The proposed project would occur on Airport property and would not substantially impact resources outside the Airport boundary. The proposed project is consistent with the Wisconsin State Airport System Plan 2030[82], the Airport's Sustainable Airport Master Plan[83], the Village of Greenville Comprehensive Plan 2040[84], and the Outagamie County Comprehensive Plan[85].

5.3 Mitigation To Avoid Environmental Impacts

Where appropriate, mitigation measures are included in the discussion of the specific environmental impact categories.

5.4 Degree Of Controversy On Environmental Grounds

Input was requested during the development of the Preliminary Environmental Assessment from Federal, State, and local agencies and officials to identify controversial actions. The Proposed Action is not expected to be substantially controversial on environmental grounds.

---

[82] Wisconsin State Airport System Plan 2030: http://wisconsindot.gov/Pages/projects/multimodal/sasp/air2030-chap.aspx

[83] Sustainable Airport Master Plan: https://www.faa.gov/sites/faa.gov/files/airports/environmental/sustainability/outagamie-airport-sustainability-master-plan.pdf

[84] Town of Greenville Comprehensive Plan 2040: https://www.ecwrpc.org/wp-content/uploads/2019/10/Greenville2040CompPlan.pdf

[85] Outagamie County Comprehensive Plan: http://www.outagamie.org/government/departments-a-e/development-and-land-services/comprehensive-plan

5.5 Coordination With Public Agencies and State and Local Officials

Preliminary coordination letters and responses are provided in Appendix 2. Public coordination and participation activities are described in Chapter 6.

In addition to the approvals discussed in this document, additional permits that may be necessary for project implementation are listed below:

- WDNR – Letter of Concurrence, Transportation Construction General Permit (Erosion Control Plan and Stormwater Management Plan), WDNR Final Concurrence, Erosion Control Implementation Plan
- Federal Aviation Administration – FAA Form 7460-1 Obstruction Evaluation/Airport Airspace Analysis, buildings and cranes permit.

CHAPTER 6 - PUBLIC COORDINATION AND PARTICIPATION

The public involvement process described in this chapter discusses community involvement activities, and coordination with state and federal review agencies and other interest groups during the development and evaluation of alternatives and preparation of the Environmental Assessment. The public involvement process was open to all residents and population groups in the study area, and did not exclude any persons because of income, race, color, religion, national origin, sex, age, or handicap. The following is a summary of these activities.

6.1 Public Information/Input

The passenger terminal expansion, which has included the proposed geothermal heating and cooling system, has been discussed during County Board meetings and County Airport Committee meetings, which are open to the public. The Airport has held advisory group meetings on the passenger terminal expansion. The Airport conducted sustainability surveys with passengers, Technical Advisory Group, and other stakeholders as part of the sustainable master plan processes. Public Hearings have taken place on the terminal expansion project.

Copies of the Preliminary Environmental Assessment were provided to agencies/organizations and made available to the public at the Airport, the Outagamie County Administration office, Appleton Public Library, and WisDOT BOA office. The Preliminary Environmental Assessment was also available on the project website. On May 14, 2024, a Notice of Availability of a Preliminary Environmental Assessment and Notice of Opportunity for a Public Hearing was published in the Appleton Post-Crescent newspaper for the proposed project. No requests for a public hearing were received and no public hearing was held. Additional information on the Preliminary Environmental Assessment distribution, comments received, responses to the comments, and a copy of the legal notice that appeared in the Appleton Post-Crescent, can be found in Appendix 6.

6.2 Agency Coordination

Preliminary coordination was made with the following:

- Native American Tribes
- Outagamie County Historical Society
- State Historical Society of Wisconsin
- Wisconsin Department of Natural Resources
- Wisconsin Department of Transportation – Bureau of Aeronautics
- United States Department of Interior – Fish and Wildlife Service

The Preliminary Environmental Assessment was distributed to the following agencies/organizations:

Federal Agencies

- United States Department of Agriculture – Natural Resources Conservation Service
- United States Army Corps of Engineers
- United States Department of Housing & Urban Development
- United States Department of Interior – Fish and Wildlife Service
- United States Department of Transportation Federal Aviation Administration
- United States Environmental Protection Agency

State Agencies

- State Historical Society of Wisconsin
- Wisconsin Department of Natural Resources
- Wisconsin Department of Transportation – Bureau of Aeronautics*****
- Wisconsin Department of Transportation – Environmental Process & Documentation Section

Local Governments/Agencies

- Appleton Public Library*****
- East Central Regional Planning Commission
- Outagamie County
    - Appleton International Airport*****
    - Community and Economic Development and County Owned Real Estate, Comprehensive/Long Range Planning
    - County Clerk*****
    - County Zoning Administrator
- Village of Greenville

***** Locations where a copy of the Preliminary Environmental Assessment was available for public review.

6.3 Future Opportunities For Public Involvement

The comment period on the Preliminary Environmental Assessment is closed. The process has moved on to the decision document. If a FONSI is issued, a notification of the issuance of the FONSI will be placed in the local newspaper.

6.4 Public Information Web Site

A public information website was established to disseminate Environmental Assessment project related information. The website contains a link to the Airport's website, a link to the purpose and need for the proposed project, a link to the Phase I Environmental Assessment, links to the preliminary and final environmental assessments (when available), and project information/updates. The web site is accessible at https://westwoodps.com/appleton-international-airport.

Following the public comment period, reference documents may be removed from the website. Reference documents can be made available upon request to the Wisconsin Department of Transportation - Bureau of Aeronautics or the FAA Chicago Airport District Office.

CHAPTER 7 - PREPARERS

This final environmental assessment was prepared in 2024 by Westwood Professional Services, Inc., Appleton office, One Systems Drive, Appleton, Wisconsin 54914. The following personnel were involved with this project.

Brian D. Wayner, P.E.
Service Leader, Environmental

As environmental service leader, Mr. Wayner is responsible for the quality of work performed by the professionals in the department. He is involved in the planning and implementation of work plans, and directly oversees project work performed in the hydrogeology and engineering areas. Technical experience includes preparing environmental assessments, environmental impact statements, performing investigations and designing remediations for soil and groundwater contaminated sites.

- M.S., Environmental Engineering, University of New Haven, West Haven, Connecticut
- B.S., Electrical Engineering, University of Wisconsin – Milwaukee
- Professional Engineer, 2002, Wisconsin #35304

Aaron L. Stewart, P.E.
Aviation Services Manager, Wisconsin

Mr. Stewart has extensive experience in airport design and construction. His responsibilities include project administration, design reports, coordination with the Bureau of Aeronautics, FAA, and airport managers, and preliminary and final design. As the aviation services manager, Mr. Stewart is responsible for the quality of work performed by the professionals in the department. His experience also included project manager and resident engineer for airfield paving, earthwork, drainage and turf restoration.

- B.S., Civil Engineering, University of Wisconsin - Milwaukee, WI
- A.A.S., Civil Engineering Technology, Northeast WI Technical College, Green Bay, WI
- Professional Engineer, 1997, Wisconsin #32318

Jason Weis, P.E., GISP
Project Manager

Mr. Weis is professional engineer with extensive experience in geographic information systems (GIS) and database application design. He is also involved with hydraulic and hydrologic modeling, sidewalk management programs and municipal stormwater management programs.

- M.S., Environmental Engineering, University of Wyoming
- B.S., Civil Engineering, University of Wisconsin – Platteville
- Professional Engineer, Wisconsin # 36681

Evan Dujardin
Scientist/Hydrogeologist

Mr. Dujardin is a scientist/hydrogeologist. His experience includes Phase I and Phase II Environmental Site Assessments, and site investigations for soil, groundwater, sediment, and vapor in accordance with Wisconsin Administrative Code NR 700 regulations. Mr. Dujardin has assisted in the preparation of Investigation reports, Low Hazard Waste Grant of Exemption requests, Material Management Plans, and closure requests. He also performs Wisconsin Department of Transportation hazardous waste assessment work. Mr. Dujardin has his Tank System Site Assessor certification.

- B.S., Geosciences with an emphasis in Hydrogeology, University of Milwaukee

Kimberly Kennedy
Environmental Scientist

Ms. Kennedy is a wetland specialist with experience in wetland delineation work. She has provided wetland delineation services in various parts of Wisconsin as part of highway, airport and bridge reconstruction projects, and private development projects. Ms. Kennedy works closely with the Corps of Engineers, the Wisconsin Department of Natural Resources, and appropriate county and local agencies on wetland issues. Recent project experience has involved the Wisconsin counties of Brown, Calumet, Fond du Lac, Manitowoc, Outagamie, Portage, Winnebago and Wood.

- Associates Degree, Applied Science in Natural Resources, Fox Valley Technical College
- Wetland Delineation Workshops - Plant Identification, Hydric Soils, Basic Wetland Delineation, Advance Wetland Delineation, UW – Lacrosse

Subconsultant: HGA

Andy DeRocher, P.E.
Senior Project Engineer

Mr. DeRocher provided preliminary geothermal design calculations and general geothermal system information. He has 20 years of experience in improving building performance in a wide range of building types, including healthcare, laboratory, government, data centers, and educational facilities. Mr. DeRocher's areas of specialty are beneficial electrification and decarbonization, geothermal and heat recovery system design, solar energy and battery storage systems, and commissioning/retro-commissioning of mechanical, electrical, and plumbing systems.

- B.S., Civil and Environmental Engineering, University of Wisconsin – Madison
- Professional Engineer, 2016, Wisconsin #45007

APPENDIX 1 - SITE PHOTOGRAPHS

Photo Log

Site Location: Appleton International Airport, Greenville, WI	
Photo # 1	
Date: 5/9/2022	
Description: Proposed location of geothermal vertical heat exchange borehole field prior to apron expansion with system area outlined. Source: NearMap	

Site Location: Appleton International Airport, Greenville, WI	
Photo # 2	
Date: 5/11/2023	
Description: Proposed location of geothermal vertical heat exchange borehole field with system area outlined. Soil disturbance from apron expansion. Source: NearMap	

Photo Log

Site Location:
Appleton International Airport, Greenville, WI

Photo #
3

Date:
11/9/2023

Description:
Proposed location of geothermal vertical heat exchange borehole field.

Facing south.

Site Location:
Appleton International Airport, Greenville, WI

Photo #
4

Date:
11/9/2023

Description:
Proposed location of geothermal vertical heat exchange borehole field.

Soil disturbance from apron expansion.

Facing southeast.

Photo Log

Site Location: Appleton International Airport, Greenville, WI	
Photo # 5	
Date: 11/9/2023	
Description: Proposed location of geothermal vertical heat exchange borehole field. Soil disturbance from apron expansion. Facing northwest.	

Site Location: Appleton International Airport, Greenville, WI	
Photo # 6	
Date: 9/2021	
Description: Proposed location of geothermal vertical heat exchange borehole field. Prior to apron expansion. If the geothermal system is constructed, area would be similarly restored to maintained turf. Source: Google Earth	

Photo Log

Site Location: Appleton International Airport, Greenville, WI	
Photo # 7 **Date:** 5/11/2023 **Description:** Proposed topsoil stockpile location with stockpile area outlined. Source: NearMap	

Site Location: Appleton International Airport, Greenville, WI	
Photo # 8 **Date:** 11/9/2023 **Description:** Proposed topsoil stockpile location. Facing east.	

Photo Log

Site Location: Appleton International Airport, Greenville, WI	
Photo # 9	
Date: 5/11/2023	
Description: Proposed clay/soil cutting fill location with cutting fill area outlined.	
Source: NearMap	

Site Location: Appleton International Airport, Greenville, WI	
Photo # 10	
Date: 11/9/2023	
Description: Proposed clay/soil cutting fill location.	
Facing west.	

APPENDIX 2 - CORRESPONDENCE

Jenna DeShaney

From: Trimble, Andrew - DOT <Andrew.Trimble@dot.wi.gov>
Sent: Wednesday, March 10, 2021 12:51 PM
To: DOT DL THPOs
Cc: DOT BEES Cultural Resources; mikew@badriver-nsn.gov; ned.danielsjr@fcpotawatomi-nsn.gov; marlon.whiteeagle@ho-chunk.com; louis.taylor@lco-nsn.gov; jwildcatsr@ldftribe.com; chairman@mitw.org; Shannon Holsey; thill7@oneidanation.org; rick.peterson@redcliff-nsn.gov; susanl@stcroixtribalcenter.com; 'garland.mcgeshick@scc-nsn.gov'; Shinners, Dana M - DOT; Aaron Stewart; Jenna DeShaney
Subject: WisDOT request for comment and notification of Federal undertaking under 36 CFR 800 (Project IDs 3-55-0002-57 and 3-55-0002-59)
Attachments: Combined ATW Site Location Map.pdf; Apron APE.pdf; Rwy Txwy APE.pdf; Service Rd APE.pdf

WisDOT Project: 0744-40-57 and 0744-40-92
Highway/Termini: Appleton International Airport (ATW)
County: Outagamie County

The Wisconsin Department of Transportation (WisDOT), in cooperation with the Federal Aviation Administration (FAA), is considering an undertaking to replace and expand terminal ramp pavements, repair and rehabilitate runway and taxiway pavements, and expand an existing service road at Appleton International Airport. An overview of the areas for consideration appears in the attached "Combined ATW Site Location Map" sketch.

1) The airport has experienced enough growth in their commercial passenger service that studies are underway to expand the existing concourse to the west. Before that can happen, the existing terminal apron pavement also has to be expanded to the west to allow for aircraft circulation to the passenger boarding gates. This area is in the middle of the airfield on the attached "Apron APE" sketch.
   - The hatched area shown on the Apron APE sketch includes drainage areas, the only new pavement is adjacent to the terminal ramp.

2) The runway and taxiway pavement repair and rehabilitation takes place on existing pavements, depicted on the attached "Rwy Txwy APE" sketch.
   - Work on the runway will range from crack filling to replacement of individual pavement panels.
   - Replacement of the existing taxiway pavements is expected. These pavements are not expanded in this project.

3) The service road around the end of Runway 31 is not wide enough to allow two-way traffic. This existing service road appears on the attached "Service Rd APE" sketch.
   - The expansion involves widening the existing road, this is not a realignment or lengthening.

Your tribe has requested to be notified of undertakings in this area of Wisconsin. Attached is information regarding the proposed undertaking to assist you in providing comments regarding the determination of the area of potential effect (APE) and potential impacts to historic properties and/or burial sites.

WisDOT would be pleased to receive any comments your tribe wishes to share regarding the determination of the APE or potential impacts to historic properties and/or burials in this undertaking. Additionally, you may use this opportunity to request consultation pursuant to 36 CFR 800.3. WisDOT understands that your tribe is a sovereign nation and as such has the discretion to consult government to government with the FAA directly. Also, other environmental studies may be conducted to include endangered species survey, contaminated material investigations, soil testing and right-of-way surveys. Results of these studies will assist

the engineers in the design to avoid, minimize or mitigate the proposed project's effect upon cultural and natural resources. If WisDOT identifies the potential for historic properties to be affected, you will be provided more information.

To ensure your comments are considered during this early phase of project development, WisDOT requests a response within 30 days of receipt of this letter.

If your tribe wishes to become a consulting party under Section 106 of the National Historic Preservation Act or would like to receive additional information regarding this proposed project, please reply to this email or contact:

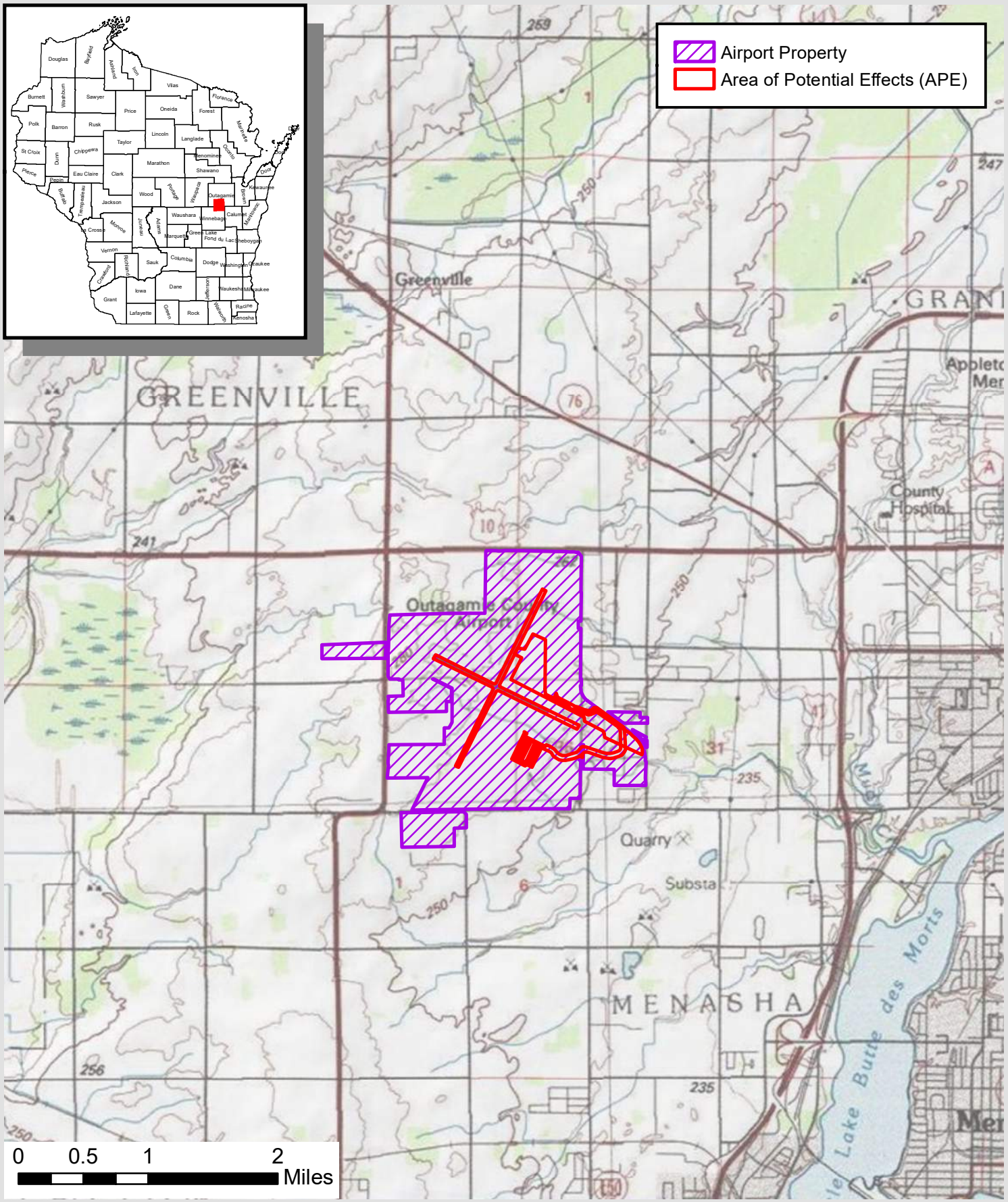
WisDOT Project Manager: Andrew Trimble
Phone: 608-267-0454
Address: Wisconsin Department of Transportation - Bureau of Aeronautics
4822 Madison Yards Way, 5th Floor South
Madison, WI 53705

EC: bees.cr@dot.wi.gov (already included in the DL list)
Regional Tribal Liaison
Tribal Leader
CC: Johnathan Buffalo, NAGPRA Rep. – Sac and Fox Tribe of the Mississippi in Iowa
Cultural Preservation Office - Iowa Tribe of Oklahoma
Hattie Mitchell, THPO – Prairie Band Potawatomi Nation

Attachments: Project Location Maps (4)

Andrew Trimble, P.E.
Airport Development Engineer
Andrew.Trimble@dot.wi.gov
P (608) 267-0454 | F (608) 267-6748
(Mr., he, him, his)

Wisconsin Department of Transportation - Bureau of Aeronautics
4822 Madison Yards Way, 5th Floor South
Madison, WI 53705



Westwood 1 Systems Drive Appleton, WI 54914 (920) 735-6900 www.westwoodps.com	N W E S	***ATW RUNWAYS & SOUTH GA TAXIWAYS*** **SITE LOCATION MAP** APPLETON INTERNATIONAL AIRPORT OUTAGAMIE COUNTY, WISCONSIN	Project Manager: Project Engineer: Drawn By: JMD Checked By: Date: 3/10/2021	SCALE: 1 " = 1 miles PROJECT NO. **R3001124.00** FIGURE NO. **1**

F:\TR\JOBS\E2415A20 ATW South GA Taxiways\GIS\Combined ATW Site Location Map.mxd

Parcels (2018)
Airport Property
Area of Potential Effects (APE)
Possible Haul Routes

DISCOVERY DR
CHALLENGER DR
COMMUNICATION CT
COMMUNICATION DR
COLL
COLLEG
AEROTECH
W SPENCER RD
W SPENCER ST
PLYMOUTH ST
PRISCILLA LA
CAPE COD AV
S MAYFLOWER DR
PILGRIM ST
COLONIAL DR
W CEDAR CREST CT
W NATURES LA
COLUMBIA DR
CTY TK CB
GREENVILLE CENTER DR
PATHFINDER DR

AREA OF POTENTIAL EFFECTS
92.2 ACRES

0 500 1,000 Feet

N
W E
S

Project Manager:
Project Engineer: JCW
Drawn By:
Checked By:
Date: 4/30/2020

ATW CONCOURSE AND APRON EXPANSION

AREA OF POTENTIAL EFFECTS

APPLETON INTERNATIONAL AIRPORT
OUTAGAMIE COUNTY, WISCONSIN

OMNI ASSOCIATES
a Westwood company

SCALE:
1 " = 500 '

PROJECT NO.
R3000146.00

FIGURE NO.
2

F:\TRAVAIRPORTS\ATW\Environmental\2020 Terminal Expansion\Cat\ExGIS\APE.mxd

Airport Property

Area of Potential Effects (APE)

RUNWAY 12-30

RUNWAY 3-21

SOUTH GA

TOTAL AREA OF POTENTIAL EFFECTS: 62.70 ACRES

0 500 1,000 Feet

N

W E

S

Project Manager:	
Project Engineer:	
Drawn By:	JMD
Checked By:	
Date:	2/11/2021

ATW RUNWAYS & SOUTH GA TAXIWAYS

AREA OF POTENTIAL EFFECTS

APPLETON INTERNATIONAL AIRPORT
OUTAGAMIE COUNTY, WISCONSIN

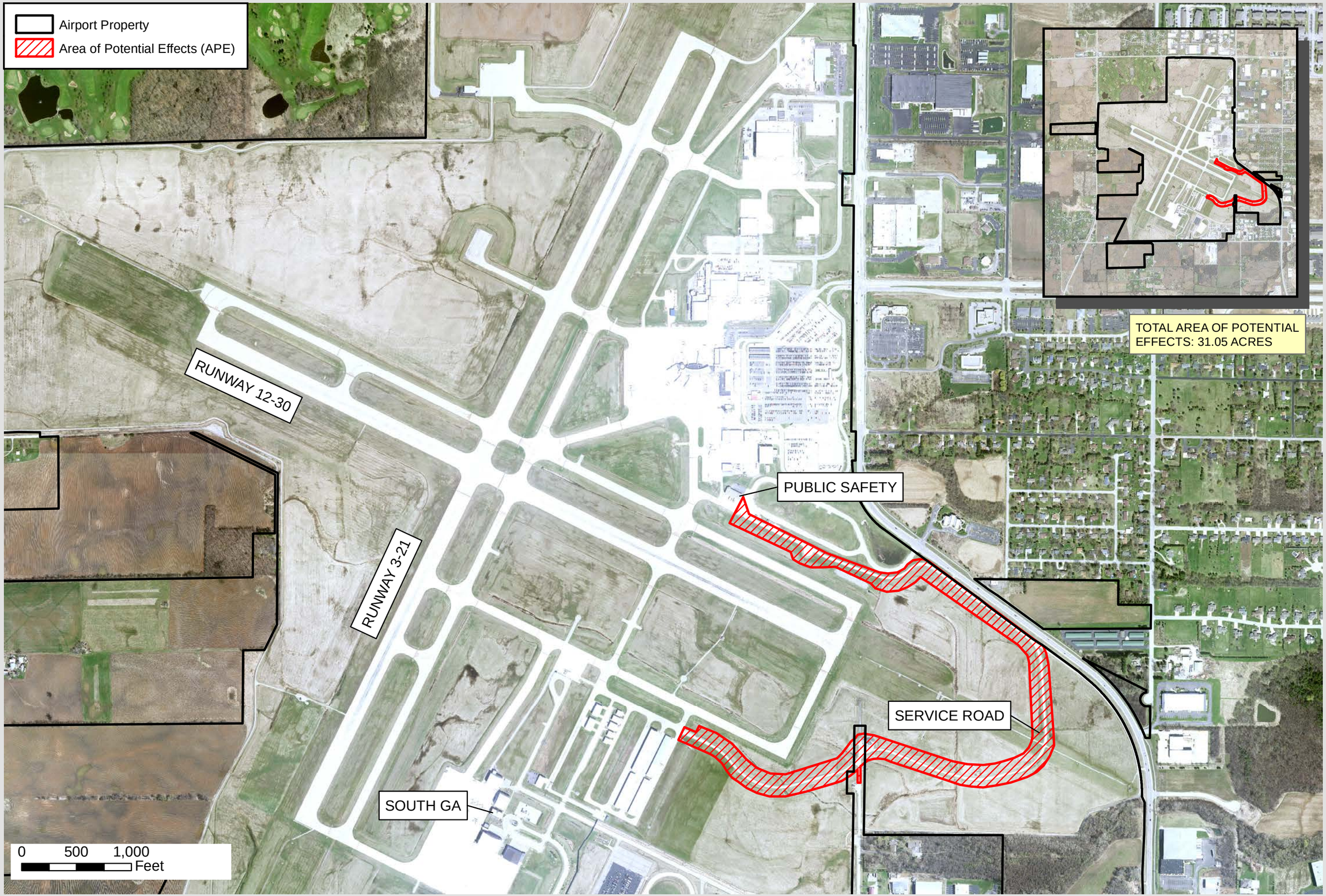
Westwood

SCALE:
1 " = 795 '

PROJECT NO.
R3001124.00

FIGURE NO.
2

F:\TR\JOBS\E2415\A20 ATW South GA Taxiways\GIS\Figure 2 - APE.mxd



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W E
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Project Manager:
Project Engineer: JMD
Drawn By:
Checked By:
Date: 2/11/2021

AREA OF POTENTIAL EFFECTS

ATW SERVICE ROAD

APPLETON INTERNATIONAL AIRPORT
OUTAGAMIE COUNTY, WISCONSIN

Westwood

SCALE:
1 " = 795 '

PROJECT NO.
R3001124.00

FIGURE NO.
2

F:\TRU\OBS\E2415A20 ATW South GA Taxiways\GIS\Service Road Cat Ex\Figure 2 - APE.mxd

From: Matt Carpenter <matt@myhistorymuseum.org>
Sent: Wednesday, May 6, 2020 11:48 AM
To: Jenna Deshaney
Cc: Andrew.Trimble@dot.wi.gov; WeberAJ@co.outagamie.wi.us; Aaron Stewart
Subject: Re: Appleton International Airport, Proposed Airport Development - Concourse and Apron Expansion

Jenna,
No concerns from the Outagamie county Historical Society perspective.
thank you for checking in with us and best wishes for the project.
Matt

Matthew Carpenter
Executive Director
History Museum at the Castle
920-733-8445 ext. 113

From: Jenna Deshaney <Jenna.Deshaney@omnni.com>
Sent: Wednesday, May 6, 2020 11:29 AM
To: Matt Carpenter <matt@myhistorymuseum.org>
Cc: Andrew.Trimble@dot.wi.gov <Andrew.Trimble@dot.wi.gov>; WeberAJ@co.outagamie.wi.us <WeberAJ@co.outagamie.wi.us>; Aaron Stewart <Aaron.Stewart@omnni.com>
Subject: Appleton International Airport, Proposed Airport Development - Concourse and Apron Expansion

Hello Mr. Carpenter,

Attached is information about a proposed airport development at Appleton International Airport. We are working on an environmental document for the proposed project and we are interested in your input. Please reach out if you have any questions or concerns.

Thank you,

Jenna DeShaney
Environmental Scientist
Direct: 920-830-6115
Main: 920-735-6900
Cell: 920-851-9946

OMNNI Associates

a **Westwood** company
One Systems Drive, Appleton, WI 54914
OMNNI.com | **westwoodps.com**

ENGINEERING
ARCHITECTURE
ENVIRONMENTAL

OMNNI ASSOCIATES
a Westwood company

ONE SYSTEMS DRIVE
APPLETON, WI 54914-1654
1-800-571-6677
920-735-6900
FAX 920-830-6100

May 6, 2020

Mr. Matthew J. Carpenter
Outagamie County Historical Society
History Museum at the Castle
330 East College Avenue
Appleton, WI, 54911

Re: Appleton International Airport, Proposed Airport Development – Concourse and Apron Expansion

Dear Mr. Carpenter:

The Wisconsin Department of Transportation, Bureau of Aeronautics, is beginning preliminary studies for improvements to the Appleton International Airport (See Figure 1 – Site Location Map). These proposed improvements include concourse and apron expansion, taxiway relocation, stormwater detention facility relocation, airfield lighting relocation, weather station relocation, and service road modification. The project area is located entirely within airport boundaries. The area of potential effects consists of land that has been previously disturbed for paving and/or grading operations (See Figure 2 – Area of Potential Effects). The Wisconsin National Register of Historic Places online database was searched. No records in or near the proposed project area were identified.

We are requesting that the Outagamie County Historical Society identify any concerns they may have regarding the proposed project or related information of the area. If you would like to receive additional information regarding this proposed project, please contact me at Jenna.Deshaney@omnni.com or at 920-830-6115. Thank you for your assistance.

Sincerely,

Jenna DeShaney
Environmental Scientist

Attachments Site Location Map

Area of Potential Effects

cc: Abe Weber, Airport Director (by email)
Andrew Trimble, WisDOT, BOA (by email)
Aaron Stewart, OMNNI Associates, a Westwood Company (by email)

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
2984 Shawano Avenue
Green Bay, WI 54313

Tony Evers, Governor
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

December 7, 2023

Mr. Andrew Trimble, P.E.
Wisconsin Department of Transportation – Bureau of Aeronautics (BOA)
PO Box 7914
Madison, WI 53707-7914
[sent electronically]

Subject: DNR Initial Review
Project I.D. 0744-47-94 / BOA ID ATW 1010
ATW Geothermal System for the Terminal Building
Appleton International Airport (ATW)
Outagamie County
Sections 25, 36 – T21N – R16E

Dear Mr. Trimble:

The Wisconsin Department of Natural Resources (DNR) has received the information you provided for the above-referenced project. According to your proposal, the purpose of this project is to construct a new geothermal heat pump system to provide heating and cooling to the airport's terminal building. The location of the proposed geothermal vertical heat exchange borehole field would be on approximately 2.6 acres of Airport property, southwest of the terminal building. Preliminary design calls for the borehole heat exchange piping to be piped into 16 circuits of 15 bores each. The circuit headers would be piped to a central underground vault, which would manifold these circuits into a pair of 14-inch mains back to the building. If the project proposal changes, please reinitiate coordination with the DNR.

Preliminary information has been reviewed by DNR staff for the project under the DNR/DOT Cooperative Agreement. Initial comments on the project as proposed are included below, and we assume that additional information will be provided that addresses all resource concerns identified. When requesting Final Concurrence/Water Quality Certification, please send the most up-to-date plan set (including the erosion control plan sheets), contract special provisions, Wetland Impact Tracking Form, Notice of Intent for the Transportation Construction General Permit (TCGP), and any additional pertinent information to demonstrate environmental commitments will be met.

Project-Specific Resource Concerns

Fisheries/Stream Work:
There are headwaters to Mud Creek located near the proposed geothermal system, excess topsoil stockpile, and excess embankment area, however it appears that these will be avoided with the project impacts. These headwaters are non-navigable at these locations, but runoff during construction is still a concern. Proper planning and implementation of erosion control Best Management Practices (BMPs) should be sufficient protection for this project.

Wetlands:
There is potential for wetland impacts to occur as a result of this project, as they appear to be in close proximity to the potential areas of effect. Any wetlands present would likely follow close to the headwaters/drainageways to Mud Creek, so it is likely that they can be avoided. If a wetland delineation has been conducted in these areas, please share that delineation with the DNR for confirmation.

Wetland impacts must be avoided and/or minimized to the greatest extent practicable. If necessary, unavoidable wetland losses must be compensated for in accordance with the DNR/DOT Cooperative Agreement and the WisDOT Wetland Mitigation Banking Technical Guideline. Please provide the wetland community type and quantity of unavoidable wetland impacts, and mitigation information for this project using the Wetland Impact Tracking Form.

Natural Heritage Conservation
Based upon a review of the Natural Heritage Inventory (NHI Portal) dated 12/6/23, there are no known listed species or suitable habitat that could be impacted by this project. With this review the following has also been determined:

- The NHI Portal database contains all current Northern Long-eared Bat (NLEB) and Tricolored Bat (TCB) roost sites and hibernacula in Wisconsin. These include verified survey results from WI DNR, FWS, and private organizations. Based on project location, this project is more than one mile from a NLEB/TCB known maternity roost tree AND a known hibernaculum. Therefore, this project can proceed without state restrictions for the Northern Long-eared Bat and the Tricolored Bat. This project may be within the federal buffers of a documented Northern Long-eared Bat occurrence. Follow the "FHWA, FRA, FTA Programmatic Consultation for Transportation Projects affecting NLEB or Indiana Bat or the NLEB Rangewide Determination Key in IPaC" to determine the project activity's affects and/or complete further consultation with FWS, as necessary. This project is located outside of any High Potential Zones (HPZ) for the Rusty Patched Bumblebee (RPBB), and therefore should have no impact on this federally endangered species.
- This project is located outside of any High Potential Zones (HPZ) for the Rusty Patched Bumblebee (RPBB), and therefore should have no impact on this federally endangered species.

Invasive Species:
All project equipment shall be decontaminated for removal of invasive species prior to and after each use on the project site by utilizing other best management practices (https://dnr.wi.gov/topic/Invasives/bmp.html) to avoid the spread of invasive species as outlined in NR 40, Wis. Adm. Code. For further information, please refer to the following: https://dnr.wi.gov/topic/invasives/classification.html

Storm Water Management & Erosion Control:

- For projects disturbing an acre or more of land erosion control and storm water measures must adhere to the Wisconsin Pollutant Discharge Elimination System Transportation Construction General Permit (TCGP) for Storm Water Discharges. Coverage under TCGP is required prior to construction. WisDOT should apply for permit coverage by submitting a Notice of Intent (NOI) prior to, or when requesting Final Concurrence. Permit coverage will be issued by DNR with the Final Concurrence letter after design is complete and documentation shows that the project will meet construction and post-construction performance standards. For more information regarding the TCGP you can go to the following link, and click on the "Transportation" tab: https://dnr.wi.gov/topic/Sectors/Transportation.html

- All projects require an Erosion Control Plan (ECP) that describes best management practices that will be implemented before, during and after construction to minimize pollution from storm water discharges. Additionally, the plan should address how post-construction storm water performance standards will be met for the specific site. The project design and Erosion Control Implementation Plan (ECIP) must comply with the TCGP in order to receive permit-coverage from the DNR.

- Once the project contract has been awarded, the contractor will be required to outline their implementation of erosion control measures as it relates to the construction project, as well as their construction methods in the ECIP. An adequate ECIP for the project must be developed by the contractor and submitted to this office for review at least 14 days prior to the preconstruction conference. For projects regulated under the TCGP, submit the ECIP as an amendment to the ECP.

Other:
All other local, state, and federal permits and/or approvals must be obtained prior to commencing construction activities.

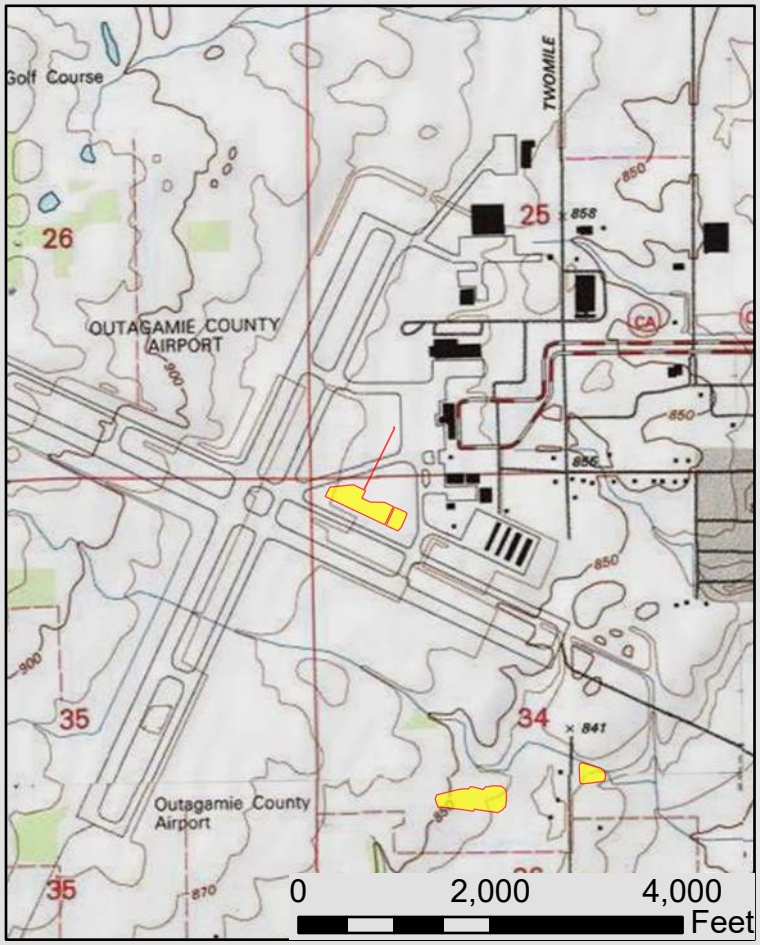
The above comments represent the DNR's initial concerns for the proposed project and does not constitute final concurrence. Final concurrence will be granted after further review of refined project plans, Erosion Control Plan, Wetland Impact Tracking Form, Special Provisions, NOI for the TCGP, and additional coordination if necessary. If any of the concerns or information provided in this letter requires further clarification, please contact this office at (920) 366-1544, or email at matthew.schaeve@wisconsin.gov.

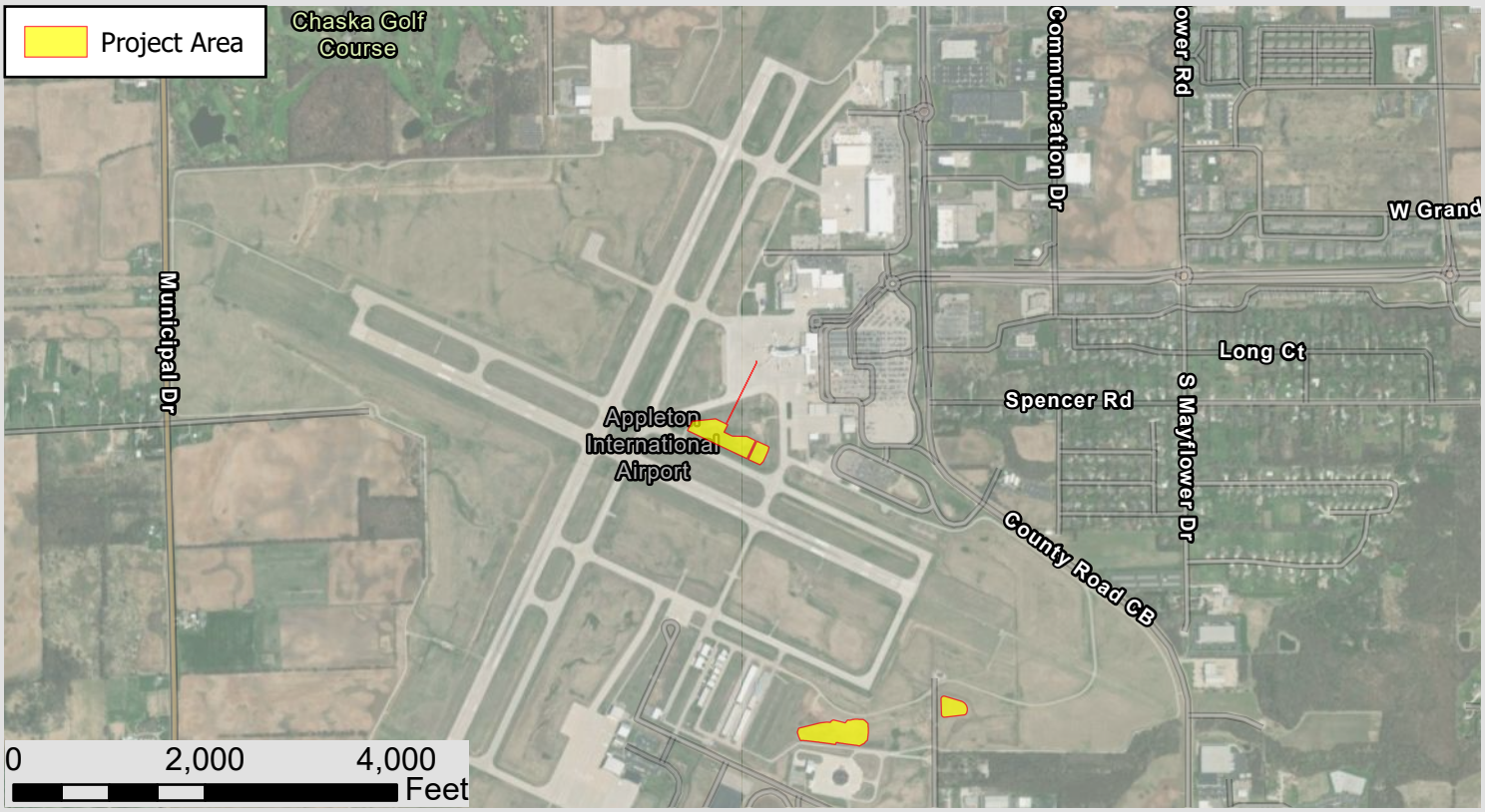
Sincerely,

Matthew D. Schaeve
Environmental Analysis & Review Specialist
Northeast Region

Electronic copies: Mallory Palmer – Aeronautical Environmental Coordinator
Brian Wayner - Westwood
Aaron Stewart – Westwood
Deborah Lyons-Roehl – WDNR Drinking and Groundwater

Attachments: Project Location Maps





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(920) 735-6900
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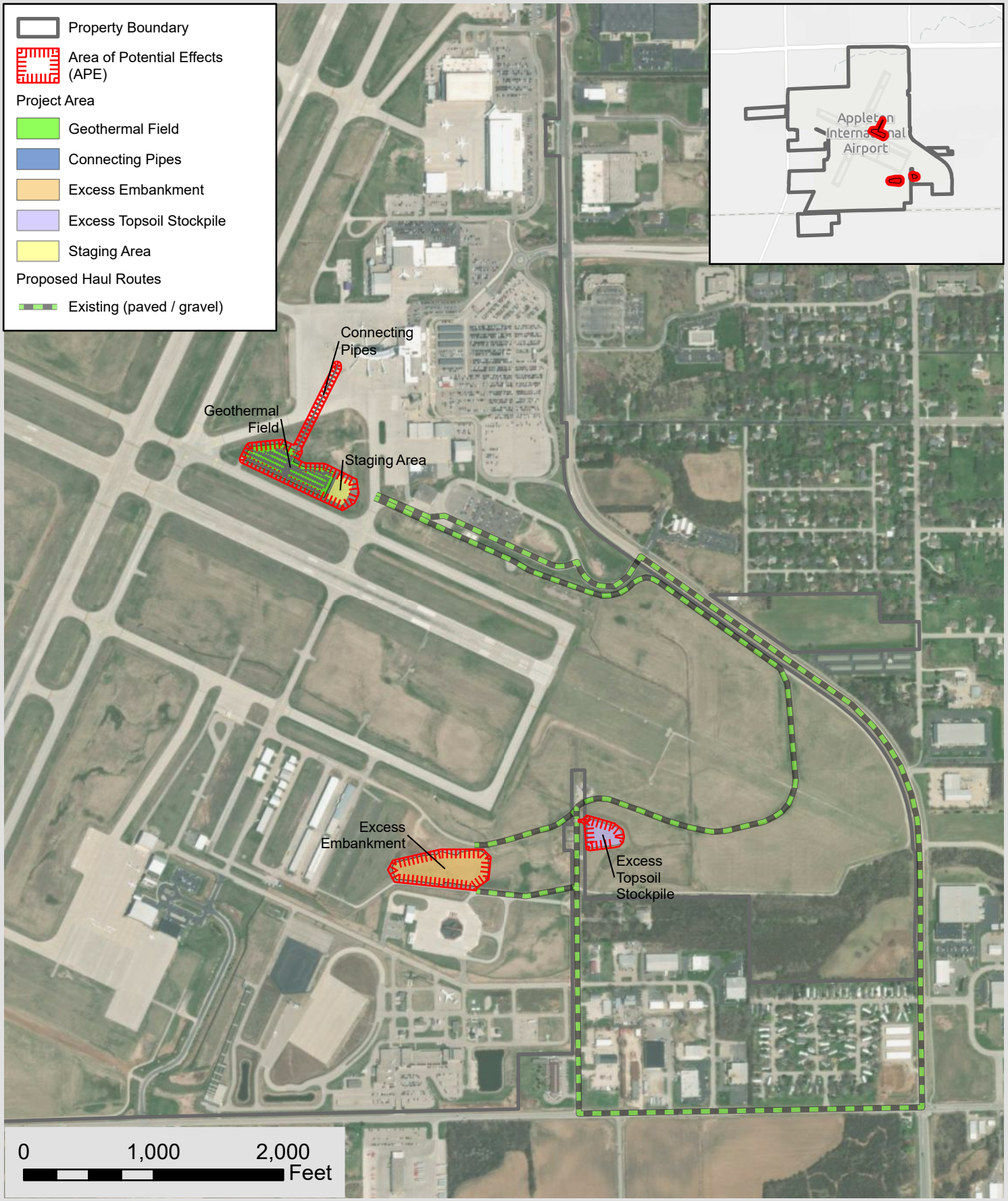
GEOTHERMAL ENVIRONMENTAL ASSESSMENT

LOCATION MAP

APPLETON INTERNATIONAL AIRPORT
VILLAGE OF GREENVILLE, OUTAGAMIE COUNTY, WISCONSIN

Project Manager:	SCALE: 1 in = 2,000 ft
Project Engineer:	
Drawn By: JCW	PROJECT NO. R3001381.00
Checked By:	
Date: 9/14/2023	FIGURE NO. 1

F:\TR\JOBS\E2422A21 ATW Terminal Apron\Environmental\2023 Geothermal EA\GIS\EnvAssessmentMaps.aprx
Printed: JCWeis 9/14/2023 12:17 PM



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GEOTHERMAL ENVIRONMENTAL ASSESSMENT

AREA OF POTENTIAL EFFECTS

APPLETON INTERNATIONAL AIRPORT
VILLAGE OF GREENVILLE, OUTAGAMIE COUNTY, WISCONSIN

Project Manager:	
Project Engineer:	
Drawn By:	JCW
Checked By:	
Date:	9/14/2023
SCALE:	1 in =1,000 ft
PROJECT NO.	**R3001381.00**
FIGURE NO.	4

F:\TR\JOBS\E2422A21 ATW Terminal Apron\Environmental\2023 Geothermal EA\GIS\EnvAssessmentMaps.aprx [Area of Potential Effects Map]
Printed: JCWeis 9/14/2023 11:44 AM

Brian Wayner

From: Brian Wayner
Sent: Thursday, March 7, 2024 4:23 PM
To: Schaeve, Matthew D - DNR
Cc: Palmer, Mallory K - DOT
Subject: RE: ATW Geothermal EA - topsoil

Thanks Matt!

Yes, ATW would like to stockpile any clean topsoil on site for future use. The proposed plan is just to stockpile the soils at the airport until there is a need for them onsite or if an offsite property owned by the county requires topsoil. No onsite or offsite locations have been identified yet, so they are hoping to stockpile the topsoil.

Brian Wayner
Environmental Manager
brian.wayner@westwoodps.com
Licensed in WI

direct (920) 830-6141
main (920)-735-6900
cell (920) 851-0366

Westwood
1 Systems Drive
Appleton, WI 54914
westwoodps.com

From: Schaeve, Matthew D - DNR <Matthew.Schaeve@wisconsin.gov>
Sent: Thursday, March 7, 2024 3:00 PM
To: Brian Wayner <Brian.Wayner@westwoodps.com>
Cc: Palmer, Mallory K - DOT <malloryk.palmer@dot.wi.gov>
Subject: RE: ATW Geothermal EA - topsoil

Hi Bryan,

The short answer to your question is **yes**, but with conditions, which I'll explain.

This sort of thing is typically handled during the Erosion Control Implementation Plan (ECIP) process, which is after the project is awarded, and before the PreConstruction meeting. Part B of the ECIP address what we call a Selected Site, which would need to be filled out for anything leaving the project site. Selected Sites can be used for waste or borrow, but not solid or hazardous waste, but meant more for clean soil, excess aggregate, riprap, etc. Anywhere the contractor intends to waste material offsite, that is not already a permitted facility, it is screened by the project team representing ATW, and also by myself for any potential environmental concerns, such as impacts to the following: wetlands; waterways, threatened and/or endangered species; floodplains; known contaminated sites. BOA or ATW would likely coordinate the archeological or historical screenings. If it is already a permitted industrial or commercial facility, or another project that has its own permits in order (i.e. local, state, federal, etc.), then as long as the material is considered clean it would be fine. Anywhere material would be used offsite would need to be identified and reviewed by us, which Part B steps the contractor through the process.

With that said, from my experience working with ATW, they usually stockpile and store any clean soil on site for future use.

Hope that helps,

We are committed to service excellence.
Visit our survey at http://dnr.wi.gov/customersurvey to evaluate how I did.

Matt Schaeve

Environmental Analysis & Review Specialist
Bureau of Environmental Analysis & Sustainability
Wisconsin Department of Natural Resources
2984 Shawano Ave., Green Bay, WI 54313
Phone: (920) 366-1544
Fax: (920) 662-5413
matthew.schaeve@wisconsin.gov

dnr.wi.gov

From: Brian Wayner <Brian.Wayner@westwoodps.com>
Sent: Wednesday, March 6, 2024 9:24 AM
To: Schaeve, Matthew D - DNR <Matthew.Schaeve@wisconsin.gov>
Cc: Palmer, Mallory K - DOT <malloryk.palmer@dot.wi.gov>
Subject: ATW Geothermal EA - topsoil

Hi Matt,

I am addressing FAA comments on the draft ATW Geothermal narrative EA. I attached your initial review letter for reference. The environmental review staff at the FAA wanted me to verify that the use of salvaged topsoil from the proposed work could be used on other offsite county projects. Their experience has been that materials typically do no go offsite, so they asked that I verify with the state that this would be allowed. I have also been discussing the topsoil reuse with Mallory.

Background
For the proposed geothermal system borehole field, topsoil would be stripped off and stockpiled in the proposed stockpile location. Underlying clay soils would be removed to rough grade and placed in the proposed clay fill location. After construction of the geothermal system borehole field, approximately four inches of the stockpiled topsoil would be placed back on the disturbed area and seeded. We are anticipating that there will be remaining topsoil in the stockpile after using what is needed for the borehole field restoration. We are proposing that this excess topsoil can be used as needed in other areas of the airport or other offsite county projects that may require topsoil. There is no indication that the topsoil would be contaminated. Glycol from deicing operations is picked up by storm sewer before reaching the proposed location of the borehole field.

Does the DNR have any concerns with using excess topsoil either at other locations on the airport or at other offsite county projects?

Brian Wayner, P.E.
Service Leader, Environmental

APPENDIX 3 - EMISSION ASSUMPTIONS AND CALCULATIONS

Estimated Construction Emissions Calculation Assumptions

Gallons of Diesel Consumed to CO_2
10180 grams of CO_2 = 1 gallon of diesel
10.180 x 10^3 metric tons CO_2 = 1 gallon of diesel
Source: https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references

CH_4 & N_2O Emissions for Non-Road Vehicles	
Diesel Equipment	CH_4 = 1.01 g/gallon
	N_2O = 0.94 g/gallon
Light Duty Trucks	CH_4 = 0.0290 g/mile
Source: https://www.epa.gov/system/files/documents/2023-03/ghg_emission_factors_hub.pdf	

Equipment	Estimated Fuel Burn Per Hour
Dozer/Scraper	6-8 gal/hour
Quad Axle Dump	4 gal/hour
Excavator	10-12 gal/hour
Articulated Dump	8 gal/hour
Heavy Dozer	12 gal/hour
Paver (conc or asphalt)	12 gal/hour
Geothermal Drill Rig	6 gal/hour

HDPE Pipe

Manufactured to SDR 11 dimensions with a pressure rating of 200 psi when tested at 73°F according to ASTM D638

Density 950 kg/m^3

Raw Material Extraction: 2.25 kilograms of CO_2 equivalent per kilogram of HDPE produced

Manufacturing Processes: 1.5 kilograms of CO_2 equivalent per kilogram of HDPE produced

Transportation: 0.3 kilograms of CO_2 equivalent per kilogram of HDPE produced

ATW Geothermal Estimated Construction Emissions															
Major Construction Operations Tasks	**Estimated Working Days (Days)**	**Estimated Equipment**	**Estimated Fuel Burn (gal/hr)**	**Hours per day (hr/day)**	**Estimated Diesel Fuel Consumed (gal)**	**CO_2 Conversion Factor (MT CO_2/gal)**	**MT CO_2**	**CH_4 Conversion Factor (g/gallon)**	**Grams CH_4 (g)**	**Grams to MT**	**MT CH_4**	**N_2O Conversion (g/gallon)**	**Grams N_2O (g)**	**Grams to MT**	**MT N_2O**
Preliminary Excavation and Site Prep	10	4 Quads 1 Dozer 1 Excavator	36	10	3600	0.01018	36.648	1.01	3636	1.00E-06	0.003636	0.94	3384	0.000001	0.003384
Geothermal Drilling	230	2 Drill Rigs	12	10	27600	0.01018	280.968	1.01	27876	1.00E-06	0.027876	0.94	25944	0.000001	0.025944
Topsoil Placement and Site Finishinig	10	2 Quads 1 Dozer	16	10	1600	0.01018	16.288	1.01	1616	1.00E-06	0.001616	0.94	1504	0.000001	0.001504
				Totals	**32800**		**333.904**				**0.033**				**0.031**

ATW Geothermal Estimated HDPE Pipe Emissions											
						kilograms of CO_2 equivalent (kg CO_2e)					
Construction Materials	Length of Pipe (feet)	Length of Pipe (meters)	Weight of Pipe (lb/ft)	Weight of Pipe (kg/m)	Total Weight of Pipe (kg)	Raw Material Extraction	Manufacturing Processes	Transportation	Total kg CO_2e/kg of pipe	kg CO_2e	MT-CO_2e
1.25" HDPE Pipe	202,430	61,701	0.306	0.455	28,097	2.25	1.5	0.3	4.05	113,793	113.79
4" HDPE Pipe	11,380	3,469	2.249	3.347	11,609	2.25	1.5	0.3	4.05	47,017	47.02
14" HDPE Pipe	1,790	546	20.970	31.207	17,026	2.25	1.5	0.3	4.05	68,956	68.96
Vault					20,294	2.25	1.5	0.3	4.05	82,191	82.19
									Totals	**311,956**	**311.96**

APPENDIX 4 - SECTION 106 REVIEW

CORRESPONDENCE/MEMORANDUM ----------State of Wisconsin
Division of Transportation System Development/ Bureau of Technical Services/ Environmental Services Section

Date: 09/26/2023

To: Kim Cook, SHPO

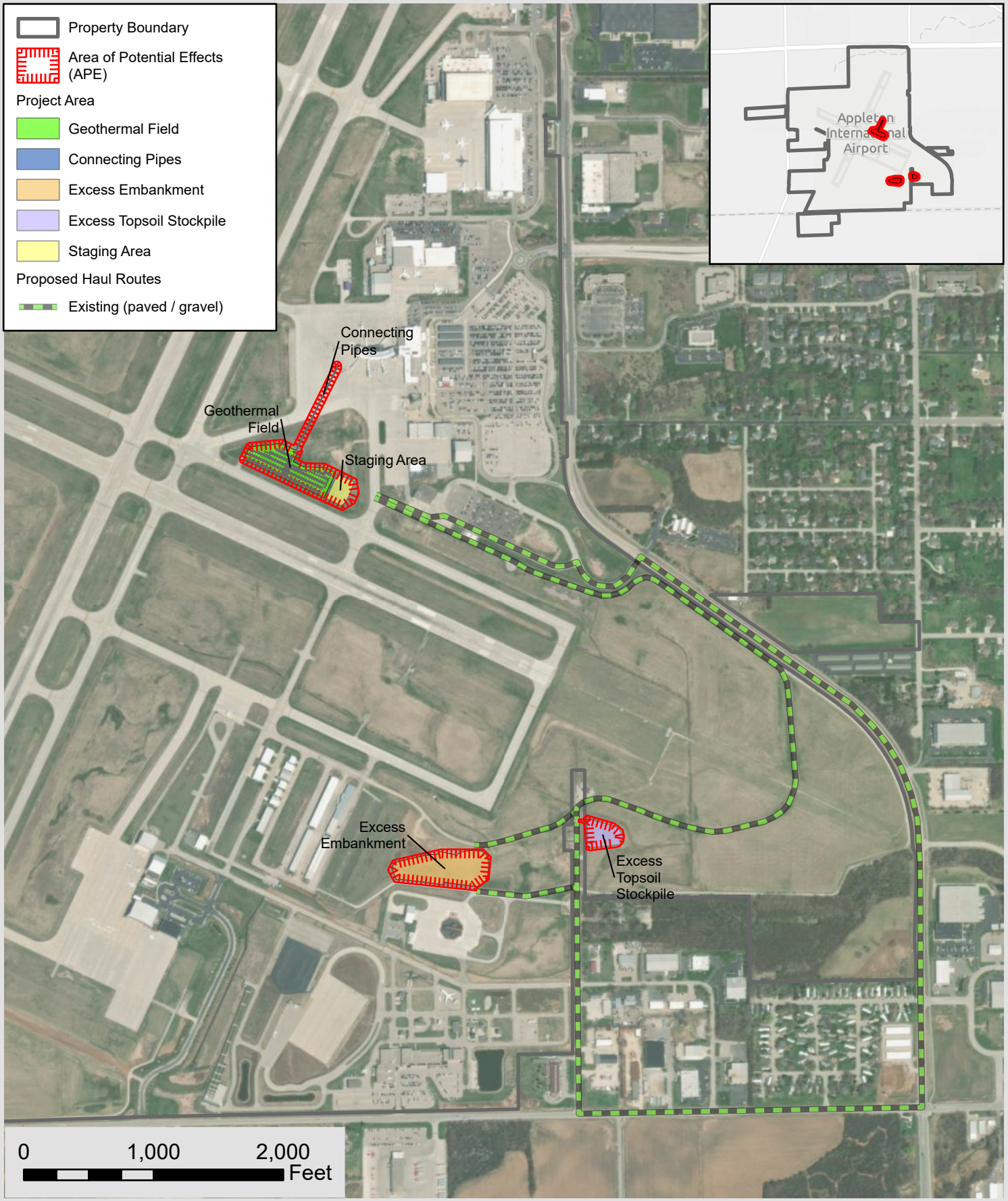
From: WisDOT BTS Cultural Resource Team

Subject: WisDOT I.D. 0744-40-57, Appleton International Airport, Outagamie County, WHS# 21-0996

Kim,

The initial 106 review for project 0744-40-57 (WHS# 21-0996) was submitted in 2021. SHPO concurred with the finding of "no eligible properties in APE" on September 9, 2021. Since that time, project activities have been amended to include the installation of a geothermal system for heating and cooling the airport terminal, including a designated excess material embankment and an excess topsoil stockpile area (see attached). These additional areas were reviewed in WHPD and it was determined that there are no properties with historic potential present. Additionally, all of the areas have previously been surveyed for archaeology with negative results.

Sam Rumschlag
WisDOT CRT
Attachments



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GEOTHERMAL ENVIRONMENTAL ASSESSMENT

AREA OF POTENTIAL EFFECTS

APPLETON INTERNATIONAL AIRPORT
VILLAGE OF GREENVILLE, OUTAGAMIE COUNTY, WISCONSIN

Project Manager:	
Project Engineer:	
Drawn By:	JCW
Checked By:	
Date:	9/14/2023
SCALE:	1 in =1,000 ft
PROJECT NO.	**R3001381.00**
FIGURE NO.	**X**

F:\TR\JOBS\E2422A21 ATW Terminal Apron\Environmental\2023 Geothermal EA\GIS\EnvAssessmentMaps.aprx [Area of Potential Effects Map]
Printed: JCWeis 9/14/2023 11:44 AM

BUREAU OF AERONAUTICS

SECTION 106 REVIEW
ARCHAEOLOGICAL/HISTORICAL INFORMATION

Wisconsin Department of Transportation

I. PROJECT INFORMATION

FOS Project ID ATW1007 – DOT 0744-40-57	County Outagamie
Airport Name Appleton International	Airport Manager Abram Weber
Project Engineer/Project Manager Andrew Trimble, BOA	(Area Code) Telephone Number (920) 832-5267
Planning/Design Consultant Aaron Stewart, Westwood	(Area Code) Telephone Number (920) 830-6177
Archaeological Consultant Rigden Glaab, Westwood	(Area Code) Telephone Number (952) 697-5791
Architecture/History Consultant Sara Nelson, Westwood	(Area Code) Telephone Number (952) 697-5790
Date of Need As soon as possible	21-0996

II. PROJECT DESCRIPTION

Type of Project ☐ New Construction ☒ Reconstruction ☐ Recondition ☐ Other
☐ Wetland Mitigation ☐ Runway Extension ☐ Land Acquisition

☐ Known Cemetery	Amount of land to be disturbed: Acres 92.2	Amount of acres to be acquired Acres None

Describe ground disturbing activity associated with proposed construction - e.g., strip construction, slope grading, temporary bypass, realignment, stream channel change, etc.

Brief Project Description: (Be specific and include all activities associated with the project.)

The proposed project at Appleton International Airport (ATW) consists of concourse and apron expansion as well as taxiway relocation, stormwater detention facility relocation, airfield lighting relocation, and weather station relocation. The estimated start date and duration of the project construction is April 1, 2022 through November 1, 2023. Activities associated with the project include on-site staging within the area of potential effects and utilizing possible haul routes on Discovery Dr to the north and Columbia Dr to the south of the main parking lot. Flight procedures will be uninterrupted. The disposal area has been approved off-site and there will be no need to use new or expanded material sources. The main justification for the project is to meet the growing needs of the airport.

The proposed project is entirely on airport property, which is owned and operated by Outagamie County. The airport is approximately five miles west of downtown Appleton. Specifically, the project is located in Sections 25, 26, 35 and 36 of Township 21 North, Range 16 East, Town of Greenville, Outagamie County, Wisconsin. The majority of the project area is developed and consists of maintained airfield surfaces, including turf and paved areas. There are mapped wetlands located in the project area. The project is located in the Lower Fox watershed. Soils are predominately Udorthents and Symco silt loam.

III. NOTIFICATION

How has notification of the project been provided to:

☒ Property Owners
- ☒ Public Information Meeting Notice: Property, Airport Recreation & Economic Development Committee 4/13/21
- ☐ Letter [required for Archaeology]
- ☐ Telephone Call
- ☐ Other

☒ Historical Societies/Organizations
- ☐ Public Information Meeting Notice
- ☒ Letter: Notified Outagamie County Historical Society; they have no concerns
- ☐ Telephone Call
- ☐ Other

☒ Native American Tribes
Must notify with:
- ☐ Public Info. Mtg. Notice
- ☒ Letter: sent 3/10/21

*Attach one copy of the base letter, list of addresses and comments received. For history include telephone memos as appropriate.

IV. AREA OF POTENTIAL EFFECTS [APE]

HISTORY: Describe the area of potential effects for buildings/structures.

The area of potential effects lies completely within the airport property boundary. Existing buildings/structures include the airport's concourse, apron, taxiway, and weather station. The concourse and apron will be expanded, and the taxiway and weather station will be relocated and/or modified. There are no historic buildings/structures in or near the proposed project location.

If you wish to claim there is no APE for buildings/structures, you must justify that claim. [NOTE: If there are no buildings/structures of any kind in the APE, go to Item V., check "Architecture/History survey is not needed" and state why.]

ARCHAEOLOGY: Area of potential effect for archaeology is the existing and proposed ROW, temporary and permanent easements. Agricultural practices do not constitute a ground disturbance.

V. SURVEY NEEDED

ARCHAEOLOGY	HISTORY
☒ Archaeological survey **is needed** [See Chapter 26-35-1 of FDM for procedure and # of exhibits]	☒ Architecture/History survey is needed
☒ Archaeological survey **is not needed** - provide justification ☐ SHPO records search conducted ___ (date). ☐ Screening list ___ (date). ☐ No potential to affect archaeological sites Describe project area and attach project plans	☐ Architecture/History survey is not needed

VI. SURVEY COMPLETED-Documentation required for submittal to TSS

ARCHAEOLOGY	HISTORY
☐ Project maps attached [most recent design] ☒ ASFR attached [**NO** archaeological sites(s) identified] ☐ Report attached [**NO** potentially eligible site(s) in project area] ☐ Report attached [potentially eligible site(s) avoided] ☐ Report attached - cemetery documentation ☐ Native American response letters & reports [Send four reports + # of copies for NA requests to district.]	☒ A/HSF attached [**NO** buildings/structures identified] ☐ A/HSF attached [potentially eligible buildings/structures identified.]

VII. EVALUATION COMPLETED-Documentation required for submittal to TSS

- ☐ Report attached [no arch site(s) eligible for NRHP]
- ☐ Report and DOE attached [arch site(s) eligible for NRHP]
- ☐ Report and draft DOE attached [arch site(s) eligible for NRHP—avoided through project redesign]
- ☐ DOE attached [no buildings/structure(s) eligible for NRHP]
- ☐ DOE attached [building/structure(s) eligible for NRHP]

VIII. COMMITMENTS

IX. PROJECT REVIEW

- ☒ No eligible properties in APE
- ☐ No effect on historic buildings and/or archaeological sites eligible for NRHP
- ☐ Eligible properties may be affected by project-go to Step 4: Assess effects and begin consultation

(BOA Project Manager)	DocuSigned by: Scott J. Lawry 5F484D7166924F8... (WisDOT Historic Preservation Officer)	DocuSigned by: Kimberly Cook 2F3FB9178D084A4... (State Historic Preservation Officer)
05-27-2021 (Date)	07 July 2021 (Date)	09 September 2021 (Date)
(Consultant Project Manager)		
5-27-2021 (Date)		

Brian Wayner

From: Palmer, Mallory K - DOT <malloryk.palmer@dot.wi.gov>
Sent: Tuesday, March 5, 2024 4:15 PM
To: Brian Wayner
Subject: FW: Completed Section 106: 0744-40-57; Appleton International Airport (ATW1007)

My final correspondence with CRT.

-Mallory

From: Cloud, Lynn - DOT <Lynn.Cloud@dot.wi.gov>
Sent: Monday, March 4, 2024 3:55 PM
To: Palmer, Mallory K - DOT <malloryk.palmer@dot.wi.gov>; Rumschlag, Samuel J - DOT <samuelj.rumschlag@dot.wi.gov>
Cc: Kaliszewski, Katherine N - DOT <katherinen.kaliszewski@dot.wi.gov>
Subject: RE: Completed Section 106: 0744-40-57; Appleton International Airport (ATW1007)

Once a section 106 is signed it is the official record and we cannot change any of the check boxes. The project decision is the most important box on the DT1635, I would not worry about it and proceed with its use.

From: Palmer, Mallory K - DOT <malloryk.palmer@dot.wi.gov>
Sent: Monday, March 04, 2024 11:26 AM
To: Cloud, Lynn - DOT <Lynn.Cloud@dot.wi.gov>; Rumschlag, Samuel J - DOT <samuelj.rumschlag@dot.wi.gov>
Cc: Kaliszewski, Katherine N - DOT <katherinen.kaliszewski@dot.wi.gov>
Subject: FW: Completed Section 106: 0744-40-57; Appleton International Airport (ATW1007)

Hi CRT,

BOA is putting together an environmental document using the Section 106 documentation below. I didn't catch this earlier, but in Section V there are two boxes checked in archeology. Any chance we can get an updated form?

Mallory K. Palmer
Aeronautical Environmental Coordinator
Wisconsin Department of Transportation | Bureau of Aeronautics
malloryk.palmer@dot.wi.gov | 608.261.5861
<< OLE Object: Picture (Device Independent Bitmap) >>

From: Cloud, Lynn - DOT <Lynn.Cloud@dot.wi.gov>
Sent: Thursday, September 9, 2021 3:25 PM
To: Trimble, Andrew - DOT <Andrew.Trimble@dot.wi.gov>
Cc: Palmer, Mallory K - DOT <malloryk.palmer@dot.wi.gov>; MeadHuntCRT <MeadHuntCRT@meadhunt.com>;

Kaliszewski, Katherine N - DOT <katherinen.kaliszewski@dot.wi.gov>; DOT BEES Cultural Resources <bees.cr@dot.wi.gov>
Subject: Completed Section 106: 0744-40-57; Appleton International Airport (ATW1007)

Attached is the signed section 106 for the above project. SHPO concurred with "No eligible properties in APE".

Please print for use in your environmental document. If the scope or activities of the undertaking should change the project will need to be re-evaluated for effects to historic properties and further consultation with BTS/CR is required.

<< File: 0744-40-57_SEC106.pdf >>
Cultural Resources
Wisconsin Department of Transportation
P.O. Box 7965
Madison, WI 53707-7965
DOTCulturalResources@dot.wi.gov

Lynn Cloud - (608) 266-0099
Katie Kaliszewski - (608-267-6693)

APPENDIX 5 - EXPLANATION OF AMBIENT SOUND TRAVEL

Sound is acoustic energy propagated in waves through a medium such as air. Sound waves have both amplitude and frequency (pitch). The standard unit of measurement of the magnitude of sound is the decibel (dB). Human hearing covers a large range of sound; therefore, a dB is measured on a logarithmic scale which compresses the wide range of sound to a more usable range of numbers. The human ear has its own sound frequency filtering mechanisms and the inclusion of an A after unit symbol dB indicates that the scale has been adjusted to reflect human hearing. In other words, the unit dBA correlates the magnitude of sound with how the human ear perceives sound.

It should be noted that when describing large amplitude impulsive sounds of extremely short duration, such as a gunshot, the total amount of acoustic energy created is an important consideration. Sounds of this nature are normally measured on the "C-weighted" scale (dBC), which gives nearly equal emphasis to sounds of most frequencies. The dBC scale is normally used in assessing noise such as gunshot noise in relatively close proximity to the source and a less relevant as the sound travels to a far-field receptor; for this reason, the dBA scale is used in this discussion.

The human sound perception scale ranges from 0 dBA, the threshold of human hearing, to 140 dBA. Table 1 represents dBA levels associated with various daily activities. A typical residential subdivision might have sound levels between 40 and 50 dBA, while the area along side of a busy freeway might be in the range of 70 to 80 dBA. The transition from a peaceful environment to a noisy environment is in the range of 50 to 70 dBA.

Table 1-Common Sound Sources and Corresponding Sound Levels

Sound Source	Sound Level (dBA)
Whisper	20
Quiet Residence	30
Residence	40
Speech Range	50-70
Cafeteria	80
Jackhammer	90
Loud Crowd Noise	100
Rock Concert	120
Jet Engine (75 feet away)	140

There are a number of factors that affect the propagation of outdoor sound such as the nature of the sound, distance, terrain, wave divergence, atmospheric absorption and ground attenuation. Not all of these factors are controllable. For a given sound emission, sound level control is achieved along a pathway in two primary ways: through distance or by inserting an obstruction in the pathway.

Sound levels decrease as the distance from the source increases. Sound radiating from a source in an undisturbed manner travels in spherical waves. As the sound wave travels away from the source, the sound energy is dispersed over a greater area and the magnitude of the sound decreases. The spherical spreading of the sound waves reduces the sound level by 6 dB per doubling of the distance

from the source of the sound. For example, a sound level of 96 dBA measured 1 foot from a source would decrease to 36 dBA a distance 1,000 ft from the source.

The second type of sound control consists of the use of obstructions such as walls or berms to intercept the sound. This forces sound waves to bend around the obstruction or diffract. Diffraction causes the sound waves to consume energy and thus reduces the sound level. To be effective, an obstruction like a berm must be at least as high as the line of sight to the source. An obstruction will provide an additional dBA of sound level reduction for every 2 feet of height added above the line-of-sight height.

Source: Appendix C-Sound in the Outdoor Environment, DEIS, Proposed Southwest Wisconsin Technical College Public Safety Training Center, Fennimore, Wisconsin

APPENDIX 6 - PRELIMINARY ENVIRONMENTAL ASSESSMENT COMMENTS AND LEGAL NOTICE

The purpose of the Preliminary Environmental Assessment was to consider the economic, social, and environmental effects of the proposed action and its consistency with local planning goals and objectives. This appendix includes responses to comments received on the Preliminary Environmental Assessment through June 11, 2024.

A copy of the Preliminary Environmental Assessment was provided to the agencies/organizations listed in Table A6-1, Agency/Organization Preliminary Environmental Assessment Distribution, on May 3, 2024. On May 14, 2024, a notice of availability and a notice offering the opportunity of a public hearing were published in The Appleton Post-Crescent newspaper, regarding the proposed improvements. A public information web site was also established that provided the Preliminary Environmental Assessment in a downloadable format. The web site allowed comments to be submitted electronically.

Table A6-1
Agency/Organization Preliminary Environmental Assessment Distribution

Federal Agencies	**Date Comments Received**
United States Department of Agriculture – Natural Resources Conservation Service	
United States Army Corps of Engineers	
United States Department of Housing & Urban Development	
United States Department of Interior – Fish and Wildlife Service	
United States Department of Transportation Federal Aviation Administration	
United States Environmental Protection Agency	5/3/24
State Agencies	
State Historical Society of Wisconsin	
Wisconsin Department of Natural Resources	6/10/24
Wisconsin Department of Transportation – Bureau of Aeronautics	
Wisconsin Department of Transportation – Environmental Process & Documentation Section	5/3/24
Local Governments/Agencies	
Appleton Public Library	
East Central Regional Planning Commission	
Outagamie County	
Appleton International Airport	
Community and Economic Development and County Owned Real Estate, Comprehensive/Long Range Planning	
County Clerk	
County Zoning Administrator	
Village of Greenville	

Comments have been broken down into the following categories:

- Comments Received From Agencies
- Comments Received From Public
- Comments Received Electronically

Copies of correspondence and the notice of availability and a notice offering the opportunity of a public hearing have been included at the end of this appendix.

Responses To Comments Received From Agencies

A summary of the comments is identified in bold type under each category. The response to the comment follows in standard text.

Wisconsin Department of Natural Resources – Matthew Schaeve
I did review the Preliminary EA for this project, and no I did not have any comments for you to include into the Final EA.

Comment noted.

Wisconsin Department of Transportation – Environmental Process & Documentation Section – Chris Egger
Received document. I'll look at it and let you know if I have any comments.

Comment noted.

United States Environmental Protection Agency – Auto Reply
Thank you for emailing the EPA Region 5 NEPA team. Your email has been received. If your correspondence is requesting review of a NEPA scoping document or an Environmental Assessment, your project request will be assigned to one of our NEPA staff for review and comment, and our program staff will be in touch. Please note that due to current staffing constraints, not all scoping documents and Environmental Assessments will be reviewed by the Region 5 NEPA program.

Comment noted.

Responses To Comments Received By Public

No comments received.

Responses To Comments Received Electronically

No comments received.

LocaliQ
Wisconsin
GANNETT

PO Box 630848 Cincinnati, OH 45263-0848

AFFIDAVIT OF PUBLICATION

Westwood
1 NORTH SYSTEMS DRIVE
Appleton WI 54914

STATE OF WISCONSIN, COUNTY OF BROWN

I being duly sworn, doth depose and say that I am an authorized representative of the Appleton Post Crescent, a newspaper published at Appleton, Wisconsin; and that an advertisement of which the annexed is a true copy, taken from said paper, has been published in said newspaper in the issues dated:

05/14/2024

That said newspaper was regularly issued and circulated on those dates and that the fees charged are legal.

Sworn to and subscribed before on 05/14/2024

Legal Clerk

Notary, State of WI, County of Brown

2-14-28

My commission expires

Publication Cost:	$86.56	
Order No:	10166964	# of Copies:
Customer No:	1443600	0
PO #:	LWIX0099972	

THIS IS NOT AN INVOICE!

Please do not use this form for payment remittance.

KEEGAN MORAN
Notary Public
State of Wisconsin

NOTICE OF AVAILABILITY OF A
PRELIMINARY ENVIRONMENTAL
ASSESSMENT
AND
NOTICE OF OPPORTUNITY FOR A
PUBLIC HEARING
IN THE MATTER OF STATE AND
FEDERAL AID
FOR IMPROVEMENTS AT

Appleton International Airport
Appleton

A petition resolution requesting state and federal financial assistance has been filed by Outagamie County with the Wisconsin Department of Transportation, Bureau of Aeronautics to help carry out the following development at the Appleton International Airport, Appleton, Wisconsin:

The proposed construction of a geothermal system as an energy efficient means of heating and cooling the passenger terminal building and the new addition to the passenger terminal building. The proposed geothermal system would be located near the passenger terminal building on airport property.

ALL INTERESTED PERSONS are notified of the availability of a Preliminary Environmental Assessment of the effects of the proposed improvements. The Preliminary Environmental Assessment is available for examination at the Appleton Public Library, the office of the Airport Director, W6390 Challenger Drive, Suite 201, and the Outagamie County Administration office.

Comments regarding the environmental impacts and effects of the proposed improvement are invited to be submitted to the Department of Transportation by June 3, 2024. Comments may be mailed to Andrew Trimble, Airport Development Engineer at the address given below.

Persons with an interest in or knowledge about historical and archaeological resources in the project area developed under this Environmental Assessment are invited to include such information as part of any comments submitted.

ALL INTERESTED PERSONS are further advised of an opportunity to request a public hearing by the Wisconsin Department of Transportation, Bureau of Aeronautics. A public hearing may be requested by individuals to whom the proposed project is of significant concern. The hearing request should indicate the concerns and reasons why a hearing is requested. A public hearing may be held if it is determined that there is substantial public interest to warrant a hearing.

Before making a request for a public hearing, persons are encouraged to contact Andrew Trimble, at 608-267-0454 to express their views and discuss those aspects of the proposal that are of concern. If a hearing is held, it will consider the social, economic and environmental effects of the proposed improvements and whether the improvement is or is not in the public interest and consistent with the goals and objectives of area planning.

A request for a public hearing may be made by submitting a written request to the Airport Engineering Section Chief at the address given below on or before June 3, 2024. If a hearing is held, notice of the time and place of the hearing will be published in area newspapers.

WISCONSIN DEPARTMENT OF TRANSPORTATION
BUREAU OF AERONAUTICS
P. O. Box 7914
Madison, Wisconsin 53707-7914
WNAXLP
May 14 2024
LWIX0099972

Brian Wayner

From: Schaeve, Matthew D - DNR <Matthew.Schaeve@wisconsin.gov>
Sent: Monday, June 10, 2024 3:01 PM
To: Brian Wayner
Subject: RE: Appleton International Airport - Preliminary Environmental Assessment - Proposed Geothermal System for the passenger terminal

Hello Brian,

I did review the Preliminary EA for this project, and no I did not have any comments for you to include into the Final EA. My only comment would be that it was a well done document that covered the issues, and as long as the process laid out in the EA is followed everything should work out.

Thank you,

We are committed to service excellence.
Visit our survey at http://dnr.wi.gov/customersurvey to evaluate how I did.

Matt Schaeve
Environmental Analysis & Review Specialist
Bureau of Environmental Analysis & Sustainability
Wisconsin Department of Natural Resources
2984 Shawano Ave., Green Bay, WI 54313
Phone: (920) 366-1544
Fax: (920) 662-5413
matthew.schaeve@wisconsin.gov

dnr.wi.gov

From: Brian Wayner <Brian.Wayner@westwoodps.com>
Sent: Monday, June 10, 2024 2:46 PM
To: Schaeve, Matthew D - DNR <Matthew.Schaeve@wisconsin.gov>
Subject: RE: Appleton International Airport - Preliminary Environmental Assessment - Proposed Geothermal System for the passenger terminal

Hi Matt,

I'm putting together the final EA for the proposed geothermal system for the passenger terminal at Appleton International Airport. I wanted to check in with you before I finalize the document and send it for BOA/FAA review. Do you have any comments on the preliminary EA you would like me to include in the final EA?

Brian Wayner, P.E.
Service Leader, Environmental
brian.wayner@westwoodps.com
Licensed in WI

direct (920) 830-6141
main (920)-735-6900
cell (920) 851-0366

Westwood
1 Systems Drive
Appleton, WI 54914
westwoodps.com

From: Schaeve, Matthew D - DNR <Matthew.Schaeve@wisconsin.gov>
Sent: Wednesday, May 15, 2024 9:51 AM
To: Brian Wayner <Brian.Wayner@westwoodps.com>
Cc: Palmer, Mallory K - DOT <malloryk.palmer@dot.wi.gov>
Subject: RE: Appleton International Airport - Preliminary Environmental Assessment - Proposed Geothermal System for the passenger terminal

Brian,

Sorry, you can disregard that question. I see that June 3 is the deadline, I should've read the attached letter first.

Thanks!

Matt Schaeve
Phone: (920) 366-1544
matthew.schaeve@wisconsin.gov

From: Schaeve, Matthew D - DNR
Sent: Wednesday, May 15, 2024 9:49 AM
To: Brian Wayner <Brian.Wayner@westwoodps.com>
Cc: Palmer, Mallory K - DOT <malloryk.palmer@dot.wi.gov>
Subject: RE: Appleton International Airport - Preliminary Environmental Assessment - Proposed Geothermal System for the passenger terminal

Hi Brian,

I haven't had a chance to review this yet, but I'm trying to get to it. Could you tell me for how long the "comment window" will be open for?

Thanks,

Matt Schaeve
Environmental Analysis & Review Specialist
Bureau of Environmental Analysis & Sustainability
Wisconsin Department of Natural Resources
2984 Shawano Ave., Green Bay, WI 54313
Phone: (920) 366-1544
Fax: (920) 662-5413
matthew.schaeve@wisconsin.gov

dnr.wi.gov

From: Brian Wayner <Brian.Wayner@westwoodps.com>
Sent: Friday, May 3, 2024 9:56 AM
To: Schaeve, Matthew D - DNR <Matthew.Schaeve@wisconsin.gov>
Cc: Palmer, Mallory K - DOT <malloryk.palmer@dot.wi.gov>
Subject: Appleton International Airport - Preliminary Environmental Assessment - Proposed Geothermal System for the passenger terminal

Matt,

The Appleton International Airport, in cooperation with the Federal Aviation Administration and the Wisconsin Department of Transportation Bureau of Aeronautics, is soliciting comments on a Preliminary Environmental Assessment for a proposed geothermal system project. Additional information can be found in the attached correspondence.

A PDF copy of the Preliminary Environmental Assessment can be downloaded from the link: Preliminary Environmental Assessment - Geothermal System.pdf or from the project website: https://westwoodps.com/appleton-international-airport . If you would prefer a paper copy of the Preliminary Environmental Assessment, please let me know and one will be mailed to you.

If you have any questions, please contact me at 920-830-6141 or at brian.wayner@westwoodps.com.

Brian Wayner, P.E.
Service Leader, Environmental
brian.wayner@westwoodps.com
Licensed in WI

direct (920) 830-6141
main (920)-735-6900
cell (920) 851-0366

Westwood
1 Systems Drive
Appleton, WI 54914
westwoodps.com

Brian Wayner

From: Egger, Christopher R - DOT <christopher.egger@dot.wi.gov>
Sent: Friday, May 3, 2024 11:10 AM
To: Brian Wayner
Subject: RE: Appleton International Airport - Preliminary Environmental Assessment - Proposed Geothermal System for the passenger terminal

Hi Brian,

Electronic copy is good with me, I appreciate you sending this over.

I'll look at it and let you know if I have any comments.

Thanks,

Chris Egger
Environmental Process and Document Specialist
Wisconsin Department of Transportation
(608) 266-0208 office
Christopher.Egger@dot.wi.gov

From: Brian Wayner <Brian.Wayner@westwoodps.com>
Sent: Friday, May 3, 2024 10:37 AM
To: Egger, Christopher R - DOT <christopher.egger@dot.wi.gov>
Subject: Appleton International Airport - Preliminary Environmental Assessment - Proposed Geothermal System for the passenger terminal

Chris,

The Appleton International Airport, in cooperation with the Federal Aviation Administration and the Wisconsin Department of Transportation Bureau of Aeronautics, is soliciting comments on a Preliminary Environmental Assessment for a proposed geothermal system project. Additional information can be found in the attached correspondence.

A PDF copy of the Preliminary Environmental Assessment can be downloaded from the link: Preliminary Environmental Assessment - Geothermal System.pdf or from the project website: https://westwoodps.com/appleton-international-airport . If you would prefer a paper copy of the Preliminary Environmental Assessment, please let me know and one will be mailed to you.

If you have any questions, please contact me at 920-830-6141 or at brian.wayner@westwoodps.com.

Brian Wayner, P.E.
Service Leader, Environmental
brian.wayner@westwoodps.com
Licensed in WI

direct (920) 830-6141
main (920)-735-6900
cell (920) 851-0366

Westwood
1 Systems Drive
Appleton, WI 54914
westwoodps.com

Brian Wayner

From: EPA Region 5 NEPA Program <R5NEPA@epa.gov>
Sent: Friday, May 3, 2024 10:15 AM
To: Brian Wayner
Subject: Automatic reply: Appleton International Airport - Preliminary Environmental Assessment - Proposed Geothermal System for the passenger terminal

Thank you for emailing the EPA Region 5 NEPA team. Your email has been received.

If your correspondence is requesting review of a NEPA scoping document or an Environmental Assessment, your project request will be assigned to one of our NEPA staff for review and comment, and our program staff will be in touch.

Please note that due to current staffing constraints, not all scoping documents and Environmental Assessments will be reviewed by the Region 5 NEPA program.

Thanks for contacting us.

-The EPA Region 5 NEPA team
https://www.epa.gov/nepa/forms/contact-us-about-national-environmental-policy-act