Appendices

A. Preparer & Qualifications
B. Agencies/Tribes Consulted
C. Public Involvement
D. Sponsor Land Use Letter
E. Section 106 Consultation
F. Wetland Delineation, Consultation and Preliminary JD
G. Affected Environment and Area Photography

Appendix A. Preparer and Qualifications

Mr. Gary Behrens
Education: B.S. Biology, Auburn University, Montgomery, Alabama, 1980

Experience: Mr. Behrens is an environmental professional with 26 years of experience, has completed projects in 13 states and has wide background in all aspects of environmental projects including wetland delineation, mitigation planning and permitting.

Responsibility: Mr. Behrens is the lead technical analyst and responsible for assisting with Environmental Assessment preparation and documentation.

Mr. Steve Marshall
Education: B.S. Aviation Management, Metropolitan State College of Denver, Colorado, 1997

Experience: Mr. Marshall has more than 13 years of airport consulting and industry experience. He is responsible for developing master plans and airport layout planning, land use planning, airport business planning and environmental analyses. Mr. Marshall has assisted with the preparation of 7 Environmental Assessments.

Responsibility: Mr. Marshall is a technical analyst and responsible for assisting with Environmental Assessment preparation and documentation.

A**ppendix B: Agencies/Tribes Consulted**

Correspondence was sent by Preparer to:
(Note: Each correspondence letter fronts each response letter (if a response was received). Attachments to each letter (2) are found at the front of this appendix.)

Mr. Charles F Soules, P.E., Public Works Director, City of Lawrence
Mr. Keith Browing, P.E., Public Works Director/County Engineer, Douglas County
Mr. Larry Shepherd, USEPA
Ms. Heather Whitlaw, USFWS
Mr. John Mitchell, KDHE
Ms. Emma Foltz, KDWP
Mr. Nick Chevance, USNPS
Mr. Coleen Davison, NRCS
Mr. USACE Representative, USACE
Ms. Kim Gant, SHPO, Kansas Historical Society

Correspondence was sent by FAA to:
(Note: FAA template letter and attachments front letters, responses {2} are found following these.

Dr. Bruce Obermeyer, NAGPRA Representative, Delaware Tribe of Oklahoma
Ms. Robin Dushane, Cultural Preservation Director, Eastern Shawnee Tribe
Ms. Bobi Roush, Cultural Preservation Department, Iowa Tribe of the Oklahoma
Ms. Crystal Douglas, Historic Preservation Officer, Kaw Nation
Mr. George Strack, THPO Miami Tribe of Oklahoma
Mr. Tony Provost, THPO, Omaha Tribe
Mr. Barker Fariss, Ph D., Director, THPO, Osage Nation
Ms. Suzy Knife Chief, Youth Services Coordinator, Pawnee Nation
Ms. Lana Gravatt, THPO, Yankton Sioux Tribe of South Dakota

Within the course of the EA process, the purpose and need was modified:

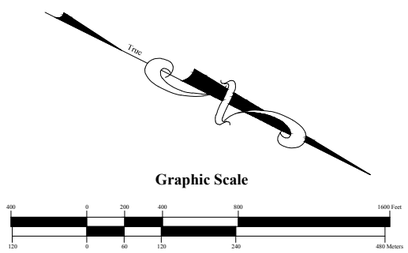
-The drainage study area was revised from 120 acres to 67 acres
-The perimeter fence route was modified

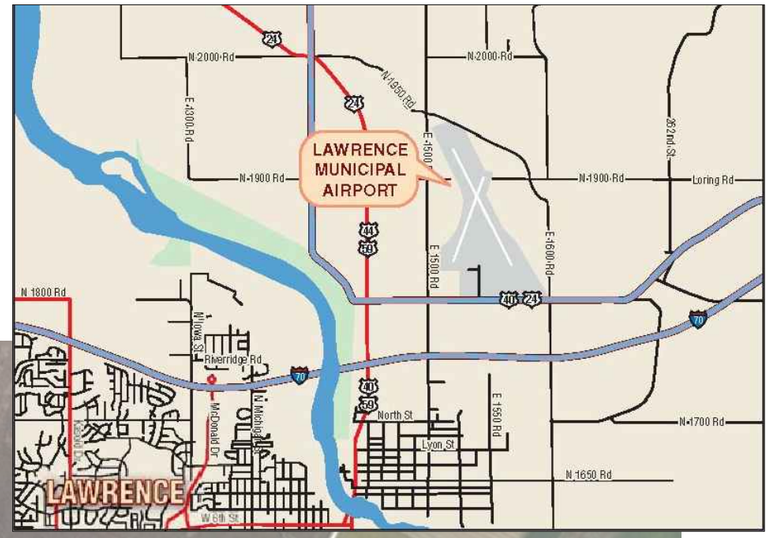
Responses to consultation to advise of this change finalized this appendix:
(Note: A depiction of the above modification fronts the first response)

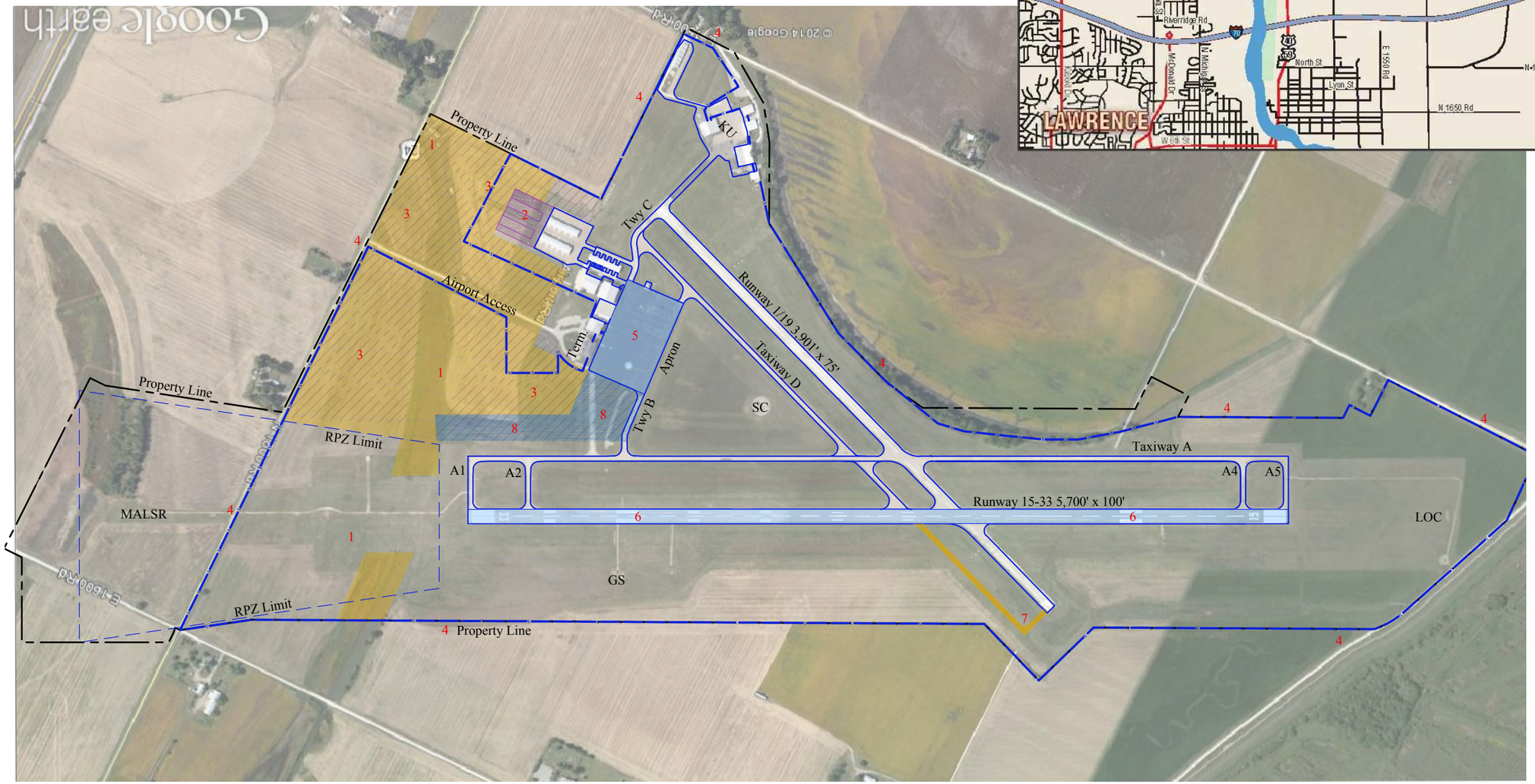
Ms. Kim Gant, SHPO
Mr. Tim Weston , SHPO
Mr. John Mitchell, KDHE
Mr. Matthew Sailor, USACE
Ms. Michelle McNulty, USFWS

Planned Improvements

Number	Project
1	Perform Drainage Study on a Portion of the Airport (±67 Ac)
2	Construct T-Hangars and Access Taxiways (±11,650 sqyds)
3	Prepare (Grade and Disturb) Area for Planned Development (±50 Ac)
4	Construct Perimeter Fence (±27,400 lf)
5	Rehabilitate General Aviation Apron (±32,350 sqyds)
6	Rehabilitate (and Strengthen) Runway 15-33 (±63,333 sqyds)
7	Extend Taxiway D to Full-Parallel (±4,950 sqyds)
8	Construct Phase I (±16,500 sqyds) and II (±23,400 sqyds) GA Aprons







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1776 South Jackson Street / Suite 950
Denver, Colorado 80210-2852
303.782.0840 / 303.782.0845 fax
www.ADGAirports.com

Lawrence Municipal Airport
Lawrence, Kansas

AIP Project No. 03-20-0047-17-2014 (EA)

No.	Revision	Ckd	Date

Project No.:	LWC		
Designed By:	JES		
Drawn By:	SPM		
Approved By:	DPH		
Date:	March 2014		

Environmental Assesssment
Projects; Purpose/Need
Aerial Backgroud

Exhibit:

I

of II Exhibits

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May 14, 2014

Mr. Charles F. Soules, P.E.
Director of Public Works
City of Lawrence
6 East 6th Street
Lawrence, Kansas 66044

Subject: Lawrence Municipal Airport, City of Lawrence, Kansas
FAA AIP Project No. 03-20-0047-17-2014
Request for Comment; Environmental Assessment

Dear Mr. Soules:

The City of Lawrence and the Lawrence Municipal Airport has initiated a National Environmental Policy Act (NEPA) Environmental Assessment (EA) process for the following proposed federal actions:

- Perform drainage study on a portion of the airport (±120 acres)
- Construct T-hangar and access taxiways (±11,650 square yards)
- Prepare (grade and disturb) area for planned landside development (±50 acres)
- Construct perimeter fencing (±29,500 linear feet)
- Rehabilitate general aviation apron (±32,350 square yards)
- Rehabilitate (and strengthen as a consequence) Runway 15-33 (±63,333 square yards)
- Extend Taxiway D to full parallel (±4,950 square yards)
- Construct Phase I (±16,500) and II (±23,400 square yards) GA Aprons

The Lawrence Municipal Airport is listed in the FAA's National Plan of Integrated Airport Systems (NPIAS) as a general aviation airport. The airport site comprises approximately 500 acres of fee simple property ownership, situated within Section 17, Township 12 South, and Range 20 East. The Lawrence Municipal Airport is located approximately 2 miles north of the City of Lawrence. This airport accommodates general aviation and military aircraft.

Enclosed you will find airport layout figures (USGS topo and Aerial) depicting the proposed federal actions. The proposed improvements are shown in color and are tabulated below the drawing view. The proposed federal actions are depicted on the approved Airport Layout Plan, envisioned comply with FAA grant assurances, and to provide for the safety of flight operations and demand accommodation in compliance with FAA guidance.

The drainage study (Improvement No. 1) is a study only with no on-the-ground impacts. T-hangars (Improvement No. 2) are aircraft storage facilities with the necessary access pavements. The lightly-shaded brown cross-hatched area (Improvement No. 3) indicates an area of potential disturbance for future aviation-related tenant occupation. Occupation in this instance perhaps includes fill to level

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the ground for future large (i.e. 100 feet by 100 feet) hangars/buildings, auto access and parking and/or aircraft parking area; the scope and nature of tenant improvements are currently not known. A combination of wildlife fencing and perhaps chain-link nearer to aviation facilities (Improvement No. 4) is envisioned for fencing. Rehabilitation of both the general aviation apron (Improvement No. 5) and Runway 15-33 (Improvement No. 6) are in-place reconstruction of asphalt pavements. Extension of Taxiway D (Improvement No. 7) to full-parallel envisioned is to discourage aircraft back-taxi movements. Finally, new phased-development apron (Improvement No. 8) is envisioned to accommodate potential demand.

It should be noted that the areas within which all proposed federal actions are to occur are currently on existing airport property that has been historically disturbed for farming. The area immediately surrounding the airport is cultivated for crops, primarily soybeans and corn.

We are evaluating environmental issues concerning these proposed federal actions. Please consider this our formal request for you to identify any environmental issues which may be of importance to the proposed federal actions. We respectfully request your comments within thirty (30) days following your receipt of this correspondence. Your comments are important for this process and will be appended to the Draft and Final EA documents. If you have questions or require further information regarding this request, please contact me at (601) 932-6920 or at gbehrens@adgairports.com.

Sincerely,

FOR

Gary K. Behrens
Airport Environmental Planner

Enclosures

AIRPORT
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May 14, 2014

Mr. Keith Browing, P.E.
Public Works Director/County Engineer
Douglas County
1242 Massachusetts Street
Lawrence, Kansas 66044

Subject: Lawrence Municipal Airport, City of Lawrence, Kansas
FAA AIP Project No. 03-20-0047-17-2014
Request for Comment; Environmental Assessment

Dear Mr. Soules:

The City of Lawrence and the Lawrence Municipal Airport has initiated a National Environmental Policy Act (NEPA) Environmental Assessment (EA) process for the following proposed federal actions:

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- Rehabilitate (and strengthen as a consequence) Runway 15-33 (±63,333 square yards)
- Extend Taxiway D to full parallel (±4,950 square yards)
- Construct Phase I (±16,500) and II (±23,400 square yards) GA Aprons

The Lawrence Municipal Airport is listed in the FAA's National Plan of Integrated Airport Systems (NPIAS) as a general aviation airport. The airport site comprises approximately 500 acres of fee simple property ownership, situated within Section 17, Township 12 South, and Range 20 East. The Lawrence Municipal Airport is located approximately 2 miles north of the City of Lawrence. This airport accommodates general aviation and military aircraft.

Enclosed you will find airport layout figures (USGS topo and Aerial) depicting the proposed federal actions. The proposed improvements are shown in color and are tabulated below the drawing view. The proposed federal actions are depicted on the approved Airport Layout Plan, envisioned comply with FAA grant assurances, and to provide for the safety of flight operations and demand accommodation in compliance with FAA guidance.

The drainage study (Improvement No. 1) is a study only with no on-the-ground impacts. T-hangars (Improvement No. 2) are aircraft storage facilities with the necessary access pavements. The lightly-shaded brown cross-hatched area (Improvement No. 3) indicates an area of potential disturbance for future aviation-related tenant occupation. Occupation in this instance perhaps includes fill to level

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the ground for future large (i.e. 100 feet by 100 feet) hangars/buildings, auto access and parking and/or aircraft parking area; the scope and nature of tenant improvements are currently not known. A combination of wildlife fencing and perhaps chain-link nearer to aviation facilities (Improvement No. 4) is envisioned for fencing. Rehabilitation of both the general aviation apron (Improvement No. 5) and Runway 15-33 (Improvement No. 6) are in-place reconstruction of asphalt pavements. Extension of Taxiway D (Improvement No. 7) to full-parallel envisioned is to discourage aircraft back-taxi movements. Finally, new phased-development apron (Improvement No. 8) is envisioned to accommodate potential demand.

It should be noted that the areas within which all proposed federal actions are to occur are currently on existing airport property that has been historically disturbed for farming. The area immediately surrounding the airport is cultivated for crops, primarily soybeans and corn.

We are evaluating environmental issues concerning these proposed federal actions. Please consider this our formal request for you to identify any environmental issues which may be of importance to the proposed federal actions. We respectfully request your comments within thirty (30) days following your receipt of this correspondence. Your comments are important for this process and will be appended to the Draft and Final EA documents. If you have questions or require further information regarding this request, please contact me at (601) 932-6920 or at gbehrens@adgairports.com.

Sincerely,

FOR-

Gary K. Behrens
Airport Environmental Planner

Enclosures

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May 14, 2014

Mr. Larry Shepard
U.S. Environmental Protection Agency
Region 7
Environmental Services Division
11201 Renner Boulevard
Lenexa, Kansas 66219

Subject: Lawrence Municipal Airport, City of Lawrence, Kansas
FAA AIP Project No. 03-20-0047-17-2014
Request for Comment; Environmental Assessment

Dear Mr. Shepard:

The City of Lawrence and the Lawrence Municipal Airport has initiated a National Environmental Policy Act (NEPA) Environmental Assessment (EA) process for the following proposed federal actions:

- Perform drainage study on a portion of the airport (±120 acres)
- Construct T-hangar and access taxiways (±11,650 square yards)
- Prepare (grade and disturb) area for planned landside development (±50 acres)
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- Extend Taxiway D to full parallel (±4,950 square yards)
- Construct Phase I (±16,500) and II (±23,400 square yards) GA Aprons

The Lawrence Municipal Airport is listed in the FAA's National Plan of Integrated Airport Systems (NPIAS) as a general aviation airport. The airport site comprises approximately 500 acres of fee simple property ownership, situated within Section 17, Township 12 South, and Range 20 East. The Lawrence Municipal Airport is located approximately 2 miles north of the City of Lawrence. This airport accommodates general aviation and military aircraft.

Enclosed you will find airport layout figures (USGS topo and Aerial) depicting the proposed federal actions. The proposed improvements are shown in color and are tabulated below the drawing view. The proposed federal actions are depicted on the approved Airport Layout Plan, envisioned comply with FAA grant assurances, and to provide for the safety of flight operations and demand accommodation in compliance with FAA guidance.

The drainage study (Improvement No. 1) is a study only with no on-the-ground impacts. T-hangars (Improvement No. 2) are aircraft storage facilities with the necessary access pavements. The lightly-shaded brown cross-hatched area (Improvement No. 3) indicates an area of potential disturbance for future aviation-related tenant occupation. Occupation in this instance perhaps includes fill to level

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the ground for future large (i.e. 100 feet by 100 feet) hangars/buildings, auto access and parking and/or aircraft parking area; the scope and nature of tenant improvements are currently not known. A combination of wildlife fencing and perhaps chain-link nearer to aviation facilities (Improvement No. 4) is envisioned for fencing. Rehabilitation of both the general aviation apron (Improvement No. 5) and Runway 15-33 (Improvement No. 6) are in-place reconstruction of asphalt pavements. Extension of Taxiway D (Improvement No. 7) to full-parallel envisioned is to discourage aircraft back-taxi movements. Finally, new phased-development apron (Improvement No. 8) is envisioned to accommodate potential demand.

It should be noted that the areas within which all proposed federal actions are to occur are currently on existing airport property that has been historically disturbed for farming. The area immediately surrounding the airport is cultivated for crops, primarily soybeans and corn.

We are evaluating environmental issues concerning these proposed federal actions. Please consider this our formal request for you to identify any environmental issues which may be of importance to the proposed federal actions. We respectfully request your comments within thirty (30) days following your receipt of this correspondence. Your comments are important for this process and will be appended to the Draft and Final EA documents. If you have questions or require further information regarding this request, please contact me at (601) 932-6920 or at gbehrens@adgairports.com.

Sincerely,

FOR

Gary K. Behrens
Airport Environmental Planner

Enclosures

Gary K. Behrens

From: Summerlin, Joe [summerlin.joe@epa.gov]
Sent: Monday, June 16, 2014 8:44 AM
To: gbehrens@adgairports.com
Subject: Lawrence Municipal Airport, City of Lawrence, Kansas

Dear Mr. Behrens:

This letter corresponds to your letter dated May 14, 2014 concerning the Lawrence Municipal Airport in Lawrence, Kansas. Thank you for involving the Environmental Protection Agency (EPA) during the consideration of environmental impacts either to or from this project.

In evaluating this action, I referred to EPA Region 7's NEPAssist database for spatial relationships of environmentally regulated facilities and remediation sites. No issues were found that should interfere with the planned project. For further information, please visit EPA's NEPAssist mapping tool http://nepassisttool.epa.gov/nepassist/entry.aspx.

In the event that there are jurisdictional waters and or wetlands of the United States impacted by the proposed action, we recommend that any mitigation should occur in the same HUC 8 or smaller watershed as the location of project impacts. We recommend that you contact the appropriate authorities at the US Army Corps of Engineers to determine whether a CWA Section 404 permit may be required for this action.

In addition, other environmental impacts such as increased air traffic, additional green-house-gas emissions, changes in traffic patterns or routes, noise, and increased storm water runoff may want to be evaluated. EPA also recommends consultation from U.S. Fish and Wildlife to determine if there may be impacts to threatened or endangered species.

If you have other questions, you can contact me at (913) 551-7029 or via email at summerlin.joe@epa.gov.

Sincerely,

Joe Summerlin
US EPA R7
NEPA Team
11201 Renner Blvd.
Lenexa, KS 66219

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May 14, 2014

Ms. Heather Whitlaw
Field Supervisor
US Department of Fish and Wildlife
Kansas Ecological Field Services Office
2609 Anderson Avenue
Manhattan, Kansas 66502

Subject: Lawrence Municipal Airport, City of Lawrence, Kansas
FAA AIP Project No. 03-20-0047-17-2014
Request for Comment; Environmental Assessment

Dear Ms. Whitlaw:

The City of Lawrence and the Lawrence Municipal Airport has initiated a National Environmental Policy Act (NEPA) Environmental Assessment (EA) process for the following proposed federal actions:

- Perform drainage study on a portion of the airport (±120 acres)
- Construct T-hangar and access taxiways (±11,650 square yards)
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- Extend Taxiway D to full parallel (±4,950 square yards)
- Construct Phase I (±16,500) and II (±23,400 square yards) GA Aprons

The Lawrence Municipal Airport is listed in the FAA's National Plan of Integrated Airport Systems (NPIAS) as a general aviation airport. The airport site comprises approximately 500 acres of fee simple property ownership, situated within Section 17, Township 12 South, and Range 20 East. The Lawrence Municipal Airport is located approximately 2 miles north of the City of Lawrence. This airport accommodates general aviation and military aircraft.

Enclosed you will find airport layout figures (USGS topo and Aerial) depicting the proposed federal actions. The proposed improvements are shown in color and are tabulated below the drawing view. The proposed federal actions are depicted on the approved Airport Layout Plan, envisioned comply with FAA grant assurances, and to provide for the safety of flight operations and demand accommodation in compliance with FAA guidance.

The drainage study (Improvement No. 1) is a study only with no on-the-ground impacts. T-hangars (Improvement No. 2) are aircraft storage facilities with the necessary access pavements. The lightly-shaded brown cross-hatched area (Improvement No. 3) indicates an area of potential disturbance for future aviation-related tenant occupation. Occupation in this instance perhaps includes fill to level

the ground for future large (i.e. 100 feet by 100 feet) hangars/buildings, auto access and parking and/or aircraft parking area; the scope and nature of tenant improvements are currently not known. A combination of wildlife fencing and perhaps chain-link nearer to aviation facilities (Improvement No. 4) is envisioned for fencing. Rehabilitation of both the general aviation apron (Improvement No. 5) and Runway 15-33 (Improvement No. 6) are in-place reconstruction of asphalt pavements. Extension of Taxiway D (Improvement No. 7) to full-parallel envisioned is to discourage aircraft back-taxi movements. Finally, new phased-development apron (Improvement No. 8) is envisioned to accommodate potential demand.

We have reviewed the U.S. Fish and Wildlife Service Threatened and Endangered Species listing information for Douglas County, Kansas and have noted that the Pallid Sturgeon *(Scaphirhynchus albus)* is listed as endangered, while the Mead's Milkweed *(Asclepias meadii)* and Western Prairie Fringed Orchid *(Platanthera praeclara)* are listed as threatened and Sprague's Pipit *(Anthus spragueii)* is listed as a candidate specie. It should be noted that there is not a suitable aquatic habitat located on or in the immediate vicinity of the airport that is capable of supporting the Pallid Sturgeon *(Scaphirhynchus albus)*.

Based on site reconnaissance there is a potential wetland habitat / "other waters of the U.S." identified within the select proposed federal action impact areas. The existence of wetland habitat may be confirmed by a formal wetland delineation, and a request for 'jurisdictional determination' by the U.S. Army Corps of Engineers.

It should be noted that the areas within which all proposed federal actions are to occur are currently on existing airport property that has been historically disturbed for farming. The area immediately surrounding the airport is cultivated for crops, primarily soybeans and corn.

We are evaluating environmental issues concerning these proposed federal actions. Please consider this our formal request for you to identify any environmental issues which may be of importance to the proposed federal actions. We respectfully request your comments within thirty (30) days following your receipt of this correspondence. Your comments are important for this process and will be appended to the Draft and Final EA documents. If you have questions or require further information regarding this request, please contact me at (601) 932-6920 or at gbehrens@adgairports.com.

Sincerely,

FOR

Gary K. Behrens
Airport Wildlife Biologist

Enclosures

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Kansas Ecological Services Field Office
2609 Anderson Avenue
Manhattan, Kansas 66502

June 16, 2014

Gary Behrens, Airport Wildlife Biologist
Airport Development Group
1776 South Jackson Street, Suite 950
Denver, CO 80210

RE: Lawrence Municipal Airport FAA AIP Project No. 03-20-0047-17-2014
FWS Tracking # 2014-CPA-0411

Dear Mr. Behrens:

This is in response to your letter dated May 14, 2014, received by this office on May 19, 2014 requesting comment on the proposed airport improvement projects at the Lawrence Municipal Airport, located in Douglas County, Kansas.

In accordance with section 7(c) of the Endangered Species Act, it has been determined that the federally-listed Mead's milkweed (*Asclepias meadii*), and the western prairie fringed orchid (*Platanthera praeclara*) may occur in the project area. If the project may affect listed species, the federal funding/permitting agency should initiate section 7 consultation with this office.

If warm season, native grasslands or hay meadows are present and will be disturbed or removed by the project, we recommend that a qualified botanist inspect the proposed site in early June to determine the presence of suitable habitat and the federally-listed plant species prior to ground disturbing activities. If these plants are present within the project boundaries, project construction may adversely affect the species. The Kansas Biological Survey, 2041 Constant Avenue, Lawrence, Kansas 66047-2906, (785) 864-1538 may be contacted for assistance in determining the necessity of and protocols for plant surveys.

The proposed project lies within the range of the **northern long-eared bat** (*Myotis septentrionalis*), a species that is currently proposed for listing as federally endangered. Recently white-nose syndrome (WNS), a novel fungal pathogen, has caused serious declines in the northern long-eared bat population in the northeastern U.S. WNS has not been documented in Kansas, but the full extent of the impacts from WNS in other areas of the country is not yet known.

During winter, northern long-eared bats hibernate in caves and abandoned mines. Summer habitat requirements for the species are not well defined but the following are considered important:

(1) Roosting habitat in dead or live trees and snags with cavities, peeling or exfoliating bark, split tree trunk and/or branches, which may be used as maternity roost areas;
(2) Foraging habitat in upland and lowland woodlots and tree lined corridors;
(3) Occasionally they may roost in structures like barns and sheds.

It appears that habitat exhibiting the characteristics described above may be present at the proposed project site. We recommend that trees exhibiting any of the characteristics listed above, as well as any wooded areas, or tree lined corridors be saved wherever possible. However, if these areas cannot be avoided, they should only be cleared between November 1 and February 28. If implementation of the seasonal tree cutting restriction is not possible, summer surveys should be conducted to document the presence, or likely absence of the northern long-eared bat within the project area during the summer. Current USFWS guidance and recommendations for the NLEB can be found at the following link: (http://www.fws.gov/midwest/endangered/mammals/nlba/pdf/NLEBinterimGuidance6Jan2014.pdf).

Survey guidance protocols can be found in Appendix B of the NLEB interim guidance document. These guidelines for NLEB are in development, and may change as new information becomes available.

Construction and operational activities should avoid wetlands, streams, and riparian woodlands to the maximum extent possible. All construction rights-of-way should be surveyed for the presence of marshes and other wetland habitat types. All disturbed riparian areas should be revegetated with native plants as soon as possible after the disturbance occurs. Species composition following revegetation should parallel that which existed prior to the disturbance.

If a permit from the Corps of Engineers is required, the USFWS will be given the opportunity to review the public notice on the proposed action and provide additional comments at that time. Section 404 guidelines require the sequence of avoidance of impacts, minimization of impacts and compensation for unavoidable impacts. When we review the public notice we will request information on alternatives considered, how the project avoided and minimized impacts to aquatic ecosystems, and the compensatory mitigation proposal, if one is required by the Corps.

The Migratory Bird Treaty Act prohibits the taking, killing, possession, and transportation, (among other actions) of migratory birds, their eggs, parts, and nests, except when specifically permitted by regulations. While the Act has no provision for allowing unauthorized take, the USFWS realizes that some birds may be killed during project construction even if all known reasonable and effective measures to protect birds are used. The USFWS Office of Law Enforcement carries out its mission to protect migratory birds through investigations and enforcement, as well as by fostering relationships with individuals, companies, and industries that have taken effective steps to avoid take of migratory birds, and by encouraging others to implement measures to avoid take of migratory birds. It is not possible to absolve individuals, companies, or agencies from liability even if they implement bird mortality avoidance or other similar protective measures. However, the Office of Law Enforcement focuses its resources on investigating and prosecuting individuals and companies that take migratory birds without identifying and implementing all reasonable, prudent and effective measures to avoid that take.

Companies are encouraged to work closely with Service biologists to identify available protective measures when developing project plans and/or avian protection plans, and to implement those measures prior to/during construction or similar activities.

Thank you for this opportunity to comment on the proposal. If we can be of any further assistance, please call Ms. Michele McNulty, of this office, at 785-539-3474 ext. 106.

Sincerely,

Heather Whitlaw
Field Supervisor

cc: KDWPT, Pratt, KS (Ecological Services)
COE, Regulatory Branch, KC, MO
Kansas Biological Survey, (Delisle), Lawrence, KS

AIRPORT DEVELOPMENT GROUP INC.

ADG

December 23, 2014

Michele McNulty
U.S. Fish and Wildlife Service
Kansas Ecological Services Field Office
2609 Anderson Avenue
Manhattan, Kansas 66502

Subject: Lawrence Municipal Airport, Douglas County, Kansas
FAA AIP Project No. 03-20-0047-17-2014
FWS Tracking #2014-CPA-0411

Dear Ms. McNulty:

The City of Lawrence and its Airport Committee have initiated an Environmental Assessment process for the proposed development as previously described in our earlier correspondence dated May 14, 2014. On October 8-9, 2014, an Airport Development Group, Inc. (ADG) biologist conducted an Threatened and Endangered Species assessment in response to your correspondence of June 16, 2014 requesting an assessment for the following federally listed species; Mead's milkweed *(Asclepias meadii)*, western prairie fringed orchid *(Platanthere praeclara)* and the northern long-eared bat *(Myotis septenrionalis)*.

Based upon our review of the listed species for Douglas County Kansas and our knowledge of the airport project site, ADG has made a preliminary determination that suitable habitat does not exist on the airport property or the adjoining properties for the listed species. ADG personnel conducted a detailed walkover of both the airport property as well as adjoining properties and made the following observations:

1. The drainage area to the immediate south of the airport, proposed for development, consists primarily of cool season grasses (K31 fescue) as well as adjacent cultivated agricultural fields, primarily corn and soybeans. This area has been managed for agricultural purposes for approximately the last 15 years with the drainage areas being planted in K31 for the last 5 years. Based on these findings this habitat does not appear to be suitable for the Mead's milkweed *(Asclepias meadii)*, and western prairie fringed orchid *(Platanthere praeclara)*.
2. The area of trees north and west of the airport adjacent to the historic oxbow drainage feature consists primarily of eastern cottonwood *(Populus deltoides)*, American elm *(Ulmus americana)*, Black locust *(Robinia pseudoacacia)*, osage orange *(Maclura pomifera)*, and green ash *(Fraxinus pennsylvanica)*. Of the tree species identified, the peeling and/or exfoliating bark of the eastern cottonwood could provide potential roosting habitat for the northern long-eared bat *(Myotis septenrionalis)* during the active spring and summer seasons. It should be noted that there were no observations noted of this specie during the October 8-9 assessment. Field observations were conducted for this specie during both late afternoon/evening and early morning in an attempt to observe feeding activity.

3. It should be noted that if any tree trimming is required to in order to comply with the FAA safety regulations and advisory circulars the tree trimming will be conducted only between the USFWS stipulated time period of November 1 and February 28.

Please consider this our formal request for concurrence with our findings of no significant impact to the identified species. As we have noted previously, the area of potential bat habitat adjacent to the oxbow drainage feature will not be disturbed during the typical roosting and nesting season, with all trimming activities confined to the time period of November 1-February 28. We are grateful for your assistance with this important issue. Your comments are important for this process and will be appended to the draft and final EA. We respectfully request a response within 45 days of receipt. If you have questions or require further information regarding this request, please contact Steve Marshall at (303) 782-0882.

Sincerely,

Gary Behrens
Environmental Scientist

Photo 1 – Drainage adjacent to agricultural fields with K31 fescue

Photo 2 – Drainage area showing K31 cool season grass and agricultural field

Photo 3 – Area of cottonwood trees and Osage orange above oxbow drainage (note- the stacks of woody material are underbrush and not trimmings from the trees.)

AIRPORT
DEVELOPMENT
GROUP INC.

ADG

May 14, 2014

Mr. John Mitchell
Director
Kansas Department of Health and Environment
1000 Southwest Jackson
Topeka, Kansas 66612-1367

Subject: Lawrence Municipal Airport, City of Lawrence, Kansas
FAA AIP Project No. 03-20-0047-17-2014
Request for Comment; Environmental Assessment

Dear Mr. Mitchell:

The City of Lawrence and the Lawrence Municipal Airport has initiated a National Environmental Policy Act (NEPA) Environmental Assessment (EA) process for the following proposed federal actions:

- Perform drainage study on a portion of the airport (±120 acres)
- Construct T-hangar and access taxiways (±11,650 square yards)
- Prepare (grade and disturb) area for planned landside development (±50 acres)
- Construct perimeter fencing (±29,500 linear feet)
- Rehabilitate general aviation apron (±32,350 square yards)
- Rehabilitate (and strengthen as a consequence) Runway 15-33 (±63,333 square yards)
- Extend Taxiway D to full parallel (±4,950 square yards)
- Construct Phase I (±16,500) and II (±23,400 square yards) GA Aprons

The Lawrence Municipal Airport is listed in the FAA's National Plan of Integrated Airport Systems (NPIAS) as a general aviation airport. The airport site comprises approximately 500 acres of fee simple property ownership, situated within Section 17, Township 12 South, and Range 20 East. The Lawrence Municipal Airport is located approximately 2 miles north of the City of Lawrence. This airport accommodates general aviation and military aircraft.

Enclosed you will find airport layout figures (USGS topo and Aerial) depicting the proposed federal actions. The proposed improvements are shown in color and are tabulated below the drawing view. The proposed federal actions are depicted on the approved Airport Layout Plan, envisioned comply with FAA grant assurances, and to provide for the safety of flight operations and demand accommodation in compliance with FAA guidance.

The drainage study (Improvement No. 1) is a study only with no on-the-ground impacts. T-hangars (Improvement No. 2) are aircraft storage facilities with the necessary access pavements. The lightly-shaded brown cross-hatched area (Improvement No. 3) indicates an area of potential disturbance for future aviation-related tenant occupation. Occupation in this instance perhaps includes fill to level the ground for future large (i.e. 100 feet by 100 feet) hangars/buildings, auto access and parking

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and/or aircraft parking area; the scope and nature of tenant improvements are currently not known. A combination of wildlife fencing and perhaps chain-link nearer to aviation facilities (Improvement No. 4) is envisioned for fencing. Rehabilitation of both the general aviation apron (Improvement No. 5) and Runway 15-33 (Improvement No. 6) are in-place reconstruction of asphalt pavements. Extension of Taxiway D (Improvement No. 7) to full-parallel envisioned is to discourage aircraft back-taxi movements. Finally, new phased-development apron (Improvement No. 8) is envisioned to accommodate potential demand.

It should be noted that the areas within which all proposed federal actions are to occur are currently on existing airport property that has been historically disturbed for farming. The area immediately surrounding the airport is cultivated for crops, primarily soybeans and corn.

We are evaluating environmental issues concerning these proposed federal actions. Please consider this our formal request for you to identify any environmental issues which may be of importance to the proposed federal actions. We respectfully request your comments within thirty (30) days following your receipt of this correspondence. Your comments are important for this process and will be appended to the Draft and Final EA documents. If you have questions or require further information regarding this request, please contact me at (601) 932-6920 or at gbehrens@adgairports.com.

Sincerely,

Gary K. Behrens
Airport Environmental Planner

Enclosures

Division of Environment
Curtis State Office Building
1000 SW Jackson St., Suite 400
Topeka, KS 66612-1367

Kansas
Department of Health & Environment

Phone: 785.296.1535
Fax: 785.296.8464
www.kdheks.gov

Robert Moser, MD, Secretary

Sam Brownback, Governor

Comments by: KDHE

Transmittal Date: June 9, 2014

This form provides notification and the opportunity for your agency to review and comments on this proposed project as required by Executive Order 12372. Review Agency, please complete Parts II and III as appropriate and return to contact person listed below. Your prompt response will be appreciated.

Return To: Gary Behrens, Project Manager
AIRPORT DEVELOPMENT GROUP, INC.
3900 Lakeland Drive, Suite 501 C
Jackson, MS 39232

PART I

REVIEW AGENCIES/COMMISSION

___Aging	___Education	___State Forester
___Agriculture	___Geological Survey, KS	___Transportation
___Biological Survey	_X_Health & Environment	___Water Office, KS
___Conservation Commission	___Historical Society	___Wildlife & Parks
___Corporation Commission	___Social & Rehabilitation	___Commerce

PART II **AGENCY REVIEW COMMENTS**

COMMENTS: (Attach additional sheet if necessary) Re: Lawrence Municipal Airport, City of Lawrence, KS
FAA AIP Project No. 03-20-0047-17-2014
Please see the enclosed comments submitted by Jacqueline Grunau, Bureau of Environmental Remediation and Don Carlson, Bureau of Water.

PART III
RECOMMENDED ACTION COMMENTS:

_X_Clearance of the project should be granted.

__Clearance of the project should not be granted.

___Clearance of the project should be delayed until the issues or questions above have been clarified.

___Request a State Process Recommendation in concurrence with the above comments.

__ Clearance of the project should not be delayed but the Applicant should (in the final application) address and clarify the question or concerns indicated above.

___Request the opportunity to review final application prior to submission to the federal funding agency.

DIVISIONS/ AGENCY/ COMMISSION

John W. Mitchell

John W. Mitchell, Director
Division of Environment

JWM/df

Bureau of Environmental Remediation
Curtis State Office Building
1000 SW Jackson St., Suite 410
Topeka, KS 66612-1367

Robert Moser, MD, Secretary

Kansas
Department of Health and Environment

phone: 785-296-1682
fax: 785-296-4823
jgrunau@kdheks.gov
www.kdheks.gov

Sam Brownback, Governor

MEMORANDUM

TO: Donna Fisher

FROM: Jacqueline Grunau

DATE: May 30, 2014

RE: Intergovernmental Agency Review requested by the Airport Development Group on behalf of the City of Lawrence Municipal Airport for site investigation

---

The Kansas Department of Health and Environment (KDHE), Bureau of Environmental Remediation (BER), Assessment and Restoration Section, Superfund and Drycleaner Remediation Unit has identified one (1) known contaminated drycleaner facility within about three (3) miles of the proposed project.

Site Name	Address	Site ID
Scotch Cleaners	611 Florida St.	C4-023-71948

Staff member(s) from the Airport Development Group are welcome to come and view the KDHE-BER files in accordance with the Kansas Open Records Act. If you have any questions, please contact me by telephone at (785) 296-1682 or by email at jgrunau@kdheks.gov.

Division of Environment
Curtis State Office Building
1000 SW Jackson St., Suite 400
Topeka, KS 66612-1367

Phone: 785.296.1535
Fax: 785.296.8464
www.kdheks.gov

Robert Moser, MD, Secretary

Department of Health & Environment

Sam Brownback, Governor

June 9, 2014

Gary K. Behrens, Project Manager
AIRPORT DEVELOPMENT GROUP, INC.
3900 Lakeland Drive, Suite 501C
Jackson, MS 39232

Re: Lawrence Municipal Airport, City of Lawrence, KS
FAA AIP Project No. 03-20-0047-17-2014

Dear Mr. Behrens:

Please see the following comments submitted by Don Carlson, Bureau of Water.

I have no objection to the proposal but offer the following comments for review and consideration:

Any construction activity which disturbs one acre or more is required to file a National Pollutant Discharge Elimination System (NPDES) permit application for stormwater runoff resulting from construction activities. The project owner (party responsible for the project) must obtain authorization from KDHE to discharge stormwater runoff associated with construction activities prior to commencing construction.
The Kansas construction stormwater general permit, a Notice of Intent (application form), a frequently asked questions file and supplemental materials are on-line on the KDHE Stormwater Program webpage at www.kdhe.state.ks.us/stormwater. Answers to questions regarding or additional information concerning construction stormwater permitting requirements can be obtained by calling 785.296.5549.

Sincerely,

Donna Fisher
Director's Office

DC/df

AIRPORT
DEVELOPMENT
GROUP INC.

ADG

May 14, 2014

Ms. Emma Foltz
Kansas Department of Wildlife and Parks
512 SE 25th Street
Pratt, Kansas 67124

Subject: Lawrence Municipal Airport, City of Lawrence, Kansas
FAA AIP Project No. 03-20-0047-17-2014
Request for Comment; Environmental Assessment

Dear Ms. Foltz:

The City of Lawrence and the Lawrence Municipal Airport has initiated a National Environmental Policy Act (NEPA) Environmental Assessment (EA) process for the following proposed federal actions:

- Perform drainage study on a portion of the airport (±120 acres)
- Construct T-hangar and access taxiways (±11,650 square yards)
- Prepare (grade and disturb) area for planned landside development (±50 acres)
- Construct perimeter fencing (±29,500 linear feet)
- Rehabilitate general aviation apron (±32,350 square yards)
- Rehabilitate (and strengthen as a consequence) Runway 15-33 (±63,333 square yards)
- Extend Taxiway D to full parallel (±4,950 square yards)
- Construct Phase I (±16,500) and II (±23,400 square yards) GA Aprons

The Lawrence Municipal Airport is listed in the FAA's National Plan of Integrated Airport Systems (NPIAS) as a general aviation airport. The airport site comprises approximately 500 acres of fee simple property ownership, situated within Section 17, Township 12 South, and Range 20 East. The Lawrence Municipal Airport is located approximately 2 miles north of the City of Lawrence. This airport accommodates general aviation and military aircraft.

Enclosed you will find airport layout figures (USGS topo and Aerial) depicting the proposed federal actions. The proposed improvements are shown in color and are tabulated below the drawing view. The proposed federal actions are depicted on the approved Airport Layout Plan, envisioned comply with FAA grant assurances, and to provide for the safety of flight operations and demand accommodation in compliance with FAA guidance.

The drainage study (Improvement No. 1) is a study only with no on-the-ground impacts. T-hangars (Improvement No. 2) are aircraft storage facilities with the necessary access pavements. The lightly-shaded brown cross-hatched area (Improvement No. 3) indicates an area of potential disturbance for future aviation-related tenant occupation. Occupation in this instance perhaps includes fill to level the ground for future large (i.e. 100 feet by 100 feet) hangars/buildings, auto access and parking

and/or aircraft parking area; the scope and nature of tenant improvements are currently not known. A combination of wildlife fencing and perhaps chain-link nearer to aviation facilities (Improvement No. 4) is envisioned for fencing. Rehabilitation of both the general aviation apron (Improvement No. 5) and Runway 15-33 (Improvement No. 6) are in-place reconstruction of asphalt pavements. Extension of Taxiway D (Improvement No. 7) to full-parallel envisioned is to discourage aircraft back-taxi movements. Finally, new phased-development apron (Improvement No. 8) is envisioned to accommodate potential demand.

It should be noted that the areas within which all proposed federal actions are to occur are currently on existing airport property that has been historically disturbed for farming. The area immediately surrounding the airport is cultivated for crops, primarily soybeans and corn.

We are evaluating environmental issues concerning these proposed federal actions. Please consider this our formal request for you to identify any environmental issues which may be of importance to the proposed federal actions. We respectfully request your comments within thirty (30) days following your receipt of this correspondence. Your comments are important for this process and will be appended to the Draft and Final EA documents. If you have questions or require further information regarding this request, please contact me at (601) 932-6920 or at gbehrens@adgairports.com.

Sincerely,

for

Gary K. Behrens
Airport Wildlife Biologist

Enclosures

Gary K. Behrens

From: Bartels, Brian [brian.bartels@ksoutdoors.com]
Sent: Wednesday, August 27, 2014 1:58 PM
To: Gary Behrens
Subject: KDWPT Project Review: Lawrence Municipal Airport in Douglas Co.; T12S-R20EW-Sec.17 (FAA AIP #03-20-0047-17-2004; Track 20080368-2)

Mr. Behrens:

The referenced project was reviewed for potential impacts on crucial wildlife habitats, current State-listed Threatened and Endangered species and Species in Need of Conservation (SINC), and Kansas Department of Wildlife, Parks and Tourism managed areas for which this agency has administrative authority.

We provide the following recommendations:

- **Avoid wetland habitat found within the project boundary. We will provide specific recommendations if a permit is issued from the Corps of Engineers (816-389-3990).**
- **Incorporate principles of low impact development (LID), such as permeable asphalt pavement, swales, bioretention, raingardens and on-site phytoremediation. For more information on LID http://www.epa.gov/owow/NPS/lid**
- **Implement and maintain standard erosion-control Best-Management-Practices.**
- **Reseed with native warm-season grass (e.g. Buffalo Grass, *Bouteloua dactyloides*).**

The project will not impact any public recreational areas, nor could we document any potential impacts to currently-listed Threatened or Endangered species. No Department of Wildlife, Parks and Tourism permits or special authorizations will be needed if construction is started within one year, and no design changes are made in the project plans.

Since the Department's recreational land obligations and the State's species listings periodically change, if construction has not started within one year of this date, or if design changes are made in the project plans, the project sponsor must contact this office to verify continued applicability of this assessment report. For our purposes, we consider construction started when advertisements for bids are distributed.

Consider this email our official project review. Contact me with any questions.

Brian Bartels, Ecologist
Ecological Services
Kansas Dept. of Wildlife, Parks and Tourism
512 SE 25th Ave., Pratt, KS 67124
office: 620-672-0746
cell: 620-770-6628
fax: 620-672-2972

AIRPORT
DEVELOPMENT
GROUP INC.

May 14, 2014

Mr. Nick Chevance
U.S. Department of Interior
National Park Service
Midwest Region
601 Riverfront Drive
Omaha, Nebraska 68102-4226

Subject: Lawrence Municipal Airport, City of Lawrence, Kansas
FAA AIP Project No. 03-20-0047-17-2014
Request for Comment; Environmental Assessment

Dear Mr. Chevance:

The City of Lawrence and the Lawrence Municipal Airport has initiated a National Environmental Policy Act (NEPA) Environmental Assessment (EA) process for the following proposed federal actions:

- Perform drainage study on a portion of the airport (±120 acres)
- Construct T-hangar and access taxiways (±11,650 square yards)
- Prepare (grade and disturb) area for planned landside development (±50 acres)
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- Rehabilitate (and strengthen as a consequence) Runway 15-33 (±63,333 square yards)
- Extend Taxiway D to full parallel (±4,950 square yards)
- Construct Phase I (±16,500) and II (±23,400 square yards) GA Aprons

The Lawrence Municipal Airport is listed in the FAA's National Plan of Integrated Airport Systems (NPIAS) as a general aviation airport. The airport site comprises approximately 500 acres of fee simple property ownership, situated within Section 17, Township 12 South, and Range 20 East. The Lawrence Municipal Airport is located approximately 2 miles north of the City of Lawrence. This airport accommodates general aviation and military aircraft.

Enclosed you will find airport layout figures (USGS topo and Aerial) depicting the proposed federal actions. The proposed improvements are shown in color and are tabulated below the drawing view. The proposed federal actions are depicted on the approved Airport Layout Plan, envisioned comply with FAA grant assurances, and to provide for the safety of flight operations and demand accommodation in compliance with FAA guidance.

The drainage study (Improvement No. 1) is a study only with no on-the-ground impacts. T-hangars (Improvement No. 2) are aircraft storage facilities with the necessary access pavements. The lightly-shaded brown cross-hatched area (Improvement No. 3) indicates an area of potential disturbance for future aviation-related tenant occupation. Occupation in this instance perhaps includes fill to level

the ground for future large (i.e. 100 feet by 100 feet) hangars/buildings, auto access and parking and/or aircraft parking area; the scope and nature of tenant improvements are currently not known. A combination of wildlife fencing and perhaps chain-link nearer to aviation facilities (Improvement No. 4) is envisioned for fencing. Rehabilitation of both the general aviation apron (Improvement No. 5) and Runway 15-33 (Improvement No. 6) are in-place reconstruction of asphalt pavements. Extension of Taxiway D (Improvement No. 7) to full-parallel envisioned is to discourage aircraft back-taxi movements. Finally, new phased-development apron (Improvement No. 8) is envisioned to accommodate potential demand.

It should be noted that the areas within which all proposed federal actions are to occur are currently on existing airport property that has been historically disturbed for farming. The area immediately surrounding the airport is cultivated for crops, primarily soybeans and corn.

We are evaluating environmental issues concerning these proposed federal actions. Please consider this our formal request for you to identify any environmental issues which may be of importance to the proposed federal actions. We respectfully request your comments within thirty (30) days following your receipt of this correspondence. Your comments are important for this process and will be appended to the Draft and Final EA documents. If you have questions or require further information regarding this request, please contact me at (601) 932-6920 or at gbehrens@adgairports.com.

Sincerely,

Gary K. Behrens
Airport Environmental Planner

Enclosures

AIRPORT
DEVELOPMENT
GROUP INC.

May 14, 2014

Ms. Coleen Davison
U.S. Department of Agriculture
Natural Resources Conservation Service
Lawrence Service Center
4920 Bob Billings Parkway
Lawrence, Kansas 66049

Subject: Lawrence Municipal Airport, City of Lawrence, Kansas
FAA AIP Project No. 03-20-0047-17-2014
Request for Comment; Environmental Assessment

Dear Ms. Davison:

The City of Lawrence and the Lawrence Municipal Airport has initiated a National Environmental Policy Act (NEPA) Environmental Assessment (EA) process for the following proposed federal actions:

- Perform drainage study on a portion of the airport (±120 acres)
- Construct T-hangar and access taxiways (±11,650 square yards)
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Enclosed you will find airport layout figures (USGS topo and Aerial) depicting the proposed federal actions. The proposed improvements are shown in color and are tabulated below the drawing view. The proposed federal actions are depicted on the approved Airport Layout Plan, envisioned comply with FAA grant assurances, and to provide for the safety of flight operations and demand accommodation in compliance with FAA guidance.

The drainage study (Improvement No. 1) is a study only with no on-the-ground impacts. T-hangars (Improvement No. 2) are aircraft storage facilities with the necessary access pavements. The lightly-shaded brown cross-hatched area (Improvement No. 3) indicates an area of potential disturbance for future aviation-related tenant occupation. Occupation in this instance perhaps includes fill to level

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the ground for future large (i.e. 100 feet by 100 feet) hangars/buildings, auto access and parking and/or aircraft parking area; the scope and nature of tenant improvements are currently not known. A combination of wildlife fencing and perhaps chain-link nearer to aviation facilities (Improvement No. 4) is envisioned for fencing. Rehabilitation of both the general aviation apron (Improvement No. 5) and Runway 15-33 (Improvement No. 6) are in-place reconstruction of asphalt pavements. Extension of Taxiway D (Improvement No. 7) to full-parallel envisioned is to discourage aircraft back-taxi movements. Finally, new phased-development apron (Improvement No. 8) is envisioned to accommodate potential demand.

We have reviewed the U.S. Department of Agriculture (USDA), NRCS Web Soil Survey information for Douglas County, Kansas and have noted four (4) area soil types; the Judson silt loam (flat agricultural land on the first terrace above the oxbow), Eudora-Kimo complex (oxbows), Kimo silty clay loam (somewhat concave land areas), and Kennebec silt loam (higher elevation flat lands). These soil types are representative of the Eudora-Kimo soil association of deep, nearly level to gently undulating, well drained and somewhat poorly drained soils on bottomlands. USDA has defined "prime farmland" as land that is best suited to producing food, feed, forage, fiber and oilseed crops. The Eudora and Judson soils are identified as Capability Class 1-1 and are likely to be considered "prime farmland" soils. Attached is preliminary *Form AD-1006*.

Based on site reconnaissance there is a potential wetland habitat / "other waters of the U.S." identified within the select proposed federal action impact areas. The existence of wetland habitat may be confirmed by a formal wetland delineation, and a request for 'jurisdictional determination' by the U.S. Army Corps of Engineers.

We are evaluating environmental issues concerning these proposed federal actions. Please consider this our formal request for you to identify any environmental issues which may be of importance to the proposed federal actions. We respectfully request your comments within thirty (30) days following your receipt of this correspondence. Your comments are important for this process and will be appended to the Draft and Final EA documents. If you have questions or require further information regarding this request, please contact me at (601) 932-6920 or at gbehrens@adgairports.com.

Sincerely,

FOR Gary K. Behrens
Airport Environmental Specialist

Enclosures

USDA

United States Department of Agriculture

June 11, 2014

Gary K. Behrens
Airport Environmental Specialist
Airport Development Group, Inc.
1776 South Jackson Street
Suite 950
Denver, Colorado 80210-3808

Re: Lawrence Municipal Airport, City of Lawrence, Kansas
FAA AIP Project No. 03-20-0047-2014

Dear Mr. Behrens:

The Farmland Protection Policy Act (FPPA) applies to projects where federal technical or financial assistance is being requested. FPPA provides a process for determining an impact rating when important farmlands are being considered for conversion to non-agricultural uses.

Enclosed is Form AD-1006, Farmland Conversion Impact Rating, with the Natural Resources Conservation Service's (NRCS) parts completed. The originator should complete Parts VI and VII and return a completed copy to this office at the above address.

Sincerely,

Troy Munsch

TROY J. MUNSCH
Assistant State Conservationist (Field Operations)

Enclosure(s)

cc:
James C. Remley, State Soil Scientist, NRCS, Salina, Kansas
Coleen K. Davison, Acting District Conservationist, NRCS, Lawrence, Kansas
Tim Clapp, Acting Supervisory District Conservationist, NRCS, Lyndon, Kansas
Alan R. Boerger, Resource Conservationist, NRCS, Manhattan, Kansas

Natural Resources Conservation Service
3705 Miller Parkway, Suite B
Manhattan, Kansas 66503-7604

Phone: 785-776-7582
FAX: 785-539-7983
www.ks.nrcs.usda.gov

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*		Date Of Land Evaluation Request May 14, 2014	
Name of Project LWC EA		Federal Agency Involved Federal Aviation Administration	
Proposed Land Use Industrial		County and State Douglas, Kansas	
PART II *(To be completed by NRCS)*		Date Request Received By NRCS 6/10/2014	Person Completing Form: Alan Boerger
Does the site contain Prime, Unique, Statewide or Local Important Farmland? *(If no, the FPPA does not apply - do not complete additional parts of this form)*	YES ☑ NO ☐	Acres Irrigated 2,500	Average Farm Size 438 Ac.
Major Crop(s) Corn/Soybeans	Farmable Land In Govt. Jurisdiction Acres: 108,122 % 36%	Amount of Farmland As Defined in FPPA Acres: 127,600 % 42%	
Name of Land Evaluation System Used	Name of State or Local Site Assessment System	Date Land Evaluation Returned by NRCS 6/10/2014	

PART III *(To be completed by Federal Agency)*	Alternative Site Rating			
	Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly	50			
B. Total Acres To Be Converted Indirectly				
C. Total Acres In Site	50			
PART IV *(To be completed by NRCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland	50			
B. Total Acres Statewide Important or Local Important Farmland	0			
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted	<1			
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value	10			
PART V (To be completed by NRCS) Land Evaluation Criterion Relative Value of Farmland To Be Converted (Scale of 0 to 100 Points)	77			

PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(Criteria are explained in 7 CFR 658.5 b. For Corridor project use form NRCS-CPA-106)*	Maximum Points	Site A	Site B	Site C	Site D
1. Area In Non-urban Use	(15)				
2. Perimeter In Non-urban Use	(10)				
3. Percent Of Site Being Farmed	(20)				
4. Protection Provided By State and Local Government	(20)				
5. Distance From Urban Built-up Area	(15)				
6. Distance To Urban Support Services	(15)				
7. Size Of Present Farm Unit Compared To Average	(10)				
8. Creation Of Non-farmable Farmland	(10)				
9. Availability Of Farm Support Services	(5)				
10. On-Farm Investments	(20)				
11. Effects Of Conversion On Farm Support Services	(10)				
12. Compatibility With Existing Agricultural Use	(10)				
TOTAL SITE ASSESSMENT POINTS	160	0	0	0	0
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland *(From Part V)*	100	0	0	0	0
Total Site Assessment *(From Part VI above or local site assessment)*	160	0	0	0	0
TOTAL POINTS *(Total of above 2 lines)*	260	0	0	0	0

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? YES ☐ NO ☐

Reason For Selection:

Name of Federal agency representative completing this form:	Date:

(See Instructions on reverse side)

Form AD-1006 (03-02)

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*		Date Of Land Evaluation Request May 14, 2014	
Name of Project LWC EA		Federal Agency Involved Federal Aviation Administration	
Proposed Land Use Industrial		County and State Douglas, Kansas	
PART II *(To be completed by NRCS)*		Date Request Received By NRCS 6/10/2014	Person Completing Form: Alan Boerger
Does the site contain Prime, Unique, Statewide or Local Important Farmland? *(If no, the FPPA does not apply - do not complete additional parts of this form)*	YES ☑ NO ☐	Acres Irrigated 2,500	Average Farm Size 438 Ac.
Major Crop(s) Corn/Soybeans	Farmable Land In Govt. Jurisdiction Acres: 108,122 36%	Amount of Farmland As Defined in FPPA Acres: 127,603 42%	
Name of Land Evaluation System Used	Name of State or Local Site Assessment System	Date Land Evaluation Returned by NRCS 6/10/2014	

PART III *(To be completed by Federal Agency)*	Alternative Site Rating Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly	50			
B. Total Acres To Be Converted Indirectly				
C. Total Acres In Site	50			
PART IV *(To be completed by NRCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland	50			
B. Total Acres Statewide Important or Local Important Farmland	0			
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted	21			
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value	10			
PART V (To be completed by NRCS) Land Evaluation Criterion Relative Value of Farmland To Be Converted (Scale of 0 to 100 Points)	77			

PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(Criteria are explained in 7 CFR 658.5 b. For Corridor project use form NRCS-CPA-106)*	Maximum Points	Site A	Site B	Site C	Site D
1. Area In Non-urban Use	(15)	13			
2. Perimeter In Non-urban Use	(10)	10			
3. Percent Of Site Being Farmed	(20)	15			
4. Protection Provided By State and Local Government	(20)	20			
5. Distance From Urban Built-up Area	(15)	5			
6. Distance To Urban Support Services	(15)	0			
7. Size Of Present Farm Unit Compared To Average	(10)	0			
8. Creation Of Non-farmable Farmland	(10)	10			
9. Availability Of Farm Support Services	(5)	5			
10. On-Farm Investments	(20)	2			
11. Effects Of Conversion On Farm Support Services	(10)	0			
12. Compatibility With Existing Agricultural Use	(10)	2			
TOTAL SITE ASSESSMENT POINTS	160	82	0	0	0
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland *(From Part V)*	100	77	0	0	0
Total Site Assessment *(From Part VI above or local site assessment)*	160	82	0	0	0
TOTAL POINTS *(Total of above 2 lines)*	260	159	0	0	0

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? YES ☐ NO ☐

Reason For Selection:

Name of Federal agency representative completing this form: | Date:

(See Instructions on reverse side)

ALAN BOERGER

Digitally signed by ALAN BOERGER
DN: c=US, o=U.S. Government, ou=Department of Agriculture, cn=ALAN BOERGER, 0.9.2342.19200300.100.1.1=12001000134448
Date: 2015.03.19 08:17:04 -05'00'

Form AD-1006 (03-02)

AIRPORT
DEVELOPMENT
GROUP INC.

ADG

May 14, 2014

U.S. Army Corps of Engineers
Northwestern Division
Kansas City Regulatory Office
601 E. 12th Street
Kansas City, Missouri 64106

Subject: Lawrence Municipal Airport, City of Lawrence, Kansas
FAA AIP Project No. 03-20-0047-17-2014
Request for Comment; Environmental Assessment

Dear USACE Representative:

The City of Lawrence and the Lawrence Municipal Airport has initiated a National Environmental Policy Act (NEPA) Environmental Assessment (EA) process for the following proposed federal actions:

- Perform drainage study on a portion of the airport (±120 acres)
- Construct T-hangar and access taxiways (±11,650 square yards)
- Prepare (grade and disturb) area for planned landside development (±50 acres)
- Construct perimeter fencing (±29,500 linear feet)
- Rehabilitate general aviation apron (±32,350 square yards)
- Rehabilitate (and strengthen as a consequence) Runway 15-33 (±63,333 square yards)
- Extend Taxiway D to full parallel (±4,950 square yards)
- Construct Phase I (±16,500) and II (±23,400 square yards) GA Aprons

The Lawrence Municipal Airport is listed in the FAA's National Plan of Integrated Airport Systems (NPIAS) as a general aviation airport. The airport site comprises approximately 500 acres of fee simple property ownership, situated within Section 17, Township 12 South, and Range 20 East. The Lawrence Municipal Airport is located approximately 2 miles north of the City of Lawrence. This airport accommodates general aviation and military aircraft.

Enclosed you will find airport layout figures (USGS topo and Aerial) depicting the proposed federal actions. The proposed improvements are shown in color and are tabulated below the drawing view. The proposed federal actions are depicted on the approved Airport Layout Plan, envisioned comply with FAA grant assurances, and to provide for the safety of flight operations and demand accommodation in compliance with FAA guidance.

The drainage study (Improvement No. 1) is a study only with no on-the-ground impacts. T-hangars (Improvement No. 2) are aircraft storage facilities with the necessary access pavements. The lightly-shaded brown cross-hatched area (Improvement No. 3) indicates an area of potential disturbance for future aviation-related tenant occupation. Occupation in this instance perhaps includes fill to level the ground for future large (i.e. 100 feet by 100 feet) hangars/buildings, auto access and parking

and/or aircraft parking area; the scope and nature of tenant improvements are currently not known. A combination of wildlife fencing and perhaps chain-link nearer to aviation facilities (Improvement No. 4) is envisioned for fencing. Rehabilitation of both the general aviation apron (Improvement No. 5) and Runway 15-33 (Improvement No. 6) are in-place reconstruction of asphalt pavements. Extension of Taxiway D (Improvement No. 7) to full-parallel envisioned is to discourage aircraft back-taxi movements. Finally, new phased-development apron (Improvement No. 8) is envisioned to accommodate potential demand.

Based on site reconnaissance there is a potential wetland habitat / "other waters of the U.S." identified within the select proposed federal action impact areas. The existence of wetland habitat may be confirmed by a formal wetland delineation, and a request for 'jurisdictional determination' by the U.S. Army Corps of Engineers.

We are evaluating environmental issues concerning these proposed federal actions. Please consider this our formal request for you to identify any environmental issues which may be of importance to the proposed federal actions. We respectfully request your comments within thirty (30) days following your receipt of this correspondence. Your comments are important for this process and will be appended to the Draft and Final EA documents. If you have questions or require further information regarding this request, please contact me at (601) 932-6920 or at gbehrens@adgairports.com.

Sincerely,

FOR Gary K. Behrens
Airport Environmental Specialist

Enclosures

DEPARTMENT OF THE ARMY
KANSAS CITY DISTRICT, CORPS OF ENGINEERS
635 FEDERAL BUILDING
601 E 12TH STREET
KANSAS CITY MO 64106-2824

REPLY TO
ATTENTION OF

June 17, 2014

Regulatory Branch
(NWK-2014-673)

Mr. Gary Behrens
Airport Development Group, Inc.
3900 Lakewood Drive, Suite 501 C
Jackson, Mississippi 39232

Dear Mr. Behrens:

This is in reply to your letter dated May 19, 2014, requesting comments and authorization requirements for improvements at the Lawrence Municipal Airport. The airport is located in Section 17, Township 12 South, Range 20 East, Douglas, Lawrence, Kansas.

The Corps of Engineers has jurisdiction over all waters of the United States. Discharges of dredged or fill material in waters of the United States, including wetlands, require prior authorization from the Corps under Section 404 of the Clean Water Act (Title 33 United States Code Section1344). The implementing regulation for this Act is found at Title 33 Code of Federal Regulations Parts 320-332.

Should the proposed improvements require the discharge of dredged or fill material in any waters of the United States, including wetlands, a Department of the Army (DA) permit may be required. However, if the proposed improvements do not require the discharge of dredged or fill material in any waters of the United States, including wetlands, a DA permit will not be required.

Federal regulations require that a DA permit be issued by the Corps of Engineers prior to the initiation of any construction on the portion of a proposed activity which is within the Corps' regulatory jurisdiction.

Enclosed is a copy of our brochure entitled "Activities Requiring Permits."

We are interested in your thoughts and opinions concerning your experience with the Kansas City District, Corps of Engineers Regulatory Program. Please feel free to complete our Customer Service Survey form on our website at: http://corpsmapu.usace.army.mil/cm_apex/f?p=regulatory_survey. You may also call and request a paper copy of the survey which you may complete and return to us by mail or fax.

If you have any questions concerning this matter, please feel free to contact Mr. Matthew Sailor at (816) 389-3739. Please reference Regulatory File No. NWK-2014-673 in all comments and/or inquiries relating to this project.

Enclosure

Activities Requiring Permits

Contractors	Builders	Planners
Excavators	Engineers	Homeowners
Consultants	Landowners	Farmers

The Corps of Engineers is charged with the responsibility for protecting the public interest in waters of the United States. This is accomplished through a Department of the Army permit program. Under this program, most activities involving work in waters of the United States, including wetlands, require authorization from the Corps of Engineers. Individuals, companies, corporations, Federal and State agencies, and local governments planning construction activities in a stream, river, lake or wetland should contact the Kansas City District, U.S. Army Corps of Engineers, **BEFORE ANY WORK IS BEGUN**.

Why?

Because your proposed work may be subject to one or both of the following Federal Acts:

Section 10 of the Rivers and Harbors Act of 1899 regulates any work or structure in, over, or under navigable waters of the United States. This includes such items as boat docks, boat ramps, powerlines, excavation, filling, etc.

Section 404 of the Clean Water Act regulates the discharge of dredged or fill material in all waters of the United States, including rivers, streams, lakes and wetlands. This includes work such as site development fills, causeways or road fills, dams and dikes, artificial islands, bank stabilization (riprap, seawalls and breakwaters) levees, landfills, fish attractors, mechanized clearing of wetlands, and certain types of excavation activities, etc.

Be Sure Before you Start Construction

Department of the Army permits must be obtained prior to starting any work within the Corps' jurisdiction. Persons planning any construction activities in or near any water body should should write or call:

Corps of Engineers, Kansas City District
Regulatory Branch
601 East 12th Street, Room 402
Kansas City, MO 64106
Telephone: 816-389-3990
FAX: 816-389-2032
http://www.nwk.usace.army.mil/Missions/RegulatoryBranch.aspx

A map of the Kansas City District, Regulatory Program Service Areas can be found at:
http://www.nwk.usace.army.mil/Portals/29/docs/regulatory/webregmap-sep2006.pdf

US Army Corps of Engineers
Kansas City District

AIRPORT
DEVELOPMENT
GROUP INC.

ADG

August 13, 2014

Ms. Kim Gant
State Historic Preservation Office
Historic Preservation; Review and Compliance Coordinator
Kansas Historical Society
6425 SW 6th Avenue
Topeka, Kansas 66615-1099

Subject: Lawrence Municipal Airport, City of Lawrence, Kansas
FAA AIP Project No. 03-20-0047-17-2014
Request for Comment; Environmental Assessment

Dear Ms. Gant:

The City of Lawrence and the Lawrence Municipal Airport has initiated a National Environmental Policy Act (NEPA) Environmental Assessment (EA) process for the following proposed federal actions:

- Perform drainage study on a portion of the airport (±120 acres)
- Construct T-hangar and access taxiways (±11,650 square yards)
- Prepare (grade and disturb) area for planned landside development (±50 acres)
- Construct perimeter fencing (±29,500 linear feet)
- Rehabilitate general aviation apron (±32,350 square yards)
- Rehabilitate (and strengthen as a consequence) Runway 15-33 (±63,333 square yards)
- Extend Taxiway D to full parallel (±4,950 square yards)
- Construct Phase I (±16,500) and II (±23,400 square yards) GA Aprons

The Lawrence Municipal Airport is listed in the FAA's National Plan of Integrated Airport Systems (NPIAS) as a general aviation airport. The airport site comprises approximately 500 acres of fee simple property ownership, situated within Section 17, Township 12 South, and Range 20 East. The Lawrence Municipal Airport is located approximately 2 miles north of the City of Lawrence. This airport accommodates general aviation and military aircraft.

Enclosed you will find airport layout figures (USGS topo and Aerial) depicting the proposed federal actions. The proposed improvements are shown in color and are tabulated below the drawing view. The proposed federal actions are depicted on the approved Airport Layout Plan, envisioned comply with FAA grant assurances, and to provide for the safety of flight operations and demand accommodation in compliance with FAA guidance.

The drainage study (Improvement No. 1) is a study only with no on-the-ground impacts. T-hangars (Improvement No. 2) are aircraft storage facilities with the necessary access pavements. The lightly-shaded brown cross-hatched area (Improvement No. 3) indicates an area of potential disturbance for future aviation-related tenant occupation. Occupation in this instance perhaps includes fill to level

the ground for future large (i.e. 100 feet by 100 feet) hangars/buildings, auto access and parking and/or aircraft parking area; the scope and nature of tenant improvements are currently not known. A combination of wildlife fencing and perhaps chain-link nearer to aviation facilities (Improvement No. 4) is envisioned for fencing. Rehabilitation of both the general aviation apron (Improvement No. 5) and Runway 15-33 (Improvement No. 6) are in-place reconstruction of asphalt pavements. Extension of Taxiway D (Improvement No. 7) to full-parallel envisioned is to discourage aircraft back-taxi movements. Finally, new phased-development apron (Improvement No. 8) is envisioned to accommodate potential demand.

Based upon early potential subcontractor coordination two recorded sites were noted 14DO1014 and 14DO1020 within the select proposed federal action impact areas. The existence of any resources may be confirmed by a formal investigation should FAA as lead agency see fit.

We are evaluating environmental issues concerning these proposed federal actions. Please consider this our formal request for you to identify any environmental issues which may be of importance to the proposed federal actions. We respectfully request your comments within thirty (30) days following your receipt of this correspondence. Your comments are important for this process and will be appended to the Draft and Final EA documents. If you have questions or require further information regarding this request, please contact me at (601) 932-6920 or at gbehrens@adgairports.com.

Sincerely,

Gary K. Behrens
Airport Environmental Specialist

Enclosures

6425 SW 6th Avenue
Topeka, KS 66615

phone: 785-272-8681
fax: 785-272-8682
email@kshs.org

Kansas Historical Society

Sam Brownback, Governor
Jennie Chinn, Executive Director

KSR&C No. 14-08-144

August 20, 2014

Gary K. Behrens
Airport Environmental Specialist
Airport Development Group Inc.
3900 Lakeland Drive, Suite 501C
Jackson, MS 39232

Via E-Mail

RE: Lawrence Municipal Airport Improvements
FAA AIP Project No. 03-20-0047-17-2014
Douglas County

Dear Mr. Behrens:

In accordance with 36 CFR 800, the Kansas State Historic Preservation Office has reviewed your letter dated August 13, 2014, describing plans for the above-referenced project. Prior to beginning construction, a professional archeologist should survey portions of the project area as they are situated in a locality of high and/or moderate archeological potential. Our concern is that (as you noted) recorded archeological sites are situated within the proposed project as well as nearby along the Kansas River and its tributaries in similar topographic settings. Specifically, survey should be conducted in the proposed development areas (including the drainage study locality) south of the airport along with the proposed Taxiway D extension.

Any archeologist meeting the Minimum Professional Qualifications of this office as outlined in *The State Historic Preservation Officer's Guide For Archeological Survey, Assessment, and Reports* (SHPO's Guide), is eligible to perform the requested work. A list of archeological contractors meeting these standards is available from our web site at: http://www.kshs.org/p/archeological-consultants/14593.

We note that your firm is preparing an environmental assessment in compliance with the National Environmental Policy Act (NEPA). While we are always willing to respond, our office has no role in the NEPA process. We are contacted as part of consultation mandated in Section 106 of the National Historic Preservation Act. The Section 106 regulations require that a project's lead federal agency, presumably the Federal Aviation Administration (FAA) in this case, notify not only our office but also any Indian tribes that may have interest in the area. A list of tribes, arranged by county, may be found on our agency's web site at: http://www.kshs.org/p/tribes-with-potential-consultation-interests-in-kansas/14611.

This information is provided at your request to assist you in identifying historic properties, as specified in 36 CFR 800 for Section 106 consultation procedures. If you have questions or need additional information regarding these comments, please contact Tim Weston at 785-272-8681 (ext. 214) or Kim Gant at 785-272-8681 ext. 225. Please refer to the Kansas Review & Compliance number (KSR&C#) above on all future correspondence relating to this project.

Sincerely,

Jennie Chinn
Executive Director and
State Historic Preservation Officer

Timothy Weston for

Patrick Zollner
Deputy State Historic Preservation Officer

U.S. Department
Of Transportation

Federal Aviation
Administration

Central Region
Iowa, Kansas
Missouri, Nebraska

901 Locust
Kansas City, Missouri 64106-2325

August 11, 2014

CERTIFIED MAIL

Dr. Bruce Obermeyer
NAGPRA Representative
Delaware Tribe of Oklahoma
1417 West Street
Emporia, KS 66801

Re: Environmental Assessment (EA) – Early Coordination
Lawrence Municipal Airport; Lawrence, Kansas

Dear Dr. Obermeyer:

An EA is being prepared for proposed development at the Lawrence Municipal Airport, located approximately two miles northeast of Lawrence, Kansas. We are offering the opportunity to provide input on the project. To assist in the analysis, we are enclosing two maps.

The development includes the following major projects which are all shown on the maps:

- Perform drainage study on a portion of the airport (±120 acres)
- Construct T-hangar and access taxiways (±11,650 square yards)
- Prepare (grade and disturb) area for planned landside development (±50 acres)
- Construct perimeter fencing (±29,500 linear feet)
- Rehabilitate general aviation apron (±32,350 square yards)
- Rehabilitate (and strengthen as a consequence) Runway 15-33 (±63,333 square yards)
- Extend Taxiway D to full parallel (±4,950 square yards)
- Construct Phase I (±16,500) and II (±23,400 square yards) GA Aprons

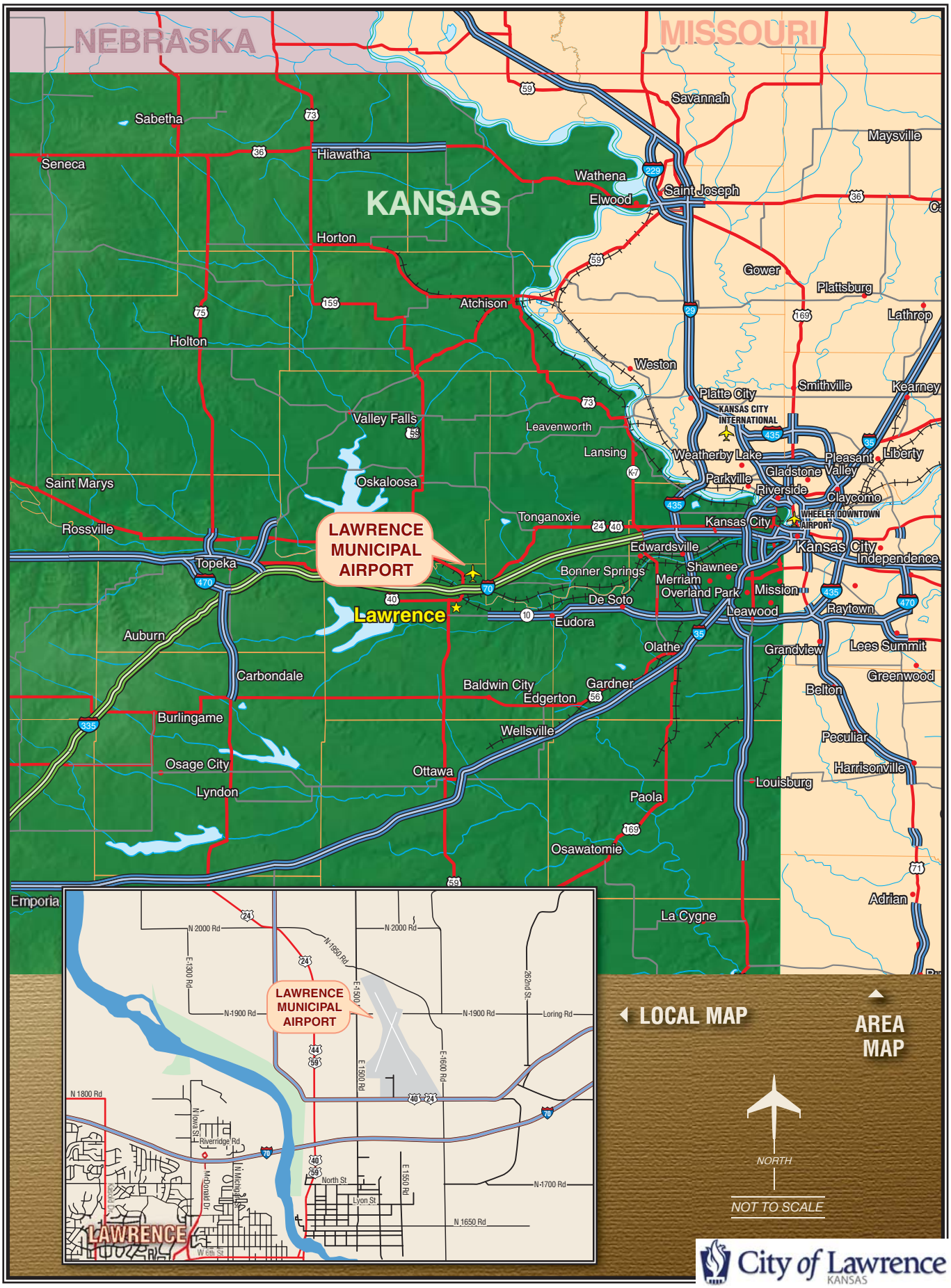
To help in preparation of the EA, we would appreciate your input (via mail or e-mail) within thirty (30) days. The FAA is the lead federal agency for the NEPA document. Jim Johnson, FAA Central Region Airports Division Manager, will be making the final FAA decision on the EA. If you have questions or require additional information, please contact me at 816-329-2639 or scott.tener@faa.gov .

Sincerely,

Scott Tener, P.E.
Environmental Specialist

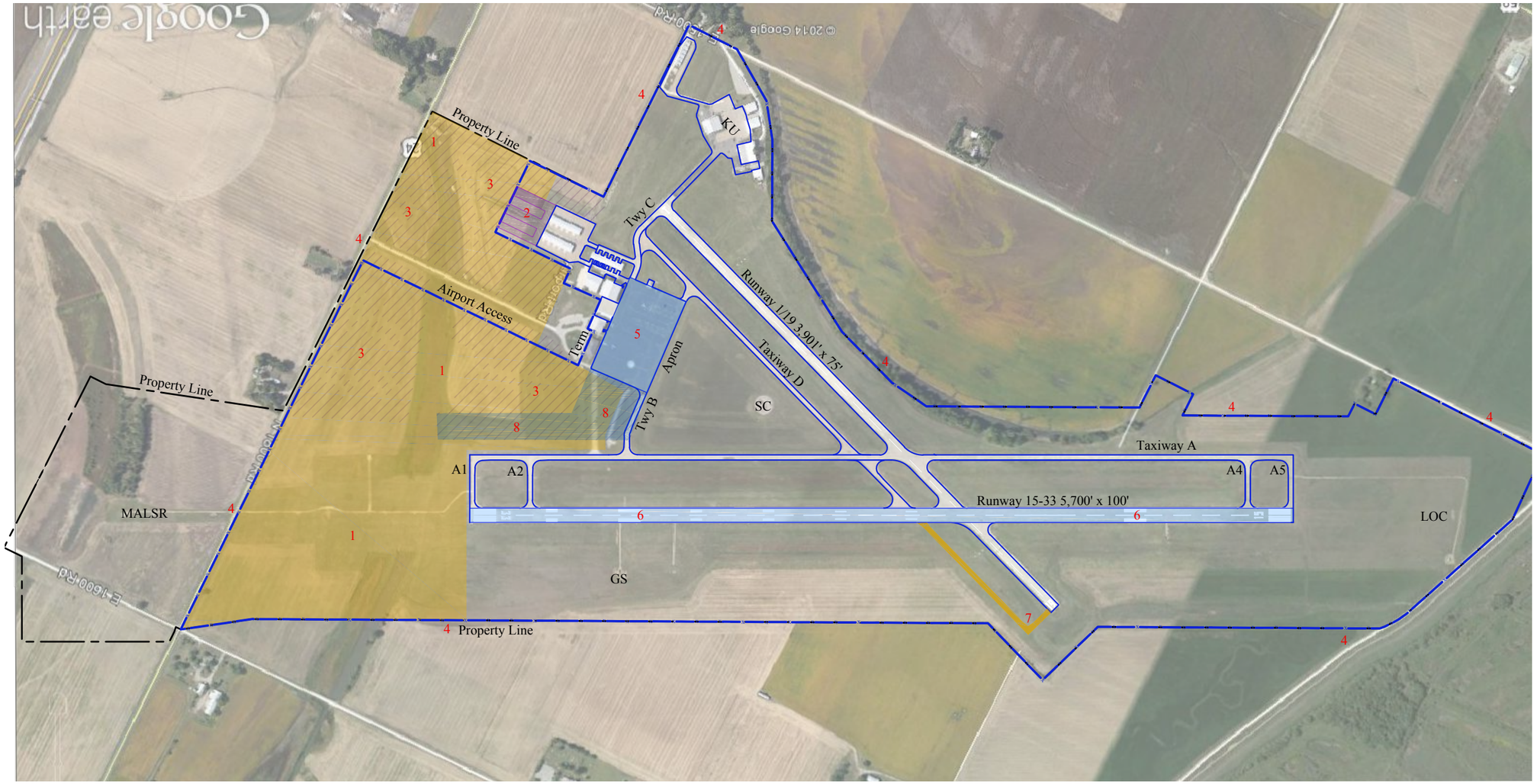
Enclosures

10MP07-1A-8/27/10



City of Lawrence KANSAS

Exhibit 1A
LOCATION MAP



Planned Improvements	
Number	Project
1	Perform Drainage Study on a Portion of the Airport (±120 Ac)
2	Construct T-Hangars and Access Taxiways (±11,650 sqyds)
3	Prepare (Grade and Disturb) Area for Planned Development (±50 Ac)
4	Construct Perimeter Fence (±29,500 lf)
5	Rehabilitate General Aviation Apron (±32,350 sqyds)
6	Rehabilitate (and Strengthen) Runway 15-33 (±63,333 sqyds)
7	Extend Taxiway D to Full-Parallel (±4,950 sqyds)
8	Construct Phase I (±16,500 sqyds) and II (±23,400 sqyds) GA Aprons

True

Graphic Scale

400 0 200 400 800 1600 Feet

120 0 60 120 240 480 Meters

No. Revision Ckd Date

Lawrence Municipal Airport

Lawrence, Kansas

ADG AIRPORT DEVELOPMENT GROUP INC.
1776 South Jackson Street | Suite 950
Denver, Colorado 80210-3822
303.758.9801 | 303.758.9804 fax
www.ADGAirports.com

AIP Project No. 03-20-0047-17-2014 (EA)

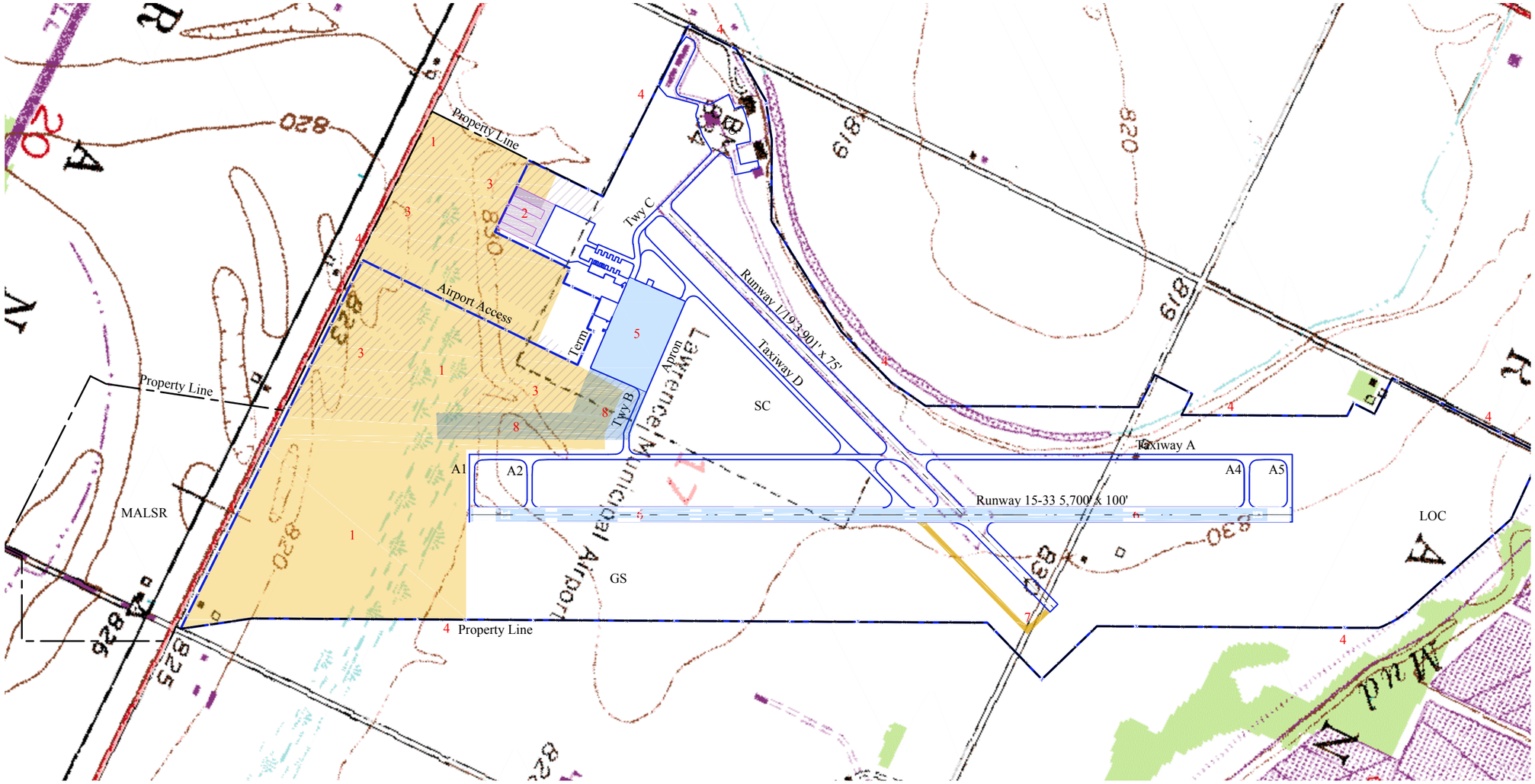
Project No.:	LWC	Designed By:	JES
Drawn By:	SPM	Approved By:	DPH
Date:	March 2014		

Environmental Assesssment
Projects; Purpose/Need
Aerial Backgroud

Exhibit:

I

of II Exhibits



Planned Improvements

Number	Project
1	Perform Drainage Study on a Portion of the Airport (±120 Ac)
2	Construct T-Hangars and Access Taxiways (±11,650 sqyds)
3	Prepare (Grade and Disturb) Area for Planned Development (±50 Ac)
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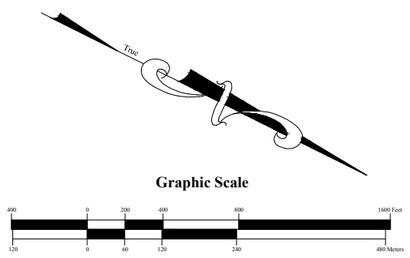


No. Revision Ckd Date

Lawrence Municipal Airport
Lawrence, Kansas

ADG AIRPORT DEVELOPMENT GROUP INC.
1776 South Jackson Street | Suite 950
Denver, Colorado 80210-3822
303.758.8801 | 303.758.8804 fax
www.ADGAirports.com

AIP Project No. 03-20-0047-17-2014 (EA)

Project No.:	LWC		
Designed By:	JES		
Drawn By:	SPM		
Approved By:	DPH		
Date:	March 2014		

Environmental Assessment Projects; Purpose/Need USGS 7.5' Quad. Backgroud

Exhibit:

II

of II Exhibits

Delaware Tribe Historic Preservation Office
1200 Commercial St.
Roosevelt Hall, RM 212
Emporia State University
Emporia, KS 66801
(620) 341-6699
bobermeyer@delawaretribe.org

October 28, 2014

U.S. Department of Transportation
Federal Aviation Administration
Attn: Scott Tener
901 Locust
Kansas City, Missouri 64106

Re: Environmental Assessment Lawrence Municipal Airport; Lawrence, Kansas

Dear Scott Tener,

Thank you for informing the Delaware Tribe on the proposed construction associated with the above referenced project. **Our review indicates that the project is located in the vicinity of significant archaeological or historic resources that hold cultural and religious significance to the Delaware Tribe.** Given the location of the proposed project, we request that you conduct a Phase I archaeological survey that includes background research, surface survey and subsurface testing of the project area.

We wish to continue as a consulting party on this project and look forward to receiving a copy of the Phase I survey report so we may reevaluate the project and its' potential threat to culturally significant resources. If human remains are discovered during the survey, we request that you immediately halt all ground disturbing activities and contact the Delaware Tribe before moving forward with the survey or project construction. We respectfully request that all construction for the proposed project is not initiated until after we are able to review the Phase I survey report and provide our written comments.

If you have any questions, feel free to contact this office by phone at (620) 341-6699 or by e-mail at bobermeyer@delawaretribe.org.

Sincerely,

Brice Obermeyer

Brice Obermeyer
Delaware Tribe Historic Preservation Office
1200 Commercial St
Roosevelt Hall, RM 212
Emporia State University
Emporia, KS 66801

TRIBAL HISTORIC PRESERVATION OFFICE

Date: **October 7, 2014** **File: 1314-1744KS-8**

RE: **FAA Development of Lawrence Municipal Airport - Environmental Assessment - Early Coordination**

Federal Aviation Administration
Scott Tener
901 Locust
Kansas City, MO 64106

Dear Mr. Tener ,

The Osage Nation Historic Preservation Office has received notification and accompanying information for the proposed project listed as FAA Development of Lawrence Municipal Airport - Environmental Assessment - Early Coordination. **The Osage Nation requests a copy of the Draft Programmatic Environmental Impact Statement.**

In accordance with the National Historic Preservation Act, (NHPA) [16 U.S.C. 470 §§ 470-470w-6] 1966, undertakings subject to the review process are referred to in S101 (d)(6)(A), which clarifies that historic properties may have religious and cultural significance to Indian tribes. Additionally, Section 106 of NHPA requires Federal agencies to consider the effects of their actions on historic properties (36 CFR Part 800) as does the National Environmental Policy Act (43 U.S.C. 4321 and 4331-35 and 40 CFR 1501.7(a) of 1969).

The Osage Nation has a vital interest in protecting its historic and ancestral cultural resources. **The Osage Nation anticipates reviewing and commenting on the Draft Programmatic Environmental Impact Statement for the proposed FAA Development of Lawrence Municipal Airport - Environmental Assessment - Early Coordination.**

Should you have any questions or need any additional information please feel free to contact me at the number listed below. Thank you for consulting with the Osage Nation on this matter.

Zuzana Chovanec, Ph.D.
Archaeologist

627 Grandview, Pawhuska, OK 74056, (918) 287-5328, Fax (918) 287-5376

Planned Improvements

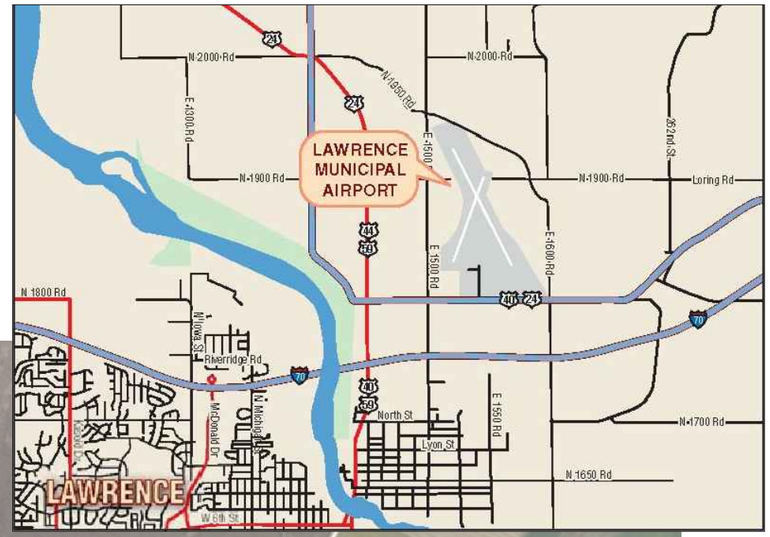
Number	Project
1	Perform Drainage Study on a Portion of the Airport (±67 Ac)
2	Construct T-Hangars and Access Taxiways (±11,650 sqyds)
3	Prepare (Grade and Disturb) Area for Planned Development (±50 Ac)
4	Construct Perimeter Fence (±29,500 lf)
5	Rehabilitate General Aviation Apron (±32,350 sqyds)
6	Rehabilitate (and Strengthen) Runway 15-33 (±63,333 sqyds)
7	Extend Taxiway D to Full-Parallel (±4,950 sqyds)
8	Construct Phase I (±16,500 sqyds) and II (±23,400 sqyds) GA Aprons

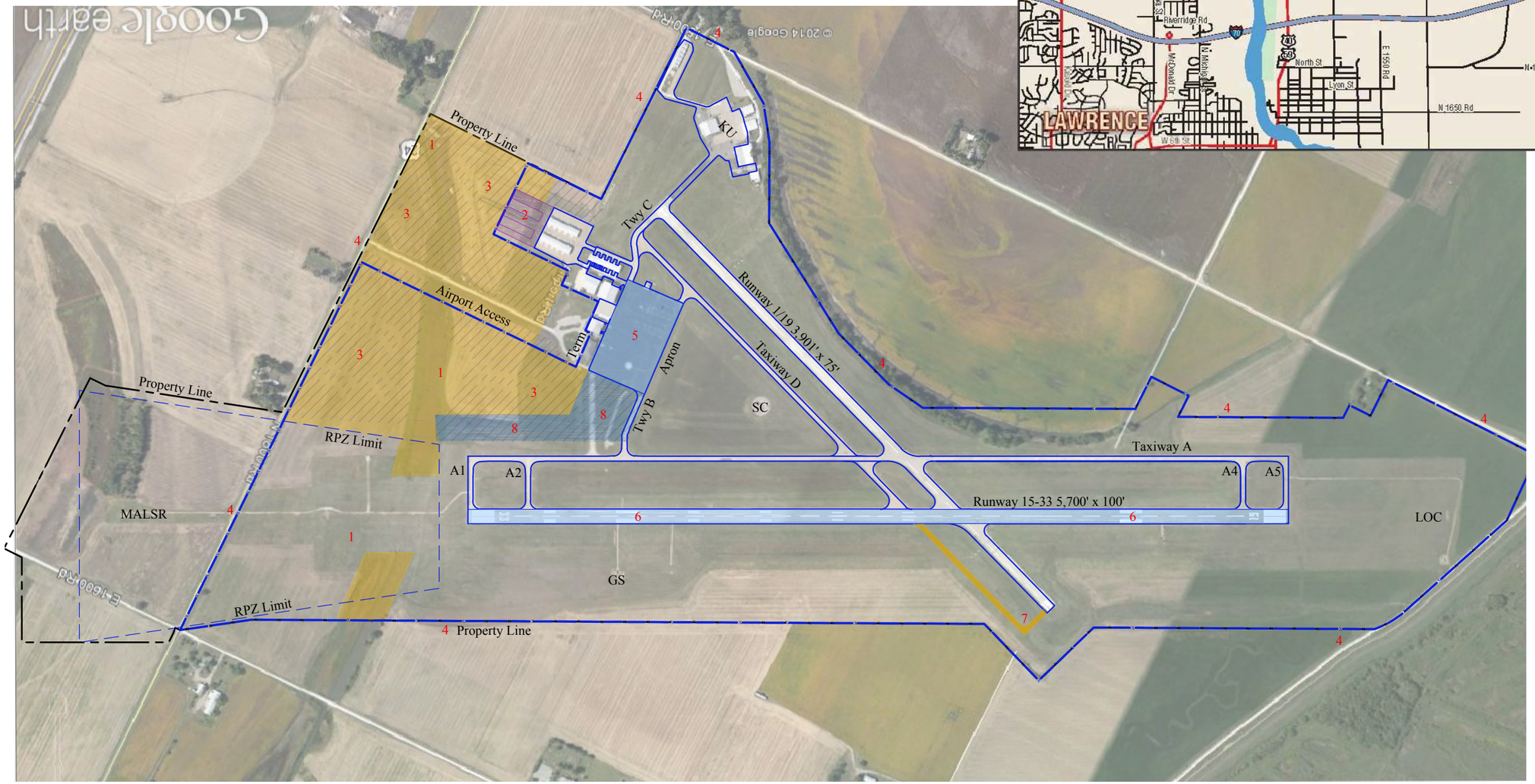
True

Graphic Scale

400 0 200 400 800 1600 Feet

120 0 60 120 240 480 Meters





Lawrence Municipal Airport
Lawrence, Kansas

No.	Revision	Ckd	Date

ADG AIRPORT DEVELOPMENT GROUP INC.
1776 South Jackson Street / Suite 950
Denver, Colorado 80210-2852
303.782.0840 / 303.782.0844 fax
www.ADGAirports.com

AIP Project No. 03-20-0047-17-2014 (EA)

Project No.:	LWC
Designed By:	JES
Drawn By:	SPM
Approved By:	DPH
Date:	March 2014

Environmental Assesssment
Projects; Purpose/Need
Aerial Backgroud

Exhibit:

I

of II Exhibits

AIRPORT
DEVELOPMENT
GROUP INC.

ADG

September 26, 2014

Ms. Kim Gant
State Historic Preservation Office
Historic Preservation; Review and Compliance Coordinator
Kansas Historical Society
6425 SW 6th Avenue
Topeka, Kansas 66615-1099

Subject: Lawrence Municipal Airport, City of Lawrence, Douglas County, Kansas
FAA AIP Project No. 03-20-0047-17-2014
Follow-up Request for Comment; Environmental Assessment

VIA EMAIL: tweston@kshs.org

Dear Ms. Gant:

This letter follows on from ADG's August 13 letter, and SHPO's August 20 response on the subject. SHPO's August 20 letter recommended investigation not limited to the 'drainage study locality'. ADG gathers this to mean the entire area depicted on the attachments in previous correspondence as Purpose and Need (P&N) Items No. 1, approximating ±120 acres.

Since receipt of SHPO's August 20 letter, preliminary investigation has be completed into the nature and extent of drainage improvements for EA purposes. Three study options have been developed, as attached, which serve to substantiate an extent of disturbance for drainage improvements, regardless of option. The City will be considering the options; and, I find that the limits of P&N Item No. 1 have decreased in size. ADG has updated our P&N drawing, as attached, to reflect the current situation, namely ±42 as opposed to ±120 acres.

If you wish to provide additional or other comments pursuant to this modification, please contact me at (303) 782-0882 or at smarshall@adgairports.com. Either Gary or I are happy to discuss any aspect of this with you.

Sincerely,

Steve Marshall
Planning Project Manager

Enclosures (**Email**)

1776 South Jackson Street • Suite 950
Denver, Colorado 80210-3808

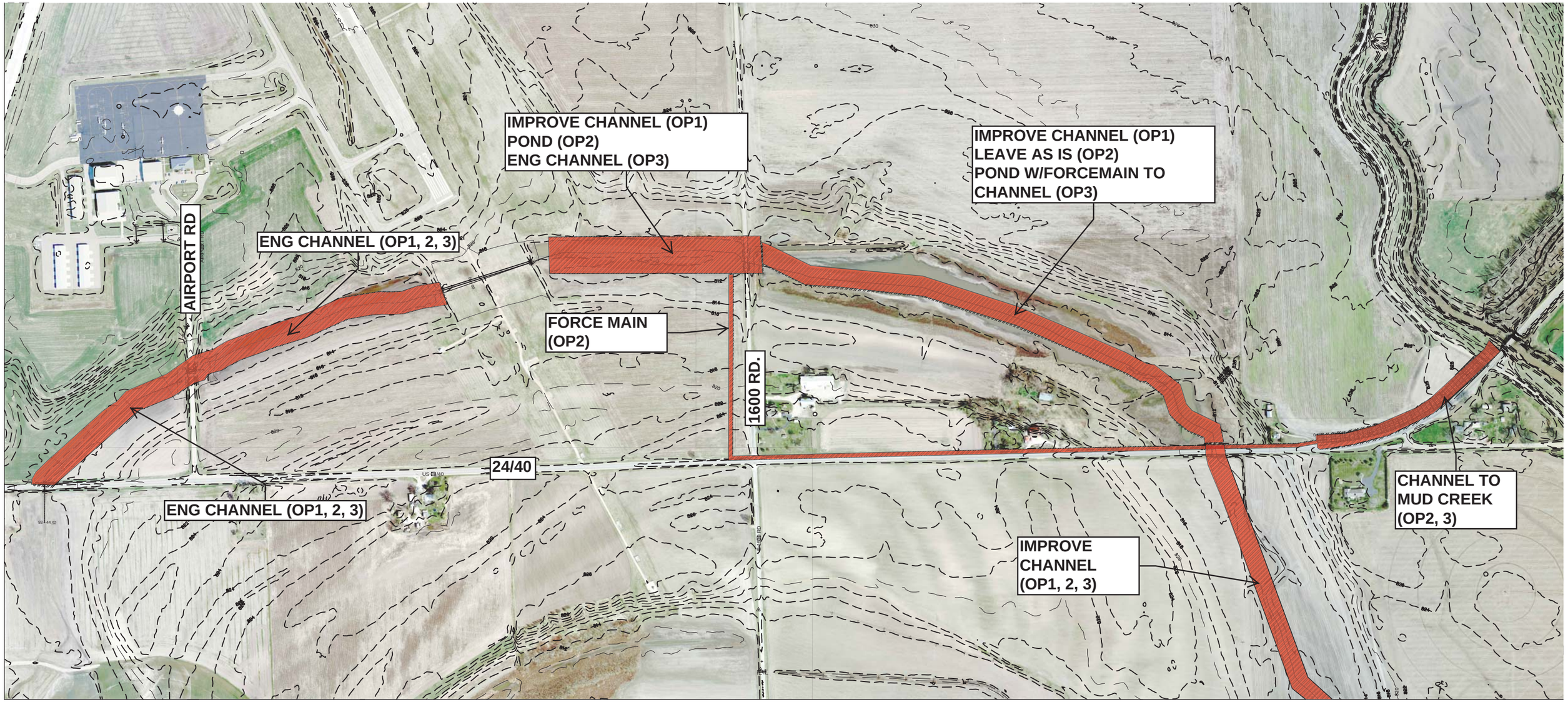
303.782.0882 • 303.782.0842 fax
www.ADGAirports.com

Denver, CO • Jackson, MS • Lawrence, KS • Salt Lake City, UT

OPTION 1
AREA = 22 AC

OPTION 2
AREA = 20 AC

OPTION 3
AREA = 24 AC



Memo to Project File

Date: 12/2/2014

Project: Lawrence Municipal Airport

Lawrence, KS

To: Project File LWC1451M, NEPA Correspondence

KS SHPO, Tim Weston (785) 272-8681 x214

Based on a telephone conversation with Tim Weston, Kansas SHPO, on October 22, 2014 concerning the relocation of the wildlife fence along the oxbow drainage embankment on the NW area of the airport property; ADG indicated that they had contracted with Ms. Janice McLean, RPA, to conduct a cultural resource assessment of the proposed areas of development including the fenceline relocation. ADG asked Mr. Weston if the SHPO needed to review the area of the new fenceline placement and he indicated that since we had Ms. McLean conducting the survey, she would know the areas to be concerned with along the oxbow drainage for potential cultural/historical concerns. The SHPO did not need to review any additional planning documents at this time and would review Ms. McLean's report of findings for final comment

Gary K. Behrens, ADG

Gary K. Behrens

From: John Mitchell [jmitchell@kdheks.gov]
Sent: Wednesday, December 10, 2014 11:35 AM
To: 'Gary K. Behrens'
Subject: RE: Lawrence Municipal Airport, Update

Mr. Behrens,

This is in response to your email request of December 2, 2014, regarding the update on the Lawrence Municipal Airport project.

Following review of the information you provided we concur that the modifications to the original project plan are minor and that the modification does not require re-submittal of the proposed project drawings for review.

Best wishes as this project proceeds.

John Mitchell
Director, Division of Environment
Kansas Department of Health and Environment
1000 SW Jackson, Suite 400
Topeka, KS 66612-1367

785-296-1535

My email address is:

jmitchell@kdheks.gov

Kansas
Department of Health and Environment

From: Gary K. Behrens [mailto:gbehrens@adgairports.com]
Sent: Tuesday, December 02, 2014 10:44 AM
To: John Mitchell
Subject: Lawrence Municipal Airport, Update

Mr. Mitchell,

As directed by my Airport Planning Manager in our Denver HQ, I wanted to make you aware of a slight modification to the original project, FAA AIP Project No. 03-20-0047-17-2014, that you have granted clearance for on your June 9, 2014 transmittal. The proposed project modification is a slight relocation of the proposed wildlife fenceline along the embankment adjacent to the oxbow drainage located along the NW boundary of the airport. This project modification has been reviewed with the US Army Corps of Engineers, US Fish & Wildlife Service, and the Kansas SHPO with their agreement that this modification will not require a re-submittal of the proposed project drawings for review based on this minor modification. Please issue a concurrence e-mail for our project files. Thank you for your assistance.

Memo to Project File

Date: 12/2/2014

Project: Lawrence Municipal Airport

Lawrence, KS

To: Project File LWC1451M, NEPA Correspondence

USACE, Matt Sailor (816) 389-3739

Based on a telephone conversation with Matthew Sailor, USACE Kansas City District, on October 22, 2014 concerning the relocation of the wildlife fence along the oxbow drainage embankment on the NW area of the airport property; Mr. Sailor indicated that ADG did not need to submit additional proposed planning drawings at this time. He indicated that once the final project design is complete, ADG should submit the USACE Individual Permit (IP) Application for the proposed project impacts, i.e., taxiway extension, apron expansion, hangar development, and fenceline impacts.

Gary K. Behrens, ADG

Memo to Project File

Date: 12/2/2014

Project: Lawrence Municipal Airport

Lawrence, KS

To: Project File LWC1451M, NEPA Correspondence

US FWS, Michele McNulty (785) 539-3474 x106

Based on a telephone conversation with Michele McNulty, USFWS, on December 2, 2014 concerning the relocation of the wildlife fence along the oxbow drainage embankment on the NW area of the airport property; she indicated USFWS did not need to review any additional planning documents at this time. ADG also discussed the potential bat habitat along the oxbow drainage and indicated that any trimming of the trees would occur during the non active time period of November 1 to February 1 of the year. ADG also discussed the lack of suitable habitat present in the form of cool season grasses and cultivated farm fields, for the two identified botanical species, i.e., Mead's milkweed and the Western prairie fringed orchid. I indicated that an assessment report would be forwarded to USFWS under separate cover requesting concurrence with no impact to TES by December 19, 2014.

Gary K. Behrens, ADG

Appendix C: Public Involvement

People Consulted:
Steve Bennett, City of Lawrence

Public Notifications:

Appendix D: Sponsor Land Use Letter

City of Lawrence
PUBLIC WORKS

DAVID L. CORLISS
CITY MANAGER

City Offices
PO Box 708 66044-0708
www.lawrenceks.org

6 East 6th St
785-832-3000
FAX 785-832-3405

March 13, 2015

Scott Tener, P.E.
Environmental Specialist
FAA Central Region Airports Division
901 Locust St., Room 364
Kansas City, MO 64106-2325

Subject: **Lawrence Municipal Airport (ADT)**
Environmental Assessment, AIP Project No. 03-20-0005-010-2013
Statement of Compatible Land Use Assurance

Dear Mr. Tener:

The City of Lawrence, Kansas makes the following statement of compatible land use assurance as required by Section 511(a)(5) of the Airport and Airway Improvement Act of 1982, as amended.

The City of Lawrence, Kansas provides assurance that appropriate action, including the adoption of zoning laws, has been or will be taken, to the extent reasonable, to restrict the use of land adjacent to or in the immediate vicinity of LWC to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft. This action includes the consideration of both existing and planned land uses. In addition, we will encourage and support jurisdictions in the area in their efforts to do the same.

If you have any questions regarding this matter, please call us.

Sincerely,

Charles F. Soules, P.E.
Public Works Director

Appendix E: Section 106 Consultation

-Investigation Performed by RCGoodwin
-SHPO Response from Investigation
-FAA Impact Category Findings

MARCH 2015

INTENSIVE PHASE II ARCHEOLOGICAL SURVEY AND GEOARCHEOLOGICAL INVESTIGATIONS OF PROPOSED IMPROVEMENTS AT THE LAWRENCE MUNICIPAL AIRPORT, CITY OF LAWRENCE, DOUGLAS COUNTY, KANSAS

CONTAINS PRIVILEGED INFORMATION – DO NOT RELEASE

Prepared For:

AIRPORT DEVELOPMENT GROUP, INC.
1776 SOUTH JACKSON ST., SUITE 950
DENVER, COLORADO 80210-3808

R. CHRISTOPHER GOODWIN & ASSOCIATES, INC.
850 EAST 13TH STREET, SUITE C ▪ LAWRENCE, KS 66044

INTENSIVE PHASE II ARCHEOLOGICAL SURVEY AND GEOARCHEOLOGICAL INVESTIGATIONS OF PROPOSED IMPROVEMENTS AT THE LAWRENCE MUNICIPAL AIRPORT, CITY OF LAWRENCE, DOUGLAS COUNTY, KANSAS

Federal Aviation Administration (FAA) AIP Project No. 03-20-0047-17-2014

KSR&C No. 14-08-144

Principal Investigator

Janice A. McLean, M.A.

By

Janice A. McLean, M.A., Laura R. Murphy, M.A., Shannon R. Ryan, M.A., Dawn M. Munger, M.A., Garrett A. Welch, M.A., Paul A. Demers, Ph.D., Patrick M. Green, and Alan R. Potter, M.A.

R. CHRISTOPHER GOODWIN & ASSOCIATES, INC.
850 E. 13th St., Suite C
Lawrence, Kansas 66044

March 2015

For

AIRPORT DEVELOPMENT GROUP, INC.
1776 South Jackson St., Suite 950
Denver, Colorado 80210-3808

ABSTRACT

This study was commissioned by Airport Development Group, Inc. (ADG) of Denver, Colorado on behalf of ADG's client, the City of Lawrence, Kansas. The City of Lawrence owns and operates the Lawrence Municipal Airport (LWC), located three miles north of Downtown Lawrence in rural Douglas County, Kansas. The purpose of the study is to address the Kansas State Historic Preservation Officer's recommendation for an archeological survey of high and/or moderate potential areas that may be affected by eight proposed improvements at LWC.

The list of proposed improvements is based on the Airport Master Plan, developed in 2012, and drainage improvements requested by the City of Lawrence, Kansas Department of Public Works. Item 1 is a pre-design drainage study. Items 2, 3, and 8 will involve new construction, with grading and/or construction-related ground disturbances to a maximum anticipated depth of impact of 61-91 cm (24-36 in) below ground surface (bgs). Item 4 is a perimeter fence. Items 5 and 6 involve rehabilitation of existing airfield pavements. Item 7, a proposed extension of Taxiway D, involves either asphalt or concrete construction with a proposed depth of impact of ~46 cm (18 in) bgs in an area of multiple buried utilities and prior grading. Of the eight planned improvements, Items 1, 2, 3, 4, and 8 were selected for archeological investigation, and Items 5, 6, and 7 were excluded.

The list of proposed improvements is under funding consideration over a multi-year Capital Improvement Plan through the Federal Aviation Administration (FAA). Contingent upon availability of federal funds and upon acceptance of a National Environmental Policy Act (NEPA) Environmental Assessment (EA), the City of Lawrence, as airport sponsor, may be eligible to receive FAA grants over the next five years to fund the list of proposed improvements.

From 19-23 January 2015, on behalf of ADG, R. Christopher Goodwin & Associates, Inc. (RCG&A) surveyed 75.65 acres of high and moderate archeological sensitivity at LWC across four survey areas (Areas A-D). No archeological evidence was encountered in Areas B or C, and no further archeological work is recommended for those areas, both of which are associated with the proposed perimeter fence (Item 4). Previously recorded archeological sites 14DO1014 and 14DO1020 are plotted in or adjacent to LWC in Areas D and A, respectively.

Site 14DO1014, a previously recorded historic archeological site, was relocated in Area D and subjected to intensive shovel testing, surface artifact recordation, and archival research to assess its significance under National Register criteria B and D (36 CFR 60.4). Site 14DO1014 will be impacted by the excavation of postholes (24-36 inches in depth) for the installation of support posts for the proposed perimeter fence (Item 4). Based on the results of the current archeological investigation and archival research, 14DO1014 is recommended not eligible for the National Register of Historic Places (36 CFR 60.4[a-d]). Site 14DO1014 is not a historic property, and no further work is recommended.

In Area A, RCG&A encountered no artifacts within the upper 60 cm (24 in) of Soil 1 that would justify extending the boundary of adjacent prehistoric archeological Site 14DO1020 eastward onto LWC property. In Area A, Items 2, 3, and 8 will have no effect on historic properties, and no further work is recommended for these items. For Area A in general, RCG&A recommends no further archeological research for undertakings that occur at a depth range of 0-165 cm (0-65 in) bgs.

For the drainage study (Item 1), the archeological investigations generated design recommendations for any drainage improvements that involve deep earth-moving activities. The auger test results from Area A suggest that the archeological evidence at 14DO1020 is not associated with the surface soil (Soil 1), but rather derives from the on-going cultivation and incision of a deeply buried soil (Soil 2) detected in three auger tests (1, 7, and 8) excavated on LWC property. In the high sensitivity zone of Area A to the west of Airport Road, the top of Soil 2 was detected in three auger tests at about 205-218 cm (81-85 in) bgs. Drainage improvements that exceed approximately 165 cm (65 in) bgs have the potential to intersect the buried soil and any associated archeological content. In the high sensitivity zone of Area A to the west of Airport Road, RCG&A recommends additional deep testing of the Area(s) of Potential Effect(s) of any future undertaking(s) that require(s) subsurface excavation to depths in excess of 165 cm (65 in) bgs.

In Area A to the east of Airport Road, RCG&A excavated two auger tests (5-6) that yielded evidence of a different soil-stratigraphic profile dominated by a massive sandy deposit with low potential for buried cultural material. RCG&A advises LWC/ADG to locate any future undertakings that involve deep subsurface excavation to the east of Airport Road because no further deep testing is recommended for that area of LWC property.

ACKNOWLEDGEMENTS

R. Christopher Goodwin & Associates, Inc. appreciates the project coordination and information provided by Mr. Steve Marshall and Mr. Rick Bryant of Airport Development Group, Inc., and Mr. Dale Mooney and Mr. Steven Bennett of the City of Lawrence Public Works. We thank Mr. Monte Soukup of the KU Endowment Association for granting RCG&A survey permission to revisit Site 14DO1014. We extend our thanks to the entire staff of the Lawrence Municipal Airport for their kind tolerance during our week of disruption. We also appreciate expedited research assistance rendered by Dr. Robert Hoard and Mr. Patrick Barry of the Kansas Historical Society.

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TABLE OF CONTENTS

FIGURES, TABLES, AND ACRONYMS

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List of Acronyms

ADG	Airport Development Group, Inc.
APE	Area of Potential Effects
bgs	below ground surface
cm	centimeters
CFR	Code of Federal Regulations
DCCR	Douglas County Courthouse Records
EA	Environmental Assessment
FAA	Federal Aviation Administration
FDGC	Federal Geographic Data Committee
ft	feet
GLO	Two historic roads/trails mapped in the KSHS Archeological Inventory
GPS	Global Positioning System
gsv	ground surface visibility
Hwy	Highway
in	inches
KHRI	Kansas Historic Resources Inventory
KSHS	Kansas Historical Society
KU	University of Kansas
KUEA	KU Endowment Association
LIDAR	Light Detection And Ranging
LWC	Lawrence Municipal Airport
m	meters
mya	million years ago
NAD83	North American Datum of 1983
NAIP	National Agricultural Imagery Program
NEPA	National Environmental Policy Act
NED	National Elevation Dataset
NHAP	National High Altitude Photography
NHPA	National Historic Preservation Act
NRCS	Natural Resources Conservation Service
RCG&A	R. Christopher Goodwin & Associates, Inc.
SBAS	Satellite-Based Augmentation System
SHPO	State Historic Preservation Office
SSURGO	Soil Survey Geographic database
sq	square
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
ya	years ago
yds	yards

Chapter 1
INTRODUCTION

Lawrence Municipal Airport (LWC) is a general aviation airport registered in the Federal Aviation Administration's National Plan of Integrated Airport Systems. LWC comprises approximately 500 acres of fee simple property ownership, situated in Section 17, Township 12 South, Range 20 East, approximately three miles north of Downtown Lawrence, Kansas on East US Hwy 24/40 in rural Douglas County (Figure 1.1). Since October 1929, LWC has been owned and operated by the City of Lawrence, Kansas (2000-2015a).

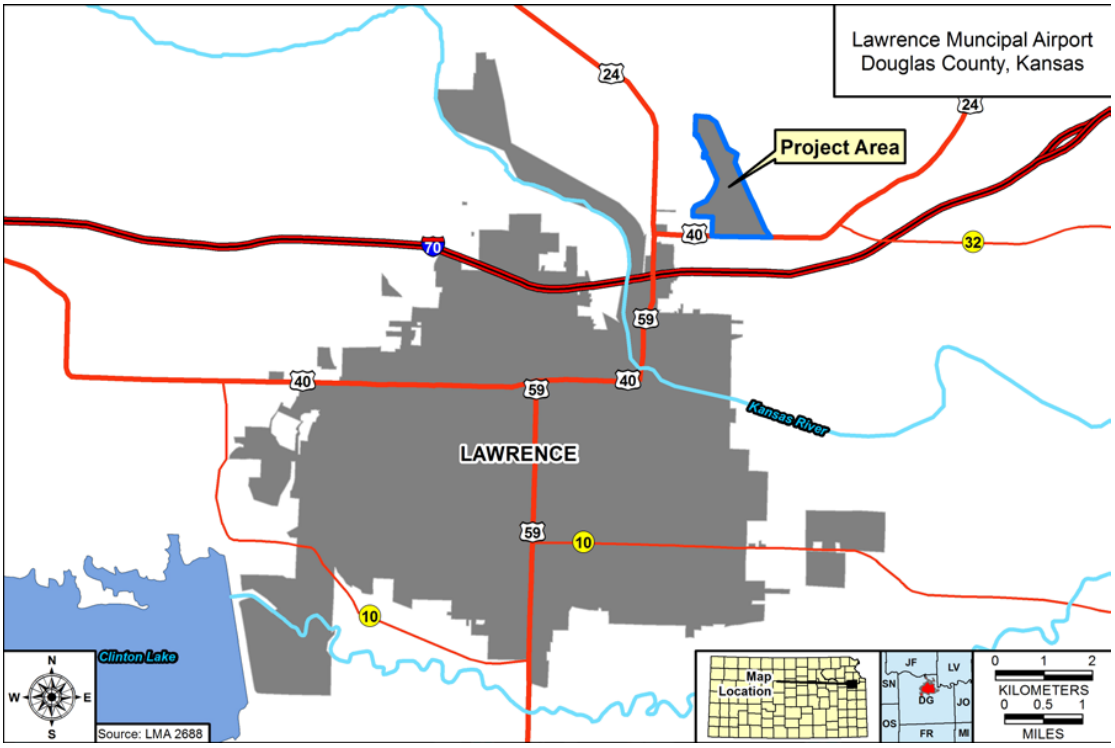

Figure 1.1. Location of the Lawrence Municipal Airport Project Area relative to the City of Lawrence, Douglas County, Kansas.

As the Airport's Sponsor, the City of Lawrence has initiated a National Environmental Policy Act (NEPA) Environmental Assessment (EA) for the following proposed improvements (Items 1-8):

1) Perform a drainage study on a Portion of LWC (±67 ac)
2) Construct T-Hangars and Access Taxiways (±11,650 sq yds / ~2.4 ac)
3) Prepare (grade and disturb) Area for Planned Development (±50 ac)
4) Construct a Perimeter Fence (±27,400 linear ft / 8,351.5 m)
5) Rehabilitate General Aviation Apron (±32,350 sq yds)
6) Rehabilitate (and Strengthen) Runway 15-33 (±63,333 sq yds)
7) Extend Taxiway D to Full-Parallel (±4,950 sq yds / ~1.0 ac)
8) Construct Phase I (±16,500 sq yds) and II (±23,400 sq yds) General Aviation Aprons.

Figure 1.2 depicts the locations of these proposed project items at LWC. Item 1 is a no-impact planning study to aid in the design of drainage improvements for the southern portion of LWC. Items 2, 3, and 8 will involve new construction, with grading and/or construction-related ground disturbances to a maximum anticipated depth of impact of 61-91 cm (24-36 in) below ground surface (bgs). Item 4 is a perimeter fence. A portion of the perimeter fence will be installed along the densely wooded margin of a relict oxbow of the Kansas River. The exact placement of the fence along the terrace escarpment is uncertain, but the activities will require tree removal, grading, and, possibly, fence post installation at depths in excess of 91 cm (36 in) beneath the terrace tread. Items 5 and 6 involve in-place reconstruction of existing asphalt runway infrastructure. The anticipated depth of impact for Item 7, the extension of Taxiway D, is not expected to exceed 46 cm (18 in) bgs in an area of prior grading disturbance and utility emplacement. Of the eight planned improvements, Items 1, 2, 3, 4, and 8 were selected for archeological investigation, and Items 5, 6, and 7 were excluded.

If authorized, the proposed improvements may be funded by grants from the Federal Aviation Administration (FAA) to the City of Lawrence on behalf of LWC. The proposed improvements constitute a Federal "undertaking" pursuant to Section 106 of the National Historic Preservation Act (NHPA), as amended, and compliance with 36 CFR 800, "Protection of Historic Properties."

In a project review letter dated 20 August 2014 (Appendix A), the Kansas State Historic Preservation Officer (SHPO) recommended that ADG arrange for pre-construction survey of portions of the Project area due to its setting in an area of high to moderate archeological potential. Specifically, the SHPO recommended survey of those items located south of the airport, including the drainage study area (Item 1) and the proposed extension of Taxiway D (Item 7).

On behalf of their client, the City of Lawrence, Airport Development Group, Inc. (ADG) selected R. Christopher Goodwin & Associates, Inc. (RCG&A) to provide archeological services in support of the EA and compliance with 36 CFR 800. As discussed in detail in Chapter 5, Figure 1.3 depicts the 75.65 acres of high and moderate sensitivity selected by RCG&A for Phase II archeological survey. Contrary to the SHPO recommendation (Appendix A), RCG&A excluded Item 7 (Figure 1.2) from the Phase II archeological survey because multiple buried utilities intersect the Area of Potential Effects (APE), and evidence of prior ground disturbances associated with runway/taxiway construction and drainage improvements is well documented by recent topographic and aerial imagery.

RCG&A performed the work for the LWC Improvement Projects (Projects) in accordance with the Secretary of Interior's Standards and Guidelines (United States Department of the Interior, National Park Service 1983); with 36 CFR Part 61, which specifies appropriate personnel qualifications in the disciplines of archeology, history, and architectural history; and, with the *Kansas SHPO's Guide to Archeological Survey, Assessment, and Reports* (Epperson, Banks, and Stein 2010).

Janice A. McLean, M.A., served as Principal Investigator for RCG&A. Assistant Project Managers Dawn M. Munger, M.A., Garrett A. Welch, M.A., and David T. Williams, M.A., co-directed the fieldwork conducted 19-23 January 2015. Laura R. Murphy, M.A., served as Project Geoarcheologist. Crew members included Robert W. Conard, Michael H. Davis, Patrick M. Green, M.A., and Erin E. McLaughlin, M.A. Archival research was directed by Shannon Ryan, M.A. Historic artifacts were analyzed by Ms. Munger, with assistance from Paul A. Demers, Ph.D. GIS services and report graphics were provided by Alan R. Potter, M.A. Diane Thomas produced this report for the Lawrence, Kansas office of RCG&A.

This report is organized as follows. Chapter 2 establishes the environmental setting of LWC. Chapter 3 identifies key historic contexts relevant to the interpretation of archeological sites at LWC and its environs. Chapter 4 summarizes the Phase I pre-field background research conducted prior to the Phase II archeological investigations. Chapter 5 presents the research design, provides the results of the sensitivity model developed using research presented in Chapters 2-4, and describes the survey methods. Chapter 6 documents the results of the Phase II investigations. Chapter 7 summarizes the results and recommendations of the study. Appendix A contains project correspondence between ADG and the Kansas SHPO, Appendix B contains descriptions of ten auger test profiles,

and Appendix C presents the site form revision submitted for 14DO1014. Although geoarcheological research of relevance to 14DO1020 is discussed in this report, a site form revision was not prepared because RCG&A did not complete any fieldwork within the registered site boundary, which does not extend onto LWC property. RCG&A recommends adding a bibliography link for this report to the Kansas Historical Society Archeological Inventory record for 14DO1020.

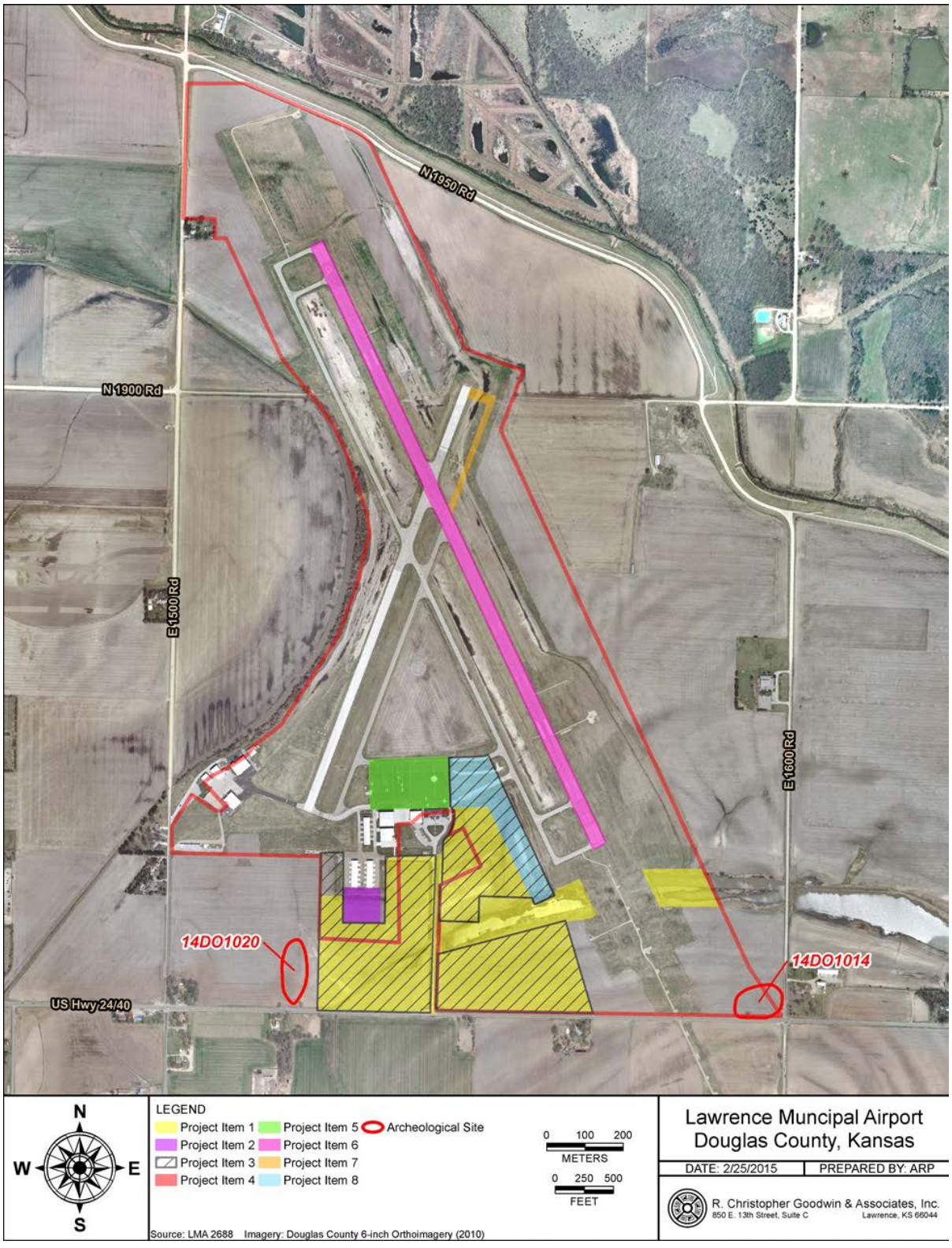

Figure 1.2. Locations of Items 1-8 at the Lawrence Municipal Airport.

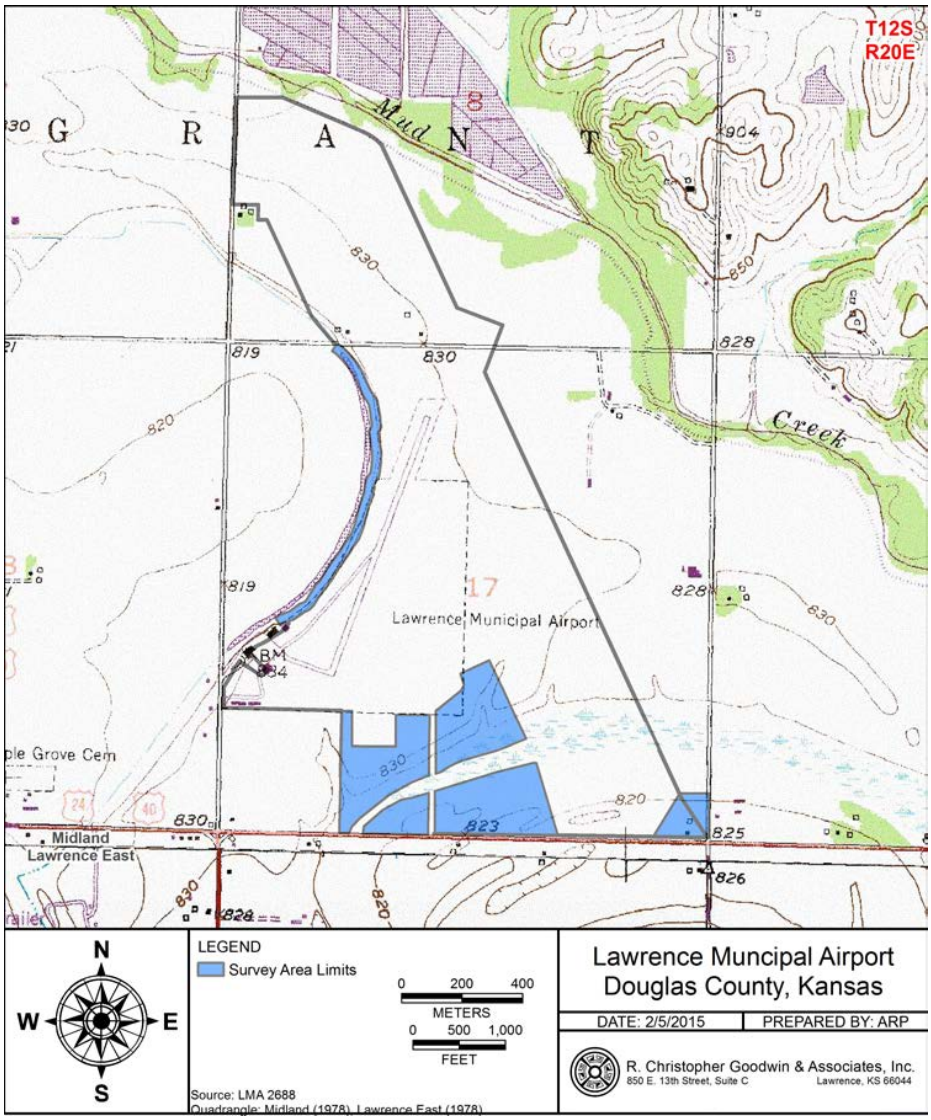

Figure 1.3. United States Geological Survey (USGS) 7.5-Minute quadrangle map excerpts (USGS 1978a, 1978b) of RCG&A survey areas totaling 75.65 acres at the Lawrence Municipal Airport.

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Chapter 2
ENVIRONMENTAL SETTING

Physiography and Geology

The Project area lies directly south of Mud Creek, a tributary of the Kansas River in Douglas County Kansas (O'Conner 1992; Figure 2.1). The Kansas River originates at the confluence of the Republican and Smoky Hill rivers near Junction City, Kansas, and flows eastward through the Flint Hills, Glaciated Region, and Osage Cuestas physiographic sub-provinces of the Central Lowlands physiographic province (Fenneman 1931) before entering the Missouri River. In Douglas County, the Kansas River marks the northern boundary of the Osage Cuestas, with the Glaciated Region north of the river (Mandel 2006). The Glaciated Region is characterized by deposits of glacial till that thicken progressively northward, and a series of river terraces, notably the local Newman terrace (Shortridge and Shortridge 2001). In Douglas County, the width of the Kansas and Wakarusa river valleys suggest they originated as ice margin streams that carried significant glacial meltwater (McCauley 1998; Shortridge and Shortridge 2001:8). Long, low rolling hills and wide, shallow valleys define the Osage Cuestas, which formed through the differential erosion of Pennsylvanian-aged shale and limestone bedrock (Mandel 2006:12).

The detailed surface geology depicted in Figure 2.1 was digitized from the revised *Geologic Map of Douglas County, Kansas* (O'Connor 1992). The bedrock geology of eastern Kansas contains alternating layers of limestone and shale with occasional layers of sandstone (Shortridge and Shortridge 200:6). The Pennsylvanian bedrock geology of Douglas County formed when the whole region was covered by a shallow sea of fluctuating depth. Originally the bedrock was horizontal; however, subsequent tectonic events in southern Missouri pushed igneous materials toward the surface causing the overlying rock to form a dome shape (Shortridge and Shortridge 2001:6). Remnants of this dome shape are visible at the surface in the form of north-northeast to south-southwest escarpments or cuestas that have steep eastern slopes formed by differential erosion of rock layers and gentle west facing slopes. The Oread Limestone dominates the surface geology of the Lawrence area. The most dramatic example is Mount Oread, which is underlain by the Oread Limestone, upon which the University of Kansas (KU) is built (Shortridge and Shortridge 2001:7).

Quaternary landscape evolution has bearing on the location and preservation of archeological deposits. The spatial and temporal patterns of Kansas River valley aggradation, erosion, and soil formation characterize landscape evolution in the Project area (Beeton and Mandel 2011). The Pleistocene and Holocene epochs compose the Quaternary Period, which dates from about 2.588 mya to present. Fluvial terraces, or former floodplain surfaces, often contain buried soils, or former stable land surfaces once occupied by people. Where preserved, buried soils have high potential to contain in situ archeological deposits. In other words, there is high potential for buried archaeology in the buried soils of terrace fills not eroded by extensive lateral channel migration of the Kansas River.

Four late Pleistocene-Holocene terraces define the landscape development in the Kansas River valley. From oldest to youngest, the terrace sequence includes the Menoken, Buck Creek, Newman, and the Holliday terrace complexes (Sorenson et al. 1987). The Menoken terrace is the highest on the landscape. Early to middle Pleistocene in age, the Menoken terrace lies 25-30 meters above the modern floodplain, and consists of glacial rather than alluvial sediments (Sorenson et al. 1987; Johnson 1987:63). The Buck Creek terrace formed during the mid to late Pleistocene, and is 11-12 meters above the modern floodplain. It consists of fining-upward sequences of alluvial gravel, sand, silt, and clay that are mantled by loess. Most of the Buck Creek terrace has been removed by lateral migration of the Kansas River, but remnants occur at the mouths of tributary streams (Sorenson et al. 1987:94, Johnson 1987:34). The fill underlying the Menoken and Buck Creek terraces was deposited prior to the human occupation of the area.

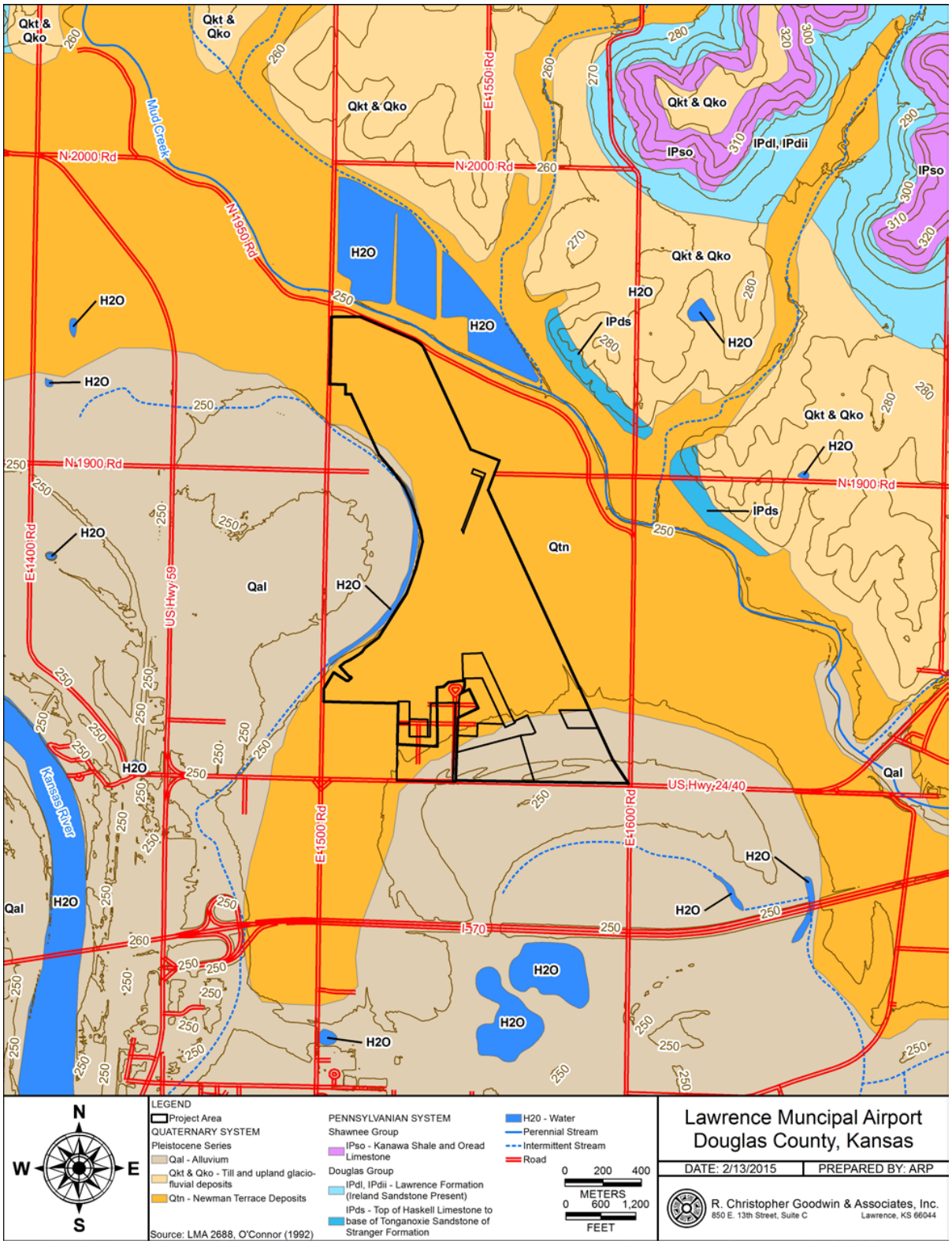

Figure 2.1. Geology and geomorphology of the Lawrence Municipal Airport and environs (adapted from O'Conner 1992).

The Newman terrace aggraded during the early to late Holocene; the alluvial sequences of fining-upward sediments that comprise this terrace lie approximately 3 m (9.8 ft) above the modern floodplain. The Newman terrace has the potential to contain buried soils (paleosols) with associated archeological deposits of early and middle Paleoarchaic age, with more recent materials on its tread (surface) (Ritterbush and Hesse 1996:16-17). In Douglas County, the Newman terrace fill mostly has been removed by erosion (O'Conner 1992); however, the LWC terminal complex and runways are situated on a rare expanse of this terrace surface (Shortridge and Shortridge 2001:8). Due to its potential for buried soils and associated archeological materials, the Newman terrace was the primary focus of the geoarcheological research completed for this investigation.

The Holliday terrace complex, which is approximately 2 m (6.6 ft) above the modern floodplain, is late-Holocene in age. Near Bonner Springs, Kansas, a cutbank exposure revealed two paleosols in Holliday terrace fill. Radiocarbon ages determined on well decayed vegetal matter were 4290 ± 310 B.P. (lower soil) and 1210 ± 50 B.P. (upper soil) (Johnson 1987). Based on these dates, the Holliday terrace complex has the potential to contain late Paleoarchaic, Early Ceramic, Middle Ceramic, and Late Ceramic archeological deposits, with more recent materials on the tread. The modern floodplain is dominated by sandier textures, and includes intermediate river meander forms, and former river meander scars. A single oxbow dominates the western edge of the LWC, and a series of massive meander scars indicative of a former location of the river are clustered along the southern edge of the LWC (Dort 2009:34; Figures 2.2 and 2.3).

Vegetation

The native vegetation of Douglas County is a diverse mosaic of tallgrass prairie, bluestem-grama mixed grass prairie, oak-hickory forest, and savannah and freshwater marsh vegetation (Küchler 1974). In other words, each plant community clusters in patches throughout Douglas County. For example, riparian forest, savannah, and freshwater marsh vegetation are confined to the Kansas River floodplain (Mandel 2006), while prairies are confined to the uplands (Ritterbush and Hesse 1996). The mixed prairie is dominated by big bluestem (*Andropogon gerardi*) and blue grama (*Bouteloua gracilis*) (Küchler 1974). The oak-hickory forest consists of white oak (*Quercus alba*), red oak (*Q. borealis*), bitternut hickory (*Carya cordiformis*), and shagbark hickory (*C. ovata*) (Mandel 2006). Along the Kansas River, cottonwood (*Populus deltoids*), hackberry (*Celtis occidentalis*), willow (*Salix* sp.), elm (*Ulmus* sp.), and other shrubby vegetation dominate. In marshy areas, prairie cordgrass (*Spartina pectinate*) and cattails (*Typha latifolia*) are found (Ritterbush and Hesse 1996).

Climate

The modern climate of Lawrence, Kansas, is continental, characterized by large summer and winter temperature variations. Mean high January and July temperatures are 38º F (3.3 ºC) and 89º F (31.7 ºC), respectively. Douglas County lies within the moist subhumid climatic zone where precipitation exceeds evapotranspiration (Thornthwaite 1948). Average annual rainfall is 39.92 inches, and average annual snowfall is 13 inches (U.S. Climate Data 2015).

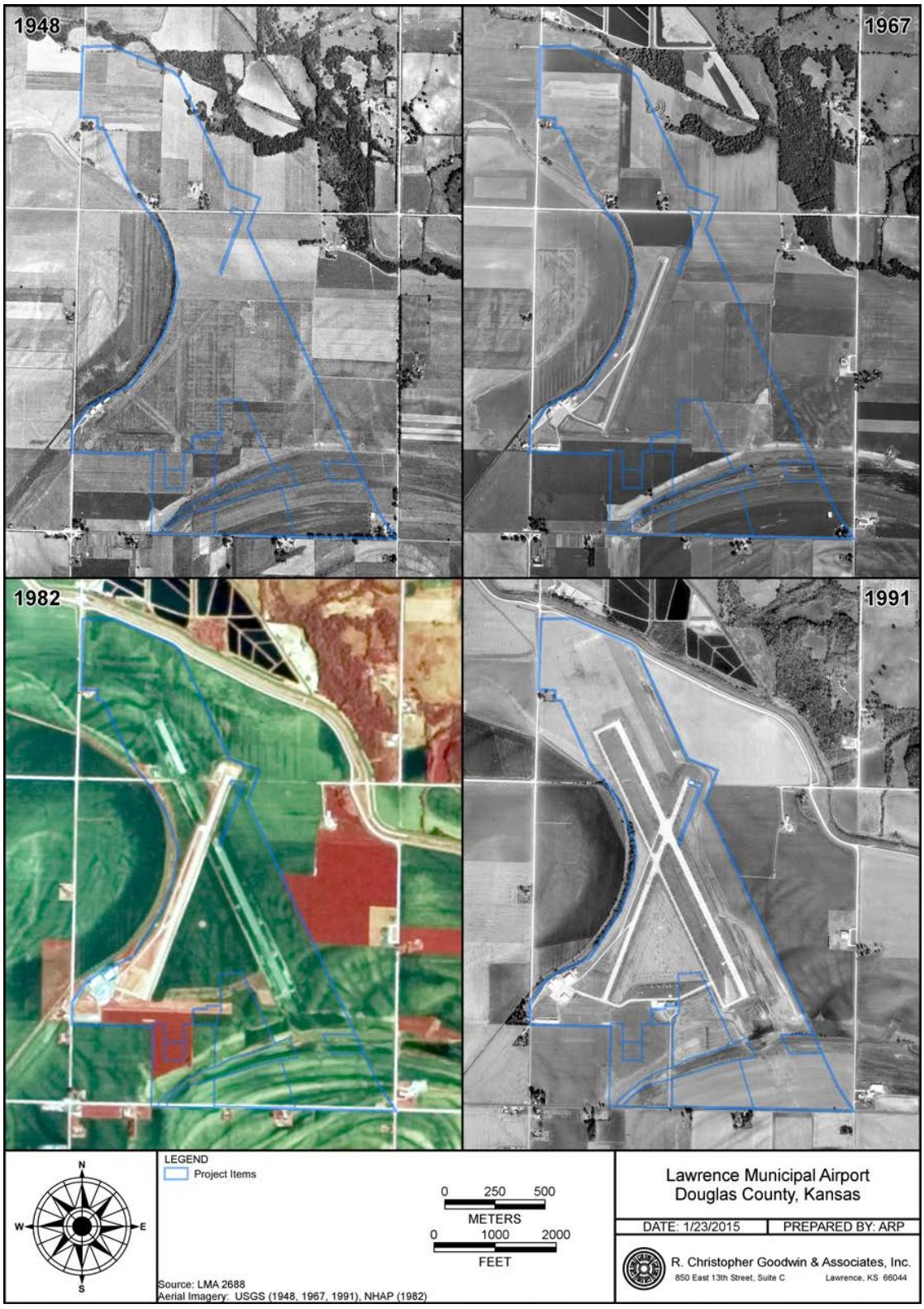

Figure 2.2. Aerial imagery of the Lawrence Municipal Airport in 1948, 1967, 1982, and 1991 (adapted from USGS 1948, 1967, 1991; National High Altitude Photography [NHAP] 1982).

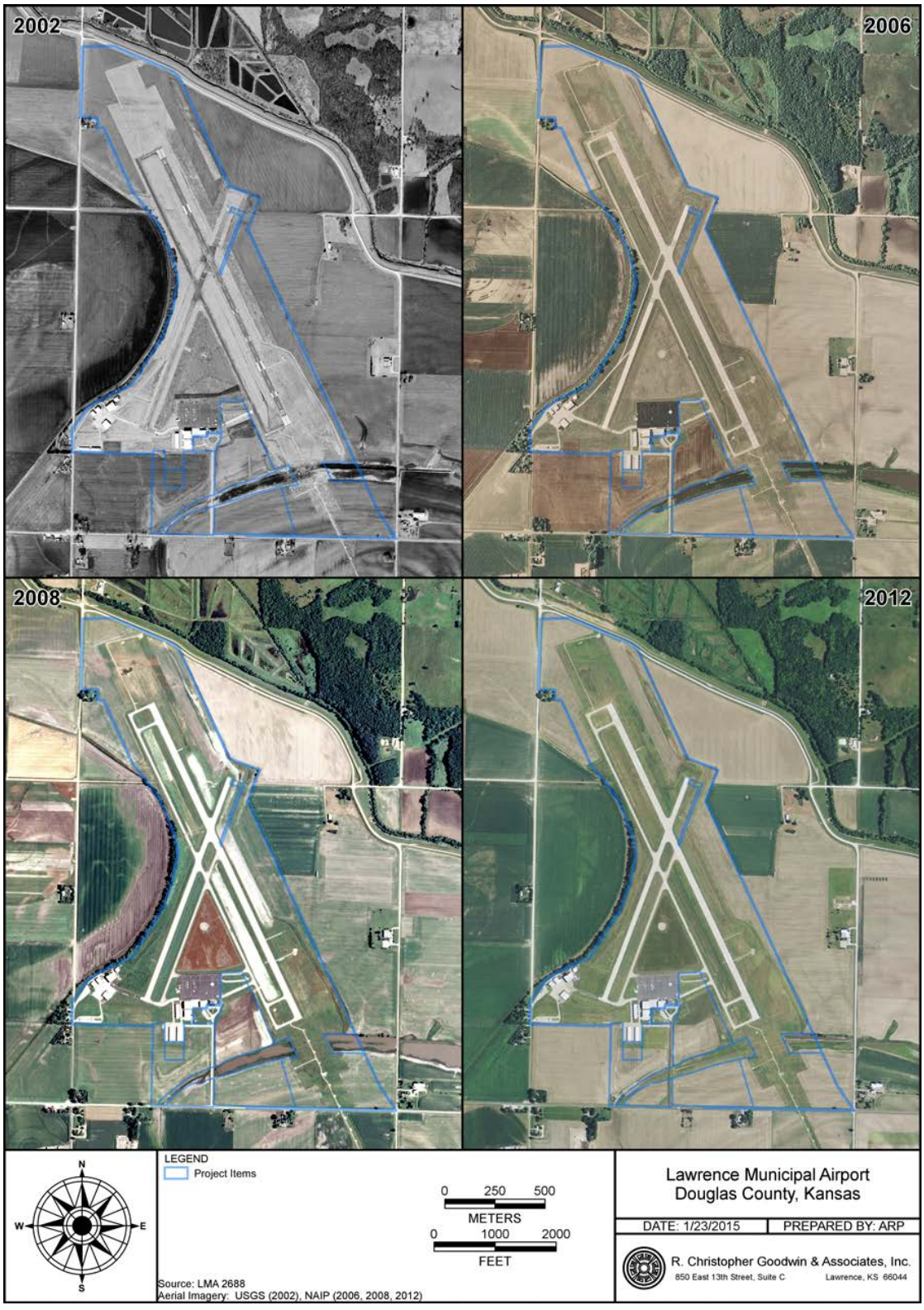

Figure 2.3. Aerial imagery of the Lawrence Municipal Airport in 2002, 2006, 2008, and 2012 (adapted from National Agricultural Imagery Program [NAIP] 2006, 2008, 2012; USGS 2002).

Soils

Five official soil series are mapped within the LWC project area: Bismarkgrove, Eudora, Kimo, Reading, and Rossville (Soil Survey Staff 2015) (Figure 2.4). Soil series data depicted in Figure 2.4 were obtained from the Natural Resources Conservation Service (NRCS) Soil Survey Geographic database (SSURGO 2.2) (Soil Survey Staff 2007). The Bismarckgrove series typically formed on floodplain steps in silty alluvium, but sandier strata are common. A typical pedon consists of Ap-A-Bw-C1-2C2. The Eudora series formed in coarse silty or loamy alluvium on floodplain steps; a typical pedon has Ap-A-C1-C2-C3 horizonation. The Kimo Series is associated with alluvial clayey and loamy parent material in former channels, oxbows, and floodplain steps. A typical pedon consists of Ap-A1-A2-AC-2C1-2C2 horizonation. The Reading series consists of very deep, well drained or moderately well drained soils that formed in silty to clayey alluvium on floodplain steps and low stream terraces. A typical pedon consists of Ap-A-Bt1-Bt2-Bt3-C; argillic horizons are a diagnostic feature of this series. The Rossville series formed in silty alluvium on the Newman terrace. A typical pedon consists of Ap-A1-A2-Bw1-Bw2-BC horizonation with "occasional buried soils deeper than 178 cm that contain higher clay content than the series allows" (Soil Survey Staff 2015). In the LWC project area, RCG&A classified the Rossville series as high sensitivity for archeological resources because it possesses the greatest potential for buried soil horizons (Figure 2.4).

Historic Land Use

Prior to the construction of LWC, the area was rural, and primarily agricultural. This land use pattern still prevails (Coffman Associates, Inc. 2012:1-5). Aerial images document historic changes in land use at LWC and its environs from 1948 to 2012 (adapted from USGS 1948, 1967, 1991, 2002; NAIP 2006, 2008, 2012; NHAP 1982) are presented in Figures 2.2 and 2.3. The images capture the progression of LWC from sod to asphalt runway infrastructure, and the construction of the main terminal complex. In particular, Figure 2.3 documents construction-related ground disturbances in 2002 and 2008 that contributed to the development of the sensitivity model presented in Chapter 5.

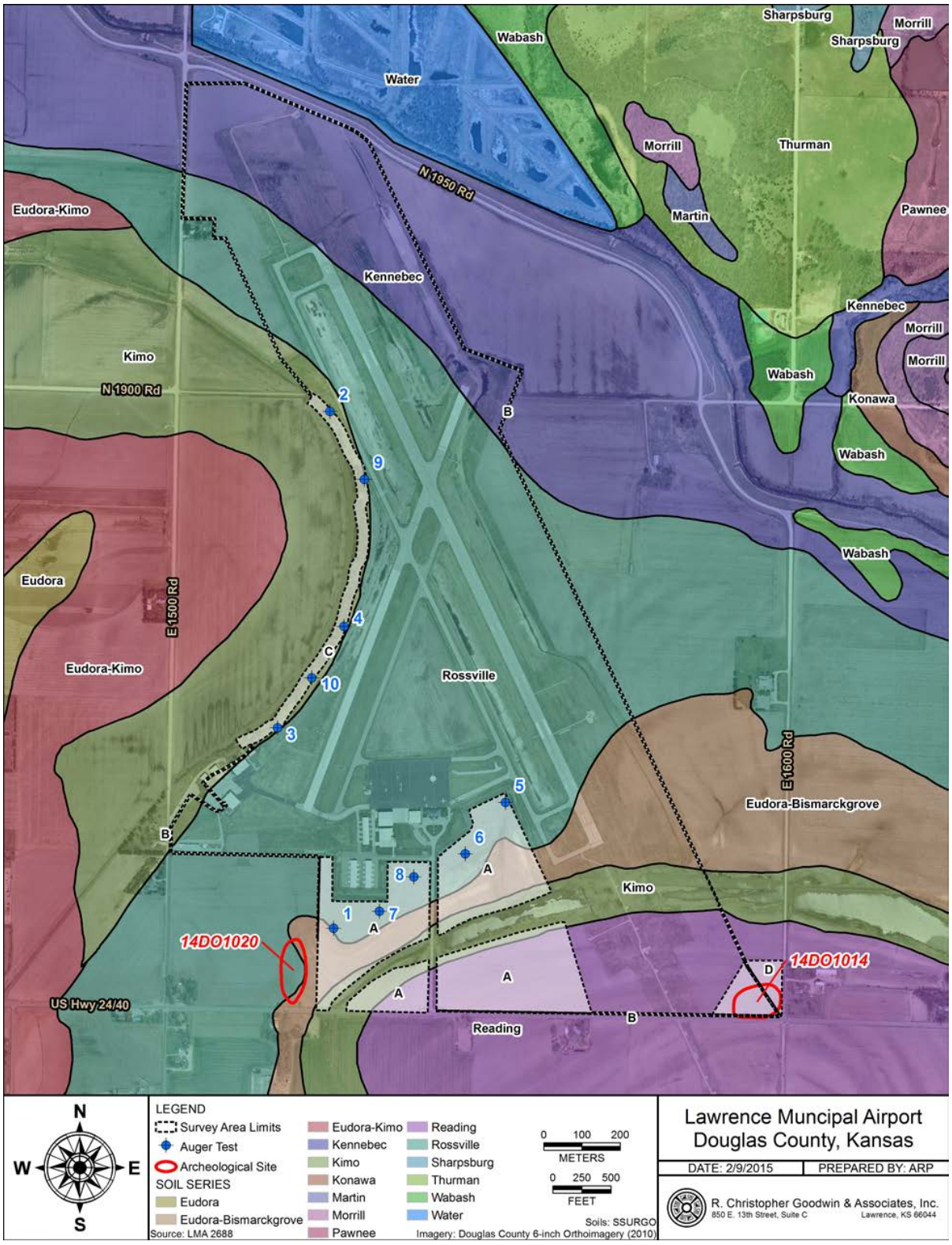

Figure 2.4. Detail map of soil series (SSURGO), the survey limits of Areas A-D, and auger tests at the Lawrence Municipal Airport and environs.

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Chapter 3
PREHISTORIC AND HISTORIC CONTEXTS

Kansas Prehistory

The earliest evidence of human occupation in Kansas dates to the end of the Pleistocene, ca. 11,500 years ago (ya), and is associated with evidence of extinct megaufauna and distinctive lanceolate spear points. The Paleoarchaic period spans the interval from 11,500-2,000 ya, and was characterized by economies reliant on the hunting and gathering of wild plant and animal resources (Blackmar and Hofman 2006).

The appearance of ceramic container technology and domesticated plants in the archeological record of Kansas mark the beginning of the Early Ceramic period (A.D. 1-1000). During this period, people became increasingly sedentary and evidence of pottery use became widespread. The bow and arrow replaced the spear thrower during this period. Early Ceramic period cultural complexes identified in western Missouri and eastern Kansas include Kansas City Hopewell, Greenwood, Grasshopper Falls, and Cuesta (Hoard and Banks 2006; Logan 2006).

During the Middle Ceramic period (A.D. 1000-1500), people of this area generally lived in small farmsteads or villages and grew the staple crops of corn and beans. By the end of this period, a duel economy of corn agriculture and bison hunting developed on the Great Plains. The Pomona variant and Steed-Kisker phase are archeological cultures identified in eastern Kansas and western Missouri during this period (Roper 2006; O'Brien and Wood 1998).

During the Late Ceramic (A.D. 1500-1800) period, the Kansas River valley was occupied by the Kansa and Osage tribes, and visited by a number of European explorers and traders. Many eastern Native American tribes were relocated to reservations in western Missouri and eastern Kansas during this period. Traditionally, Kansas prehistory ends at about A.D. 1541 with the Spanish explorer Coronado's historic journey to visit the Wichita villages in central Kansas. In practice, historical records are sparse for the region until about A.D. 1825, and archeological investigations contribute significant information about the early historic period in Kansas.

Kansas History

During the early historic period (ca. 1541-1825), the Kansa Indians occupied the Kansas River valley; however, in 1825, they signed a treaty that relinquished this area to the United States government. The nineteenth century saw the forced migration of many eastern tribes to this region. In particular, the Delaware and Shawnee tribes were gradually moved westward through a series of treaties with the United States (Obermeyer 2009; Shortridge and Shortridge 2001:9). In 1829-1831, the Delaware moved to lands in Kansas that were vacated a few years earlier by the Kansa (Obermeyer 2009; Unrau 1991). In what became Douglas County, Delaware lands were north of the Kansas River, while land south of the river was part of the Shawnee Reservation. The Shawnee immigrated to this area in 1825 (Shortridge and Shortridge 2001:9). The Kansas Delaware reservation was reduced in size through a series of treaties in 1854, 1860, and 1866. In 1854, they ceded the Delaware outlet, a strip of land that extended west of the main reservation, and other lands (Kappler 1904). The 1860 treaty allotted the reservation lands to members of the tribe and, in the 1866 treaty, the Delaware gave up the remainder of their land and moved to Indian Territory (Kappler 1904).

In May 1854, Kansas became a territory of the United States. Euroamerican settlers had begun staking claims in the Lawrence area before it was officially open for settlement (Dary 1992; Woodlawn Parent Teachers Association 1961), and several towns, including Lawrence, were founded within months of Kansas becoming a territory (Shortridge and Shortridge 2001:9). The City of Lawrence was established in the northeastern corner of an area ceded by Shawnees to members of the New England Emigrant Aid Company (originally the Massachusetts Emigrant Aid Company). The New England Emigrant Aid Company was founded to help keep Kansas from

becoming a slave state. The company raised money and recruited settlers to move to Kansas to support its antislavery agenda (Kansas Historical Society 2013). In June 1854, the New England Emigrant Aid Company sent two scouts, Charles Branscomb and Dr. Charles Robinson, to identify a good location for a townsite. By 1 August 1854, the first group of New England Emigrant Aid Company recruits had arrived in Kansas Territory (Cordley 1895). The City of Lawrence was named for Amos Lawrence, a strong supporter of the New England Emigrant Aid Company (Shortridge and Shortridge 2001:10).

At the same time Lawrence was founded, settlers staked claims to land north of the Kansas River in present day North Lawrence and Grant Township, where the Project is located. When Douglas County was organized by the Territorial Legislature in 1855, present-day Grant Township and North Lawrence were part of Jefferson County (Woodlawn Parent Teachers Association 1961). At that time North Lawrence was called Jefferson, presumably after the county. The first post office was established in Jefferson in 1862. In the late 1860s, Grant Township was incorporated into Douglas County after the Kansas Legislature partitioned it from Sarcoxie Township in Jefferson County (Cutler 1883). The annexation of Grant Township into Douglas County meant the City of Lawrence was more centrally located in the county, and supported its claim to become the county seat.

From the mid 1800s until 1911, Dr. Charles Lawrence Robinson and his wife owned Section 17, Township 12S, Range 20E where LWC is situated. In addition to being a founder of the City of Lawrence, Robinson was a prominent politician, businessman, education advocate, farmer, and abolitionist. Born in 1818 and raised in Massachusetts, he trained as a medical doctor. After his education, Robinson worked as a teacher, practiced medicine, and married. In 1846, his wife, Sarah (née Adams), passed away. Three years later, in 1849, he traveled to California for the gold rush. In 1851, he returned to his home state of Massachusetts, where he married his second wife, Sara Tappan Doolittle Lawrence. As described above, Robinson, traveled to the nascent Kansas Territory as a representative of the New England Emigrant Aid Company in 1854. Sara followed him to Kansas in 1855 (Keating 2015). Charles and Sara made their home in Lawrence and later moved to Grant Township. An active Free-State advocate prior to Kansas' statehood, Robinson was elected the first governor of the state in 1861, and served in that position until 1863 (National Governors Association [NGA] 2011). While governor, Robinson was associated with a financial scandal and impeached; however, he was later acquitted of the charges (Collins 2007:203-218). In 1874 and again in 1876, Robinson served in the Kansas Legislature. He was on the first Kansas Board of Regents, and, from 1887-1889, was president of Haskell Institute (Blackmar 1902:292; Woodlawn Parent Teachers Association 1961:13). Robinson also served as president of the Kansas Historical Society from 1879-1880 and continued to be a public figure in Kansas until his death in 1894 (Corbin 1969). Upon his death, much of his land, including most of LWC property, was deeded to KU; however, Sara Robinson continued to own and manage the property until her death in 1911 (*Christian Register* 1911).

Lawrence Municipal Airport

LWC was dedicated in October 1929, which makes it one of the longest continuously operating airports in Kansas (City of Lawrence, Kansas 2000-2015b). At its inception, LWC consisted of four turf runways constructed on land owned by KU. Shortly thereafter, in the mid 1930s, several improvements, including a cinder runway surface, boundary markers, an aircraft apron, and two hangers were undertaken (Coffman Associates, Inc. 2012:1-2). Over time, the runways have been extended and modernized (Figures 2.2 and 2.3). At the airport's opening, the longest runway was 2,600 ft long; and by 1941 the longest runway was 3,200 ft. Additional improvements to the airport facilities took place in the 1950s and 1960s when LWC first received federal funding (Coffman Associates, Inc. 2012:1-2). In the late 1970s, the airport and associated property were transferred to the City of Lawrence. Since then LWC has continued a variety of maintenance and modernization projects (City of Lawrence, Kansas 2000-2015b; Coffman Associates, Inc. 2012:1-3).

ADG began their partnership with the City of Lawrence in 1990. Today, LWC averages 120 daily flight operations and is about 445 acres in size (City of Lawrence, Kansas 2000-2015b; Coffman Associates, Inc. 2012:1-2). Its longest runway is 5,700 ft; this size of runway enables the airport to better serve medium to large business jets (Coffman Associates, Inc. 2012).

Chapter 4
PHASE I BACKGROUND RESEARCH

As specified in the *Kansas SHPO's Guide to Archeological Survey, Assessment, and Reports* (Epperson, Banks, and Stein 2010), RCG&A completed archival Phase I background research within a study area defined as an area encompassed by the LWC property plus a one-mile radius extending outward from the LWC property boundary. The research was conducted primarily using the viewer features available in two online databases: the Kansas Historical Society (KSHS) Archeological Inventory (KSHS 2009), and the Kansas Historic Resources Inventory (KHRI) (SHPO, KSHS 2015).

Archeological Surveys

A Phase I planning study (B1539) and three Phase II archeological surveys (B3169, B1273, B1927) intersect the study area. B1539, a Phase I planning study of the Kansas City-Topeka corridor described the potential impacts of development on numerous sites in Douglas and surrounding counties, but no fieldwork was conducted in connection with the project (Adair et al. 1984).

Survey B3169 was conducted in 1974 for the U.S. Army Corps of Engineers by KU student Larry J. Zimmerman in support of planned levee construction and channel modification along Mud Creek. Three archeological sites were recorded during the pedestrian survey: 14DO94, 14DO95, and 14DO96 (Zimmerman 1974:3-4).

Survey B1273 was conducted on 26 February 1985 by William B. Lees and Barry G. Williams in support of a bridge structure replacement project for the Highway Archeological Salvage Program - Kansas State Historical Society (Lees 1985). No archeological sites were identified during the pedestrian survey.

From September 1995 to May 1996, Survey B1927 involved pedestrian inspection of approximately 1,056 acres distributed across 35 survey tracts in Douglas County, Kansas. The survey specifically targeted areas of high potential for development as determined in consultation with the Lawrence-Douglas County Metropolitan Planning Office. The fieldwork was directed by Lauren Ritterbush and India Hesse for the KU Museum of Anthropology, with volunteer labor. Survey B1927 recorded 15 new sites, and revisited 17 previously recorded sites (Ritterbush and Hesse 1996:i-ii). The survey recorded four new sites in the study area: 14DO1014, 14DO1018, 14DO1019, and 14DO1020.

Archeological Sites

Seven archeological sites have been recorded within a one-mile radius extending outward from the LWC property boundary. Of the three sites recorded by Zimmerman (1974:3-4), 14DO94 and 14DO95 yielded prehistoric chipped stone flakes, and 14DO96 was described as yielding prehistoric chipped stone debitage mixed with modern materials, including plastics. Ritterbush and Hesse (1996:31-32) examined the artifacts collected from 14DO94, and reported that the items curated at the KU Museum of Anthropology were chert gravels, not cultural artifacts.

In their survey of Douglas County, Ritterbush and Hesse (1996) recorded four sites in the study area: 14DO1014, 14DO1018, 14DO1019, and 14DO1020. Historic Euroamerican Site 14DO1014 was revisited during the current investigation, and is discussed in detail in Chapter 6. Site 14DO1018 was described as a large (~15 acre) prehistoric/historic site on the surface of the Holiday terrace. Prehistoric artifacts included chipped stone debitage, a few bifaces, and two small unclassifiable ceramic sherds. A light scatter of historic domestic debris also was noted (Ritterbush and Hesse 1996:63-64). The two local collectors who discovered 14DO1019 and 14DO1020 reported finding several biface fragments, a piece of incised hematite, and a small triangular square-stemmed point, mostly at 14DO1019. Sites 14DO1019 and 14DO1020 are situated on the eastern edge of the Newman terrace, and are separated by US Hwy 24/40. At 14DO1019, the Phase II survey yielded a light to moderate scatter of chipped stone

flakes concentrated along the terrace edge, and 14DO1010 produced a very light scatter of chipped stone flaking debris. Phase III National Register assessment was recommended for both sites to ascertain their age, function, relationship, and condition (Ritterbush and Hesse 1996:64-65).

Kansas Historic Resource Inventory

Of the 42 structures and buildings recorded in the study area, 41 are extant. The Charles Robinson House (045-0000-00001) is listed in the KHRI inventory as a demolished property (Table 4.1). Three properties associated with the historic Tepee Junction Indian Village on Highway 24/40 are eligible for the NRHP; 24 KHRI properties are not eligible for the NRHP; and, the National Register eligibility of the remaining 15 is unassessed. During the current investigation, no historic buildings or structures were noted in the survey areas defined in Figure 1.3.

Table 4.1. List of 42 KHRI properties registered in the study area.

KHRI Number	Name	National Register Eligibility Status
045-3354	Indian Village Store	Eligible
045-3355	Indian Village Restaurant	Eligible
045-3356	Indian Village Sign	Eligible
045-0000-00001	Robinson, Charles, House (Demolished)	Not Eligible
045-3010-02482	--	Not Eligible
045-3010-02483	--	Not Eligible
045-3353 (same as 045-5534)	Gas Station	Not Eligible
045-5495	Johns Outbuilding	Not Eligible
045-5496	Outbuilding 2	Not Eligible
045-5497	Shop	Not Eligible
045-5516	Knop Garage	Not Eligible
045-5525	A. P. Miller House	Not Eligible
045-5526	Garage	Not Eligible
045-5527	House	Not Eligible
045-5528	Silo	Not Eligible
045-5529	William Stiner House	Not Eligible
045-5530	Garage	Not Eligible
045-5532	Loafing shed	Not Eligible
045-5533	S.A. Gillette House	Not Eligible
045-5535	House	Not Eligible
045-5536	Garage	Not Eligible
045-5537	Airport Motel office	Not Eligible
045-5538	Airport Motel E	Not Eligible
045-5539	Airport Motel unit 1W	Not Eligible
045-5540	Airport Motel unit 2W	Not Eligible
045-5542	A. Eastman House	Not Eligible
045-5543	Shed	Not Eligible
045-4245	White School	Potentially Eligible (Not Assessed)
045-5541	W.H. Wible House	Potentially Eligible (Not Assessed)
045-0000-00589	Robinson, Charles, Barn	Potentially Eligible (Not Assessed)
045-4548	Morgan Barn	Potentially Eligible (Not Assessed)
045-5493	Frank H. Johns House	Potentially Eligible (Not Assessed)
045-5494	Frank H. Johns Garage	Potentially Eligible (Not Assessed)
045-5515	Albert Knop House	Potentially Eligible (Not Assessed)
045-5517	Knop Barn	Potentially Eligible (Not Assessed)
045-5519	Chicken coop	Potentially Eligible (Not Assessed)
045-5520	Garage	Potentially Eligible (Not Assessed)
045-5521	Miller Barn	Potentially Eligible (Not Assessed)
045-5522	Milk house	Potentially Eligible (Not Assessed)
045-5523	Chicken coop 2	Potentially Eligible (Not Assessed)
045-5524	Outbuilding	Potentially Eligible (Not Assessed)
045-5531	William Stiner Barn	Potentially Eligible (Not Assessed)

Cemeteries

The Maple Grove Cemetery is located approximately 0.75 miles west of the LWC. The cemetery was established in the 1860s, and currently has 1,356 interments (Find A Grave 2008). The cemetery is maintained by the City of Lawrence.

Linear Transportation Properties

Six historic linear transportation properties intersect the Project study area, but because none intersect the Project boundary, these resources were not researched in detail. Two historic roads/trails are mapped in the KSHS Archeological Inventory as GLO lines (KSHS 2009): the Lawrence to Leavenworth Road, and the Lawrence to Oskaloosa Road. Two segments of the Union Pacific Railroad and three historic highways intersect the study area: US Hwy 24/40, US Hwy 24/59, and the Kansas Turnpike (Interstate 70). US Hwy 24/40 abuts the southern boundary of Area A, the largest of the four survey areas.

Historic Maps and Aerial Imagery

In addition to the KSHS databases, a variety of historic maps, atlases, and aerial images were compiled and reviewed. Most of the archival map and aerial imagery research pertained to RCG&A's revisit of 14DO1014, and is presented in Chapter 6. Contemporary and historical map and aerial imagery sources consulted for this study include: aerial photographs available from the Douglas County Public Works Department (1937), the USGS (1948, 1967, 1991, 2002, 2010), NHAP (1982), and the NAIP (2006, 2008, 2012); USGS 7.5-minute topographic quadrangles (USGS 1978a, 1978b); and historic plat books and atlases (F. W. Beers & Co. 1873; George A. Ogle & Company 1902, 1921; Armstrong and Soudea 1909).

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Chapter 5
RESEARCH DESIGN & METHODS

Chapter 5 describes the research objectives of this study, presents the results of the sensitivity model, and documents the methods utilized during the Phase II archeological and geoarcheological investigations.

Research Objectives

To satisfy the Project requirements outlined in the SHPO letter (Appendix A) and survey guidelines (Epperson, Banks, and Stein 2010), RCG&A identified five research objectives specific to this study.

1. To aid in the identification of archeological evidence in areas of differing levels of ground disturbance and sensitivity, RCG&A used the information assembled in Chapters 2-4 to develop an archeological sensitivity model to delineate areas for:
    a. exclusion from intensive survey fieldwork (low sensitivity);
    b. pedestrian transect survey only (moderate sensitivity);
    c. shovel testing (high sensitivity for near-surface archeological deposits at depths of 0-70 cm (0-28 in) bgs; and,
    d. auger testing (high sensitivity for deeply buried archeological deposits at depths greater than 70 cm (28 in) bgs.
2. Perform Phase II archeological survey fieldwork to identify or update archeological sites within the Project areas designated for survey.
3. Apply the National Register criteria for evaluation to assess the significance and integrity of identified archeological properties.
4. Assess the geoarcheological sensitivity of a terrace escarpment (Area C) where the exact placement of the perimeter fence (Item 4) has yet to be determined.
5. Develop a geoarcheological model to delineate areas of archeological concern for drainage design (Item 1) in Area A.

Sensitivity Model Development

To develop the sensitivity model, RCG&A assembled recent and historic aerial imagery; surface contours; hydrology; soil series; historic plat maps; digital shapefiles of Project Items; and the boundaries of the archeological sites identified in or adjacent to LWC. For each Project Item, a two-dimensional sensitivity model was extracted from the assembled data sets to delineate zones of high, moderate, and low potential for historic and prehistoric archeological evidence within the survey areas defined by the APEs of Items 1, 2, 3, 4, and 8.

Zones of high sensitivity for archeological evidence required (1) intersection with a recorded archeological site (14DO1014), and/or (2) association with the Rossville soil series on the Newman terrace as refined by surface topography. Areas of moderate sensitivity correspond to undifferentiated Quaternary alluvium (Qal) as mapped by O'Conner (1992) (see Figure 2.1), which compared favorably to the mapped extents of the Kimo, Eudora-Bismarckgrove, Kennebec, and Reading soil series (Figure 2.4).

Areas of low sensitivity correspond to areas of historic drainage channel, or to evidence of prior ground disturbance/development as indicated in georeferenced aerial imagery (Figures 2.2 and 2.3), or to the positions of buried utilities identified during the utility locate process. For example, just prior to the commencement of fieldwork, RCG&A reclassified Item 7 from high to low probability and excluded it from archeological investigation because two buried gas pipelines and buried electrical lines associated with runway lights were found to intersect the item boundary, and evidence of ground disturbances associated with runway/taxiway construction

and drainage improvements were noted in the aerial imagery. Likewise, parts of Items 1, 2, 3, 8 in Area A were classified as low sensitivity due to evidence of prior development activity visible in the assembled time series of aerial imagery (Figures 2.2-2.3).

The sensitivity model output consists of shapefiles and maps that delineate zones of high, moderate, and low sensitivity within each Project Item and survey area. Figure 5.1 depicts the sensitivity zones within the four survey areas (Areas A-D). Table 5.1 provides acreage totals by survey area and sensitivity zone. RCG&A defined Area A to encompass the moderate to high sensitivity APEs of adjacent Items 1, 2, 3, and 8, but to exclude the zones classified as low sensitivity. Item 4 was divided into three discrete survey areas (Areas B, C, and D) to differentiate segments of moderate sensitivity APE (Area B) from segments of high sensitivity APE (Areas C and D). Area C is associated with an erosional escarpment of the Newman Terrace deemed to have high sensitivity for potentially shallow or exposed archeological content that elsewhere is buried at considerable depth beneath the terrace tread. Area D corresponds to the intersection of Item 4 with the revised boundary of Site 14DO1014 (this report).

The combined acreage of the APEs for Items 1, 2, 3, 4 and 8 totals 89.16 ac. Of that total, 25.20 acres classified as low sensitivity were excluded from the Phase II investigations, and 63.96 acres of the APEs were surveyed. Supplemental survey coverage associated with Areas A (0.2 acres), C (6.78 acres), and D (4.71 acres) added 11.69 acres, bringing the total acreage surveyed to 75.65 acres (Figure 1.3). Table 5.1 summarizes the acreage totals by area and sensitivity zone. Zone-specific field methods are described in the methods sections that follow.

Table 5.1. Survey acreage totals by area and sensitivity zone.

Area	Sensitivity Zones in acres		Area Totals
	Moderate	***High***	
A	41.28	14.42	*55.70*
B	6.77	--	*6.77*
C	--	8.04	*8.04*
D	--	5.14	*5.14*
Sensitivity Zone Totals	*48.05*	*27.6*	*75.65*

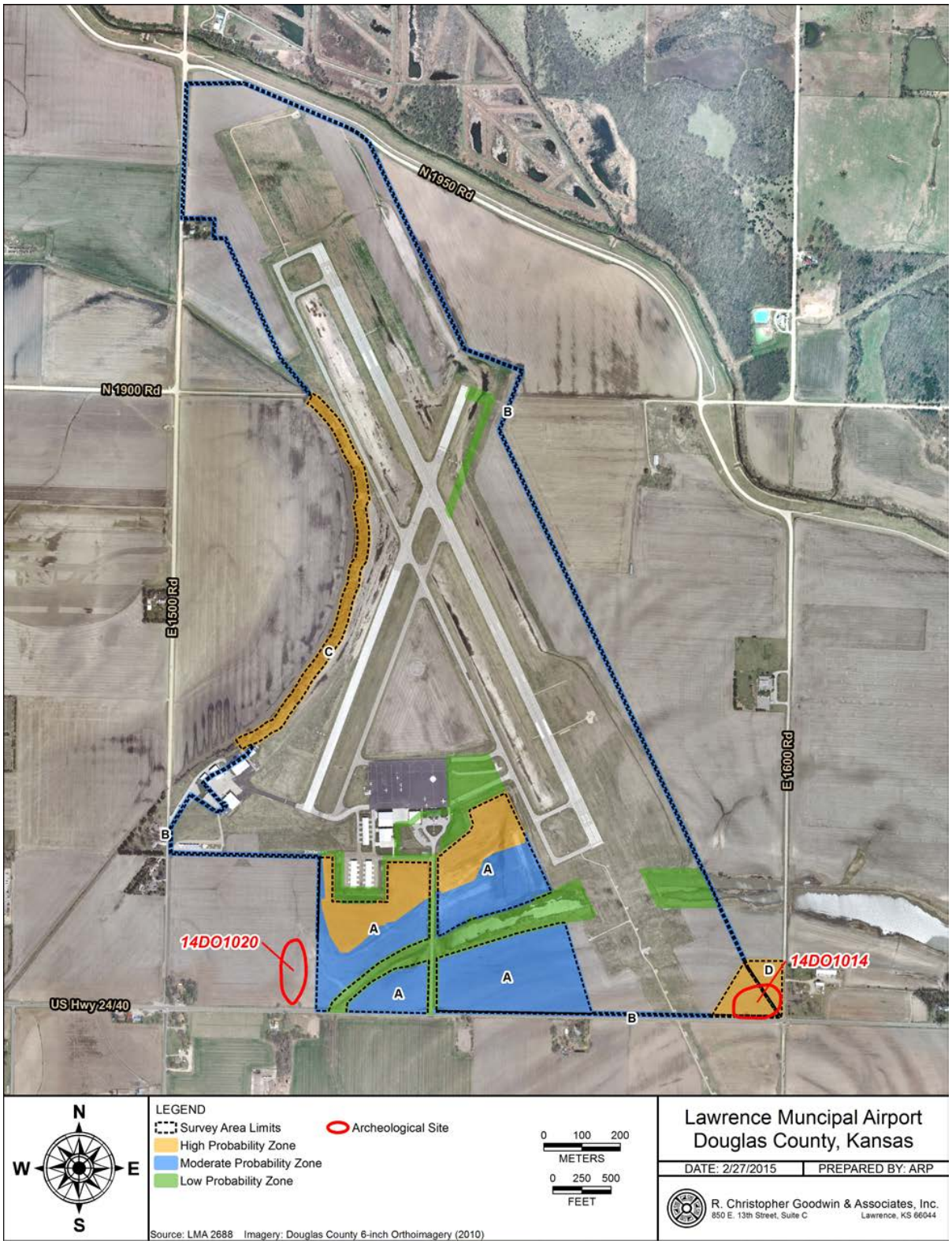

Figure 5.1. Zones of low, moderate, and high archeological sensitivity within the survey area boundaries (Areas A, B, C, and D). Areas classified as low sensitivity were excluded from Phase II survey.

Methods

RCG&A completed a Phase II archeological inventory of four areas of high and moderate sensitivity as depicted in Figure 5.1. The fieldwork was based on methodologies that provide for consistency, quality control, and for the precise geospatial recordation of all Phase II activities and cultural properties identified during survey.

Geospatial Data Collection and Management

Spatial data were collected digitally in the North American Datum of 1983 (NAD83), Zone 14 North Universal Transverse Mercator (UTM) coordinate system using Trimble GeoXH GeoExplorer 6000 Series handheld Global Positioning System (GPS) receivers controlled by Trimble TerraSync software. These GPS units feature integrated satellite-based augmentation system (SBAS), using the wide area augmentation system that allows for decimeter real-time accuracy. Positional accuracy of collected spatial data was further improved using GPS base station carrier and/or code post-processing differential correction. These accuracies well exceed the 15.24-30.49 m (50-100 ft) horizontal feature position tolerance recommended by the Federal Geographic Data Committee's (FGDC) Geospatial Positioning Accuracy Standards for A/E/C and Facility Management for historic preservation projects (FGDC 2002:4-16). Categories of spatial data collected by the field team include: survey area boundary points, shovel and auger test positions and results, surface artifacts, site boundary points, landscape features, utility markers, etc. Spatial data were authored, analyzed, and managed using Trimble Pathfinder Office 5.60, ESRI ArcGIS 10.2, and ACD Canvas 14 software platforms. Surface contours for field maps were generated in ArcGIS 10.2 3D Analyst using LIDAR (USGS 2006) and National Elevation Dataset (NED) 1/9 arc-second (3 m) (USGS 2000) digital elevation models.

Phase II Field Methods

In zones of moderate and high sensitivity that averaged at least 40 percent gsv, the archeological inventory consisted of pedestrian visual inspection along the entire length and width of the designated survey area. The pedestrian survey utilized teams of archeologists spaced no more than 15 m (49.2 ft) apart to ensure adequate and efficient transect coverage of the survey areas.

In all high sensitivity zones, pedestrian transect survey was augmented by systematic shovel testing. Two business days prior to the commencement of subsurface testing, RCG&A notified Kansas One-Call of the locations selected for subsurface testing. As per Kansas SHPO survey guidelines, shovel tests were excavated at 15 m (49.2 ft) intervals. Each shovel test measured a minimum of 35 cm (13.8 in) in diameter, and was excavated to a minimum depth of 60 cm (23.6 in), or at least 10 cm (3.9 in) into subsoil. All shovel test fill was screened through 0.635 cm (0.25 in) hardware cloth; extremely wet soils and clays were hand-sifted, trowelled, and examined visually for cultural material. Each shovel test was excavated in 10 cm (3.9 in) artificial levels within natural strata; the fill from each level was screened separately, and artifacts were recorded in the field by depth bgs in arbitrary 10 cm (3.9 in) levels. Munsell Soil Color Charts were used to record soil color; texture and other identifiable characteristics also will be recorded using standard soils nomenclature. All shovel tests were backfilled immediately upon completion of the archeological recordation process.

Geoarcheological Investigations

The Project area is situated partly on the Holocene-age Newman terrace of the Kansas River, a landform with high potential for buried cultural deposits. To sample this potential, RCG&A anticipated the hand excavation of up to 12 auger tests to characterize terrace sediments and to prospect for buried cultural deposits at depths in excess of 3 m (9.8 ft) bgs; a total of 10 auger tests were excavated (Figure 2.4). Auger tests were spaced at 50-100 m (164-328 ft) intervals, and excavated to depths of 200-310 cm (78-122 in) bgs. As stratigraphic patterns emerged during fieldwork, the depths of auger tests were adjusted to limit the investigations to the potential maximum depth of cultural deposits.

Auger tests were excavated with a 10 cm (4 in) bucket auger to 300 cm (118 in) bgs, or until a lithologic impasse was reached. Soils excavated via auger testing were screened through 0.635 cm (0.25 in) hardware mesh. Auger test locations were numbered and mapped using a Trimble GPS unit. They were documented on standard forms used to record field data such as soil composition, stratigraphic sequences, and presence or absence of cultural materials. Soils were described using standard pedologic nomenclature (Schoeneberger et al. 2012), with buried soils designated with a lowercase "b." Appendix B contains descriptions of the stratigraphic profiles of each of the ten auger tests excavated for this Project. Buried soils were described in six of the ten auger tests; three in Area A and three in Area C.

Site Recordation

All archeological evidence identified during survey was assigned a field locus identification number, and examined to ascertain the nature, size, depth, integrity, age, and affiliation of the cultural deposits. Site 14DO1014 was updated in accordance with guidelines provided in Epperson, Banks, and Stein (2010). Delineation efforts at 14DO1014 assessed the stratigraphy, artifact density, and research potential of the site, and produced a reliable site boundary. Archeological site recordation to define the boundary of the site included the following tasks: (1) establishment of a site datum; (2) intensive surface reconnaissance of the site area; (3) excavation of tightly spaced shovel tests at 5 to 15 m (32.8 to 49.2 ft) intervals following delineation protocols established in the Kansas SHPO guidelines; (4) in-field artifact recordation; (5) plan mapping; and (6) site photography. High quality color digital photographs of the site area were taken. Scaled photos of diagnostic and other representative artifacts were shot in the field, and artifacts were described on standardized field forms following RCG&A protocols. No artifacts were collected.

Beyond the goal of identification and recordation of cultural properties, the objective of the fieldwork was to collect evidence in support of a formal recommendation of significance, or further work, for any archeological sites encountered during the survey. These assessments were be made in accordance with the National Register criteria for evaluation (36 CFR 60.4 [a-d]).

Archival Research

For historic period archeological sites, supplemental archival research often is necessary to assess significance due to a singular association with an important historical event or theme (Criterion A), or an important person or persons (Criterion B). Following completion of fieldwork to delineate the site boundary, chain of title research for 14DO1014 was conducted at the Douglas County Register of Deeds office in Lawrence, Kansas. RCG&A staff also visited the Lawrence Public Library to research Charles Robinson, and went to Oak Hill Cemetery to locate and to photograph grave markers of selected tenants of the former historic farmstead at 14DO1014. In addition, RCG&A conducted research using various genealogical databases, including FindAGrave.com and Ancestry.com. An examination of scanned state and federal census documents on Ancestry.com provided information concerning family size and composition, age, employment, and residence for the tenants who occupied 14DO1014.

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Chapter 6
RESULTS OF THE PHASE II INVESTIGATIONS

RCG&A conducted Phase II investigations at LWC from 19-23 January 2015. RCG&A field directors included Garrett Welch, M.A., Dawn Munger, M.A., and David Williams, M.A. Laura Murphy, M.A., served as project geoarcheologist. Chapter 6 describes the results of the archeological and geoarcheological fieldwork completed in the moderate and high sensitivity zones of four survey areas (Figure 5.1). As noted in Chapter 1, Items 5, 6, and 7 were excluded from survey, and therefore are not discussed in Chapter 6.

Area A

Area A, located at the main entrance of the property to the south of LWC's terminal complex, encompassed 55.70 ac, the extent of the high (14.42 ac) and moderate (41.28 ac) sensitivity zones of Items 1, 2, 3, and 8. Area A was divided into high, moderate, and low probability zones based on soils, geomorphology, slope, and the extent of agricultural terraces (Figure 6.1). The undeveloped portion of Area A located atop the Newman terrace (Rossville series) was designated as high sensitivity (Figure 2.4; Figures 6.2 and 6.3). Moderate sensitivity zones include the terrace escarpment mapped as Eudora-Bismarckgrove series, and the modern floodplain mapped as Reading series (Figure 2.4). Zones designated as low sensitivity and excluded from survey included those portions of Area A in close proximity to existing pavement and buildings, the airport access road (Airport Road) and right-of-way, and, the relict oxbow drainage channel mapped as Kimo series (Figure 2.4).

In Area A, the geoarcheological investigation consisted of the excavation of five auger tests: 1, 5, 6, 7, and 8 (Figure 6.1). Appendix B provides detailed stratigraphic profiles for each of these auger tests, none of which yielded cultural materials. The typical observed soil profile in all of the auger tests at Area A consisted of an Ap horizon and thick mollic epipedon (A1 and A2 horizons) with an average depth of 76 cm (30 in), followed by a weakly developed B horizon (Figure 6.4). In Area A, the top of a buried soil (Soil 2) was located approximately 205 cm (81 in) bgs (Figure 6.4). The buried soil at Area A consists of an A horizon with very dark brown to dark brown silty clay loam and a well-developed Bt horizon with clay films and redoximorphic concentrations. Two auger tests (5 and 6) excavated east of Airport Road revealed a nearly two meter-thick homogenous package of very fine sand between 128-300 cm (50-118 in); no buried soil was detected. The results of auger tests 5 & 6 more closely resemble the typical pedons for the Bismarckgrove or Eudora series than the Rossville series (Soil Survey Staff 2015). Given the proximity of the Eudora-Bismarckgrove series, it is probable that the Rossville soil series simply was misplotted in the portion of Area A to the east of Airport Road.

Figure 6.1. Phase II investigations of Area A.

Figure 6.2. Area A west of Airport Road: overview of the drainage channel (mid-ground) and the Newman terrace escarpment and tread (background); view is to the northwest towards Item 2.

Figure 6.3. Area A east of Airport Road: overview of the drainage channel (mid-ground) and the Newman terrace escarpment and tread (background); view is to the northeast.

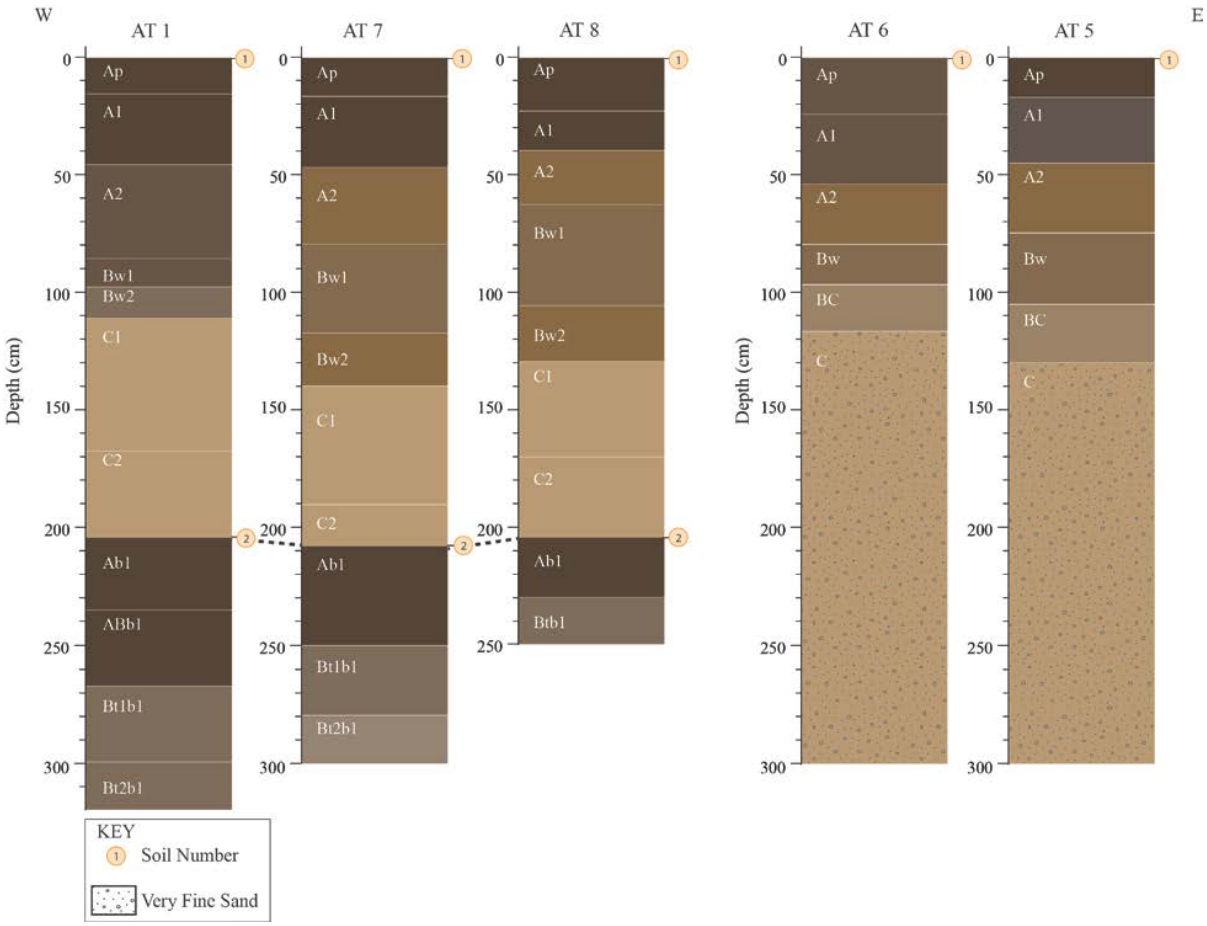

Figure 6.4. Soil stratigraphy from auger tests at Area A (west to east). All surface soils were mapped as Rossville silt loam.

The Phase II archeological investigation of Area A included a combination of pedestrian survey and shovel testing. Vegetation in Area A consisted of 30 percent grass cover and 70 percent fallow cropland; gsv ranged from 0-60 percent, with an average of 45 percent. No surface artifacts were observed encountered during the pedestrian survey. RCG&A excavated a total of 256 shovel tests to an average depth of 61 cm (24 in), with 234 excavated in high sensitivity zones and 22 excavated in moderate sensitivity zones. All 256 shovel tests were negative for cultural materials (Figure 6.1). The results of the Phase II archeological investigation of Area A demonstrate that the surface component of adjacent prehistoric archeological Site 14DO1020 does not extend onto LWC property. That said, 14DO1020 is on the western edge of a cultivated intermittent drainage (Figure 6.5). The topographic setting of Site 14DO1020 suggests that the archeological content of the site is not associated with Soil 1, but rather with Soil 2 as exposed along the intermittent drainage by ongoing cultivation.

In Area A, shovel and auger test results for the high sensitivity areas of the Newman terrace surface demonstrate negligible archeological potential at depths of 0-165 cm (0-65 in). In areas classified as high or moderate sensitivity, no additional subsurface testing is recommended for ground disturbances at depths of 0-165 cm (0-65 in). This depth was selected to provide a buffer of sterile subsoil between the maximum depth of excavation and the top of Soil 2 at approximately 200 cm (79 in) bgs.

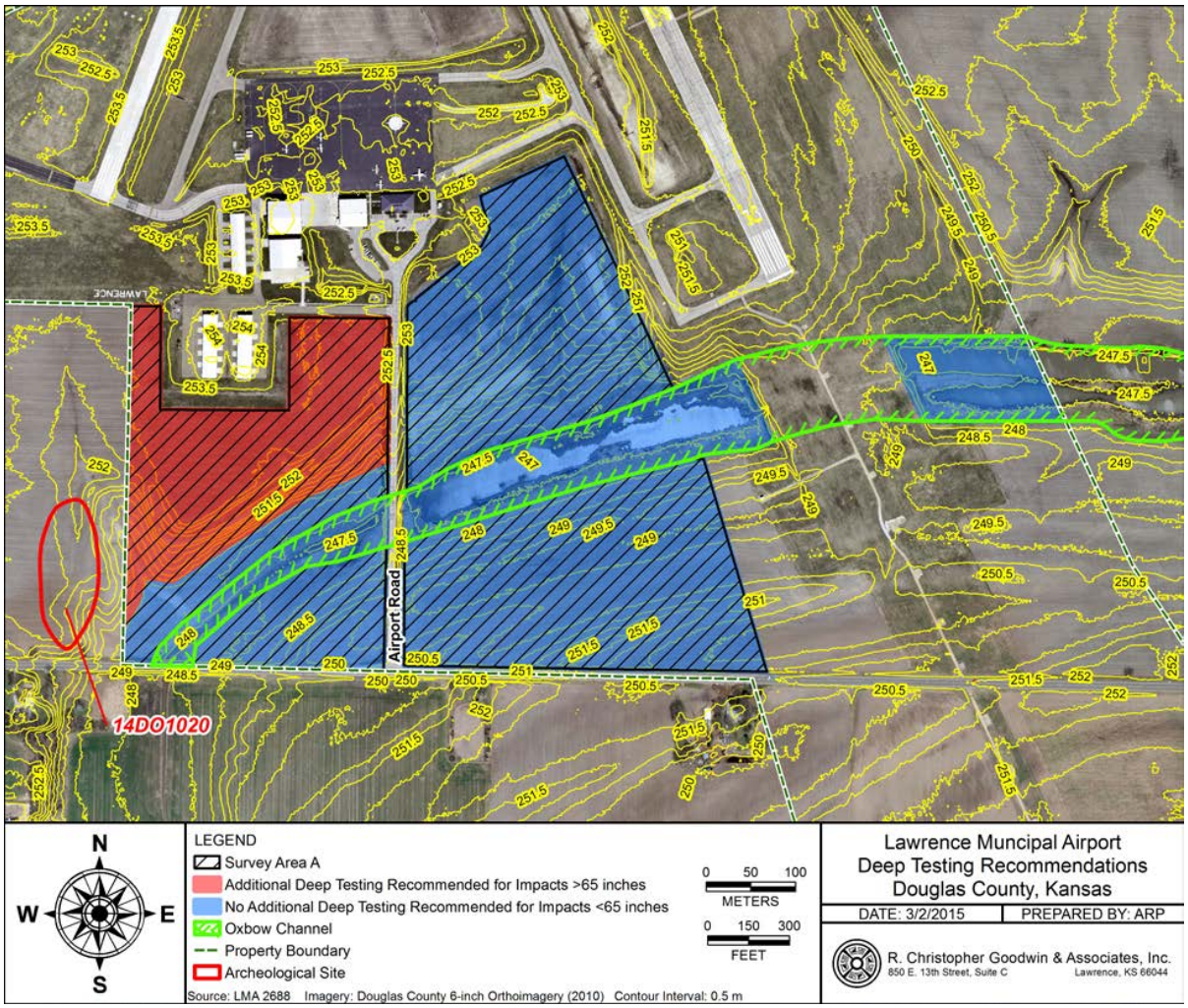

Figure 6.5. Area A deep testing recommendations for Item 1.

Based on the auger test results in Area A, below a depth of roughly 165 cm (65 in) bgs, the Newman terrace contains buried soils of late Holocene age (~4400-1100 ^{14}C yr B.P.) with high potential for associated archeological content of the Archaic to Early Ceramic Periods. As mapped in Figure 6.5, this recommendation has implications for drainage improvement design in Area A. Supplemental deep testing is recommended for any drainage improvements that (1) require excavation depths greater than 165 cm (65 in) bgs, and (2) are located west of Airport Drive on the Newman terrace (Figure 6.5). Within the tested limits of Area A, RCG&A recommends no other restrictions on subsurface disturbances (Figure 6.5).

Area B

Area B is encompasses the moderate probability zones of Item 4, the proposed LWC perimeter fence (Figure 5.1). Area B excluded two high probability segments of Item 4: Area C, an oxbow escarpment of the Newman terrace, and Area D, the recorded location of Site 14DO1014. The total acreage of Area B is 6.77 ac.

The fieldwork for Area B consisted of pedestrian survey of a 15-m wide corridor based on the fenceline digitized from a March 2014 project map supplied by ADG. Two transects were surveyed at a maximum spacing of

7.5 m across planted grasses and cultivated fields (0-90 percent gsv). No cultural materials were encountered, and no further work is recommended for Area B.

Area C

Area C corresponds to the intersection of Item 4 with a wooded escarpment of the Newman terrace along an oxbow lake at the western periphery of LWC property (Figure 6.6). The soil series mapped for this area include the Kimo silty clay loam and Rossville silt loam soil series, both of alluvial origin (Soil Survey Staff 2015). The Kimo silty clay loam is mapped along the meander scar, and the Rossville silt loam is mapped atop the tread of the Newman terrace (Figure 2.4).

Figure 6.6. Overview of Area C from E1500 Road, view is to the northeast.

In Area C, the surface of the Newman terrace has been impacted by runway construction activities. An artificial earthen berm was constructed in circa 2008 to provide erosion control and stabilization (Dale Mooney and Rick Bryant, personal communication, Jan 2015). This berm parallels the edge of the terrace along a large section of the oxbow lake in the central portion of the Item 4, and is bisected by a stormwater drain (Figure 6.7). Other disturbances include two natural gas pipelines that intersect the oxbow to the north of the levee, and a KU building complex at the southern end of the oxbow (Figure 6.8).

Figure 6.7. Area C: artificial berm on the Newman terrace tread with black landscape cloth exposed at its base; view is to the north.

In order to investigate the proposed position of the perimeter fence along the terrace escarpment, Area C was subjected to systematic shovel testing and judgmental auger testing. At this time, the exact position of the perimeter fence on the terrace escarpment has not been determined, so the entire escarpment was surveyed (8.04 ac) (Figure 6.8). A single transect of shovel tests generally was positioned along the terrace edge overlooking the oxbow lake, but the transect was shifted downslope due to the aforementioned artificial berm. Prior to shovel testing, five auger tests were excavated along the entire length of the oxbow in order to establish a baseline depth for shovel testing. These five auger tests effectively replaced five shovel tests in that they were excavated at the plotted locations of shovel tests and, likewise, were screened for cultural material. Of the remaining 63 planned shovel tests, 53 were negative and ten were not excavated due to previously mentioned disturbances. Four additional shovel tests were placed judgmentally on the mid-slope of the escarpment in order to investigate the presence of slump observed in selected shovel test profiles (in particular, shovel tests 31-33). These judgmental shovel tests were negative and exhibited heavy mottling, evidence of mass wasting or the slumping of sediment occurring along the bank of the terrace overlooking the oxbow lake. All 5 auger tests and 57 shovel tests were negative for cultural materials; the average depth of excavation for shovel tests was 58.5 cmbs (23 in).

Three auger tests were placed on the northern portion of the terrace mapped as Kimo silty clay loam. Consistent with that soil series, auger tests 2, and 9 revealed an Ap horizon, a mollic epipedon (A1 and A2 horizons) averaging 76 cm (30 in) in thickness, and a series of organic-rich C horizons from fluvial deposition (Figure 6.9). In auger test 4, a buried soil was identified at 220 cm (87 in) bgs in an area mapped as Kimo series. The buried soil is a hard, silty clay loam with carbonates in the A horizon, followed by Bt and Btss horizons. Two additional auger tests (3 and 10) were placed at Area C south of auger tests 2, 4, and 9. These were placed at higher elevation on the Newman terrace tread. Auger tests 3 and 10 revealed a surface soil and buried soil development similar to Area A; a buried soil was encountered at depths of 148 cm (58 in) and 226 cm (89 in) bgs (Figure 6.9).

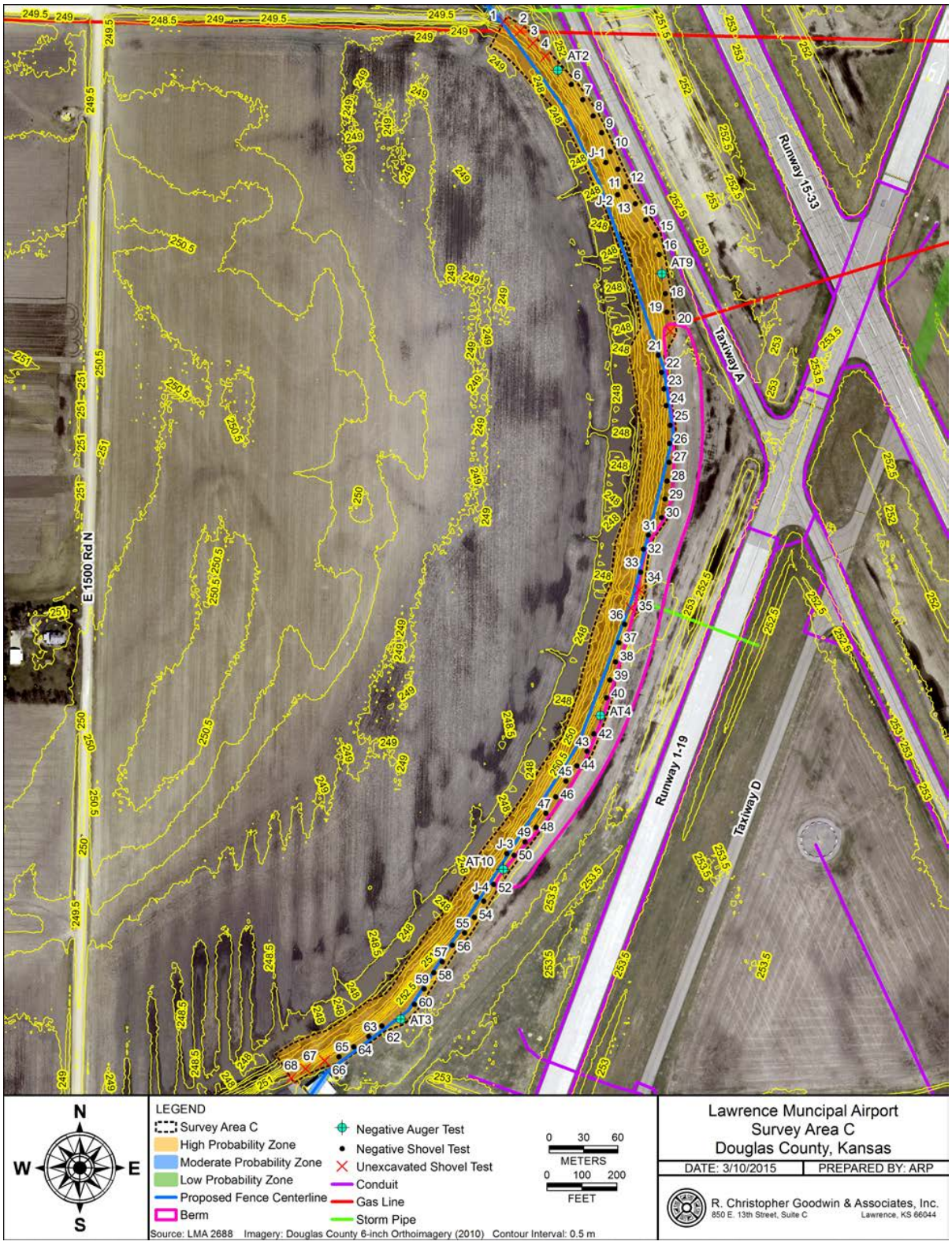

Figure 6.8. Phase II investigations of Area C.

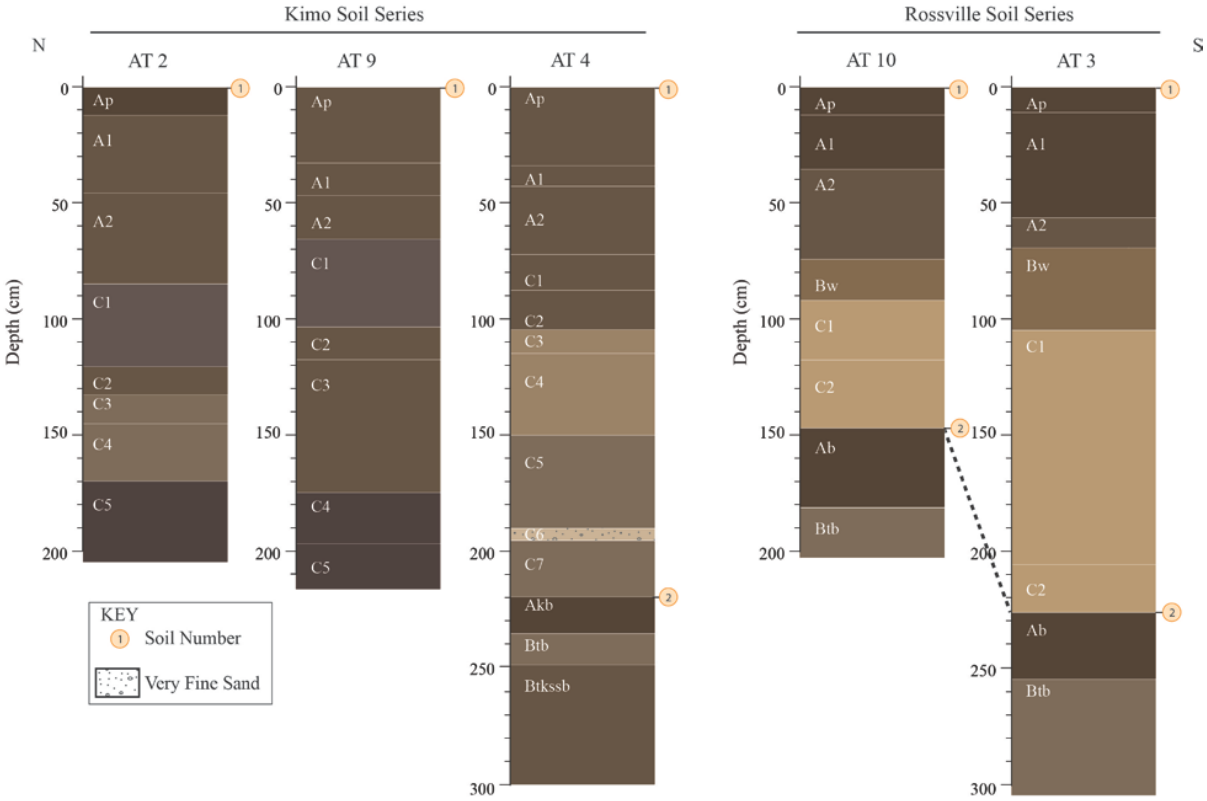

Figure 6.9. Soil stratigraphy from auger tests at Area C (north to south).

In Area C, no further work is recommended prior to perimeter fence installation because the proposed depth of impact on the intact terrace tread is not expected to exceed 61-91 cm (24-36 in) bgs, well above the intercept point for any of the buried soils detected in the Area C auger tests 3, 4, and 10 (Figure 6.9). The mid-slope of the terrace scarp actually is the recommended position for installation of the perimeter fence because the soils and sediments are in secondary slump context, or are derived from recent flood deposits. Either context has low potential for containing in situ archeological material.

Area D

Area D corresponds to 5.14 acres of the southeastern corner of LWC where previously recorded Site 14DO1014 intersects Item 4 (Figure 5.1). Area D straddles property owned by LWC and the KU Endowment Association (KUEA). Permission for RCG&A to conduct fieldwork on KUEA property was coordinated by Mr. Rick Bryant of ADG, with permission granted by Mr. Monte Soukup of KUEA.

14DO1014

Site 14DO1014 is a historic artifact scatter site located in a cultivated field. The artifact scatter is all that remains of a farmstead that once stood at this location. When RCG&A visited the site in January 2015, the field had been harvested of its soybean crop (Figures 6.10 and 6.11). U.S. Hwy 24/40 forms the southern boundary of the site, and E1600 Rd forms the eastern boundary. The north and west boundaries indicate the extent of the artifact scatter as defined through pedestrian survey and shovel testing.

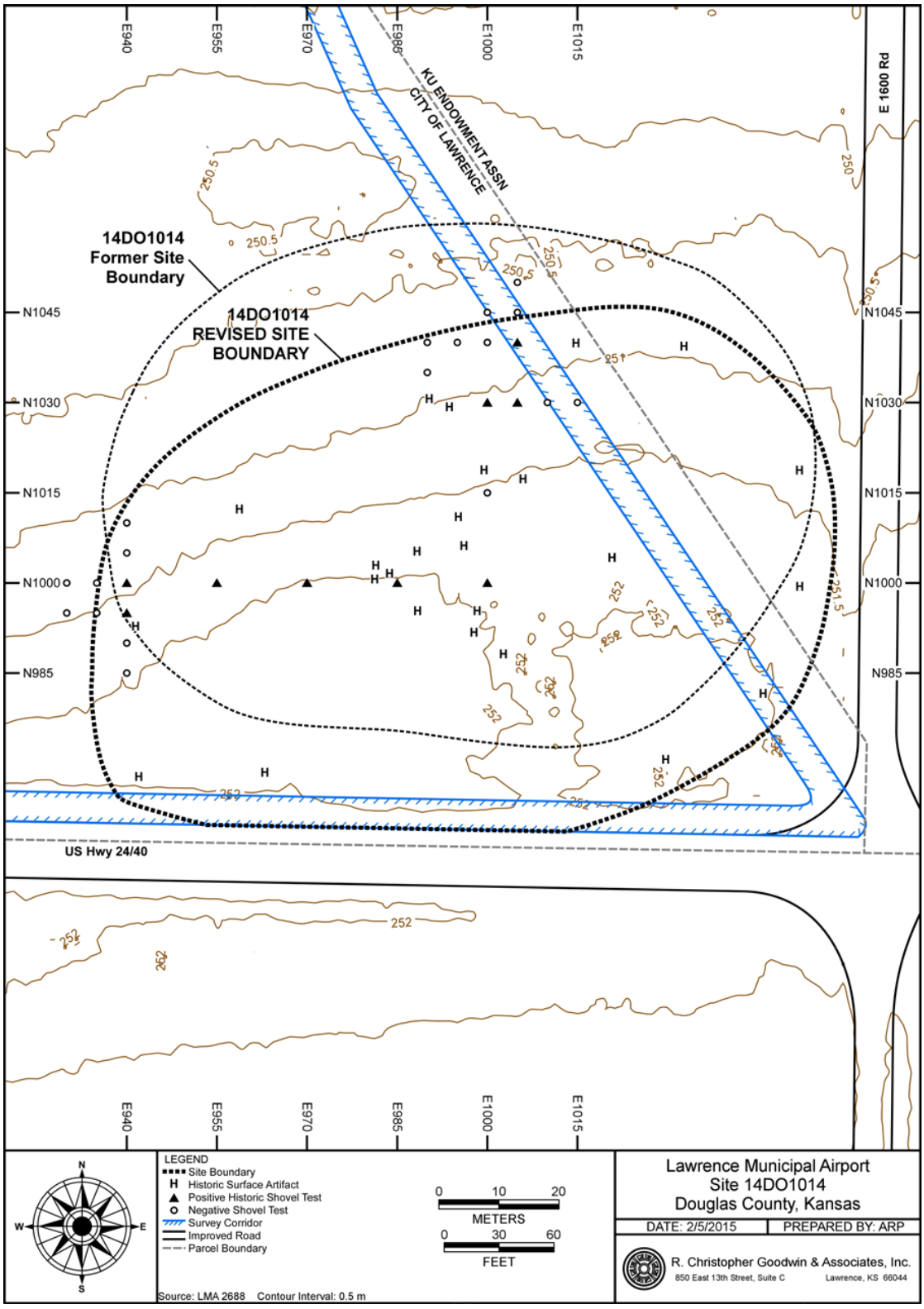

Figure 6.10. Plan map of 14DO1014.

Figure 6.11. Overview of Site 14DO1014 looking west. U.S. Hwy 24/40 is at photo left and the airport terminal complex is visible in the distance.

Previous Research

Site 14DO1014 was recorded in 1996 as a moderately dense concentration of historic surface artifacts with no structural or foundation remains (Ritterbush and Hesse 1996:59). Investigators noted that an 1873 county atlas listed Chas. Robinson as the owner, and it depicted a single structure on the property (F. W. Beers & Co. 1873). The authors' examination of aerial photographs of the property showed that two structures appeared on the property as late as 1978. While no further archeological work was recommended, investigators suggested additional historic research on the property.

Property History

Site 14DO1014 is located in the SE ¼ of the SE ¼ of the SE ¼ of Section 17, T12S, R20E in Grant Township, Douglas County, Kansas. Dr. Charles Lawrence Robinson acquired this property in the mid nineteenth century, perhaps as early as 1861 when he, Robert S. Stevens, and William A. Simpson purchased much of North Lawrence from the Delaware chief, Sarcoxie (Rowe 1952). Sarcoxie had been allotted 720 acres of land in the 1860 Delaware treaty with the United States of which he was a signatory (Kappler 1904; Rowe 1952; Woodlawn Parent Teachers Association 1961:9). By 1873, it is clear that Robinson owns the property in question (F.W. Beers & Co. 1873). In addition to most of Section 17, Robinson owned several other properties in the vicinity and he and his wife lived in a house known as Oakridge, in SE ¼ of Section 8, approximately a mile north of 14DO1014 (Figure 6.12).

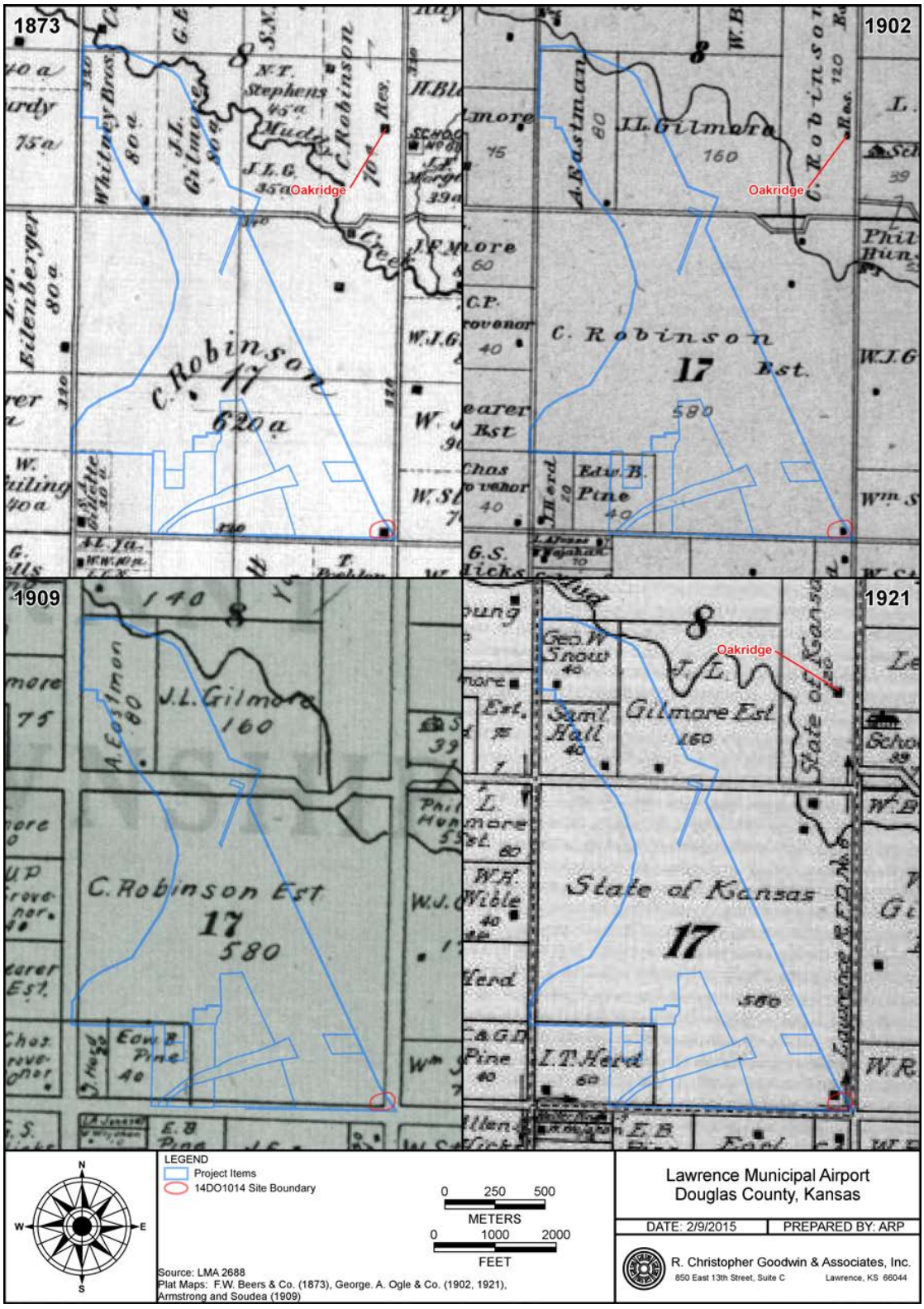

Figure 6.12. The Project boundary, Site 14DO1014, and Oakridge overlain on four historic plat maps (adapted from Armstrong and Soudea 1909; F.W. Beers & Co. 1873; George A. Ogle & Co. 1902, 1921).

After arriving in Kansas Territory in 1854, Charles and Sara lived in the newly-founded City of Lawrence in a home on Mount Oread (Blackmar 1902:292; Corbin 2013). On 21 May 1856, their home was burned during the sack of Lawrence (Griffin 1968; Robinson 1857). Although they rebuilt, their home was threatened again in August 1863 when Quantrill raided the city (Keating 2015). Subsequently, the Robinsons moved to their farm home, Oakridge. As described above, Oakridge was located in the SE ¼ of Section 8 (Figure 6.12). Oakridge and the surrounding land Robinson owned (including Section 17) was willed to KU upon his death. However, his wife, Sara retained a life interest in this property and continued to live at Oakridge until her death in 1911. According to an article written at the time of her death, the Robinson bequest to KU totaled around $200,000 (*Christian Register* 30 November 1911:1249). The Robinsons are buried at Oak Hill Cemetery, Lawrence, Kansas (Figure 6.13).

Figure 6.13. Grave marker of Charles Robinson (1818-1894) and Sarah Tappan Doolittle Robinson (1827-1911) at Oak Hill Cemetery, Lawrence, Kansas.

From Oakridge, the Robinsons managed a significant farming enterprise with several tenants. As a building is depicted at 14DO1014 as early as 1873 (F.W. Beers & Co. 1873), we can conclude this was the location of one of the Robinson's tenant farms at least by that year. Although the nineteenth century leases of this property are unknown, the Hayden family rented it throughout most of the twentieth century.

In 1903, Adrian Kepler Hayden moved with family from Arkansas to Douglas County, Kansas (*Lawrence Journal World* [LJW], 25 September 1975:7; U.S. Census 1900). In the 1905 Kansas Census, the family, consisting of Adrian, his wife Mary, and their five children, is enumerated in Grant Township, presumably living at the location of 14DO1014 (Ancestry.com 2009). Mr. Kent Nunemaker, a descendant of Adrian Hayden, provided support for this conclusion when he visited the RCG&A field crew during their delineation of the site on January 19, 2015. Mr. Nunemaker stated his family had rented the property in question for more than 100 years. In addition to farming, Adrian and his brother Japhan Jupiter Hayden built and operated a blacksmith shop on the corner property in 1907 (Personal Communication, Kent Nunemaker, January 19, 2015). Although Japhan is not enumerated with Adrian's family in 1910 or 1915, he was living with his brother in Grant Township in 1920 (Ancestry.com 2009; U.S. Census 1910, 1920). According to Mr. Nunemaker, a two-story house was constructed on the property in 1911

and a one-story house also was present (construction date unknown). Other structures at this farmstead included a hayshed north of the houses, the blacksmith shop, and a well with an associated windmill (Personal Communication, Kent Nunemaker, January 19, 2015). These buildings and others are visible on aerial imagery from the first half of the twentieth century (Figure 6.14).

RCG&A identified a lease between the property owner, the State of Kansas, and Adrian Hayden for 1918-1923 (Douglas County Courthouse Records [DCCR], Book 102, Page 61). This lease was signed by both Adrian and his son, Willard H. (aka Will). Will Hayden was approximately 25 years old in 1918 and had begun contributing to the family farm. Father and son continued to farm together until Adrian Hayden died in 1942. Adrian is buried at Maple Grove Cemetery just north of the junction of Highways 59 and 24/40, approximately 1.5 miles west of 14DO1014 (Find A Grave 2008). At the time of his death, Mr. Hayden was living in the City of Lawrence; however it appears Will lived on the property in Section 17 into the mid twentieth century. Will Hayden retired from farming around 1960, but a 1965 plat map indicates Will was still living at 14DO1014 (Directory Service Company 1965); however, in 1969, he and his wife moved away (LJW 6 October 1979:7). By the late 1970s when the airport expansion occurred, the farm buildings had all been removed or abandoned (Personal Communication, Kent Nunemaker, January 19, 2015). According to Mr. Nunemaker, the one-story house and windmill were moved in the late 1950s and the two-story house was demolished with the airport expansion. By 1985, aerial photographs show that no structures remained standing at the former farmstead.

As a prominent member of the Oak Ridge neighborhood and Grant Township, Will Hayden served as an elected member of the Douglas County Board of Commissioners for the Second District from 1957-1960 (LJW 22 February 1957:2; LJW 3 November 1960:1). Also during his lifetime he expanded the family farm significantly and included his son-in-law Eugene Wilford Nunemaker in the business (LJW 12 November 1987:3A). Will and his wife Mary are buried at Oak Hill Cemetery in Lawrence (Figure 6.15).

In 1966, the 14DO1014 property was deeded to the KU Endowment from the State of Kansas Board of Regents (DCCR Book 245, Page 96). The Lawrence Municipal Airport underwent an expansion in the late 1970s; as a part of this expansion, the KU Endowment conveyed the majority of the 14DO1014 site area to the City of Lawrence in 1978 (DCCR, Book 325, Page 1486). The property boundary created by this conveyance is extant today (Figure 6.10). The City of Lawrence annexed their portion of the property in 1979 (DCCR Book 332, Page 440); the rest of the property is still owned by the KU Endowment. Although the buildings at 14DO1014 were all demolished by 1985 and ownership of the land has changed, Hayden descendants have continued to farm the land into the twenty-first century (Personal Communication, Kent Nunemaker, January 19, 2015).

Figure 6.14. Historic aerial images showing the location of 14DO1014 through time. Farmstead structures are visible in the 1937, 1948, and 1967 images; by 1985, the former farmstead was an agricultural field.

Figure 6.15. Grave marker of Mary R. Hayden (1899-1995) and Will H. Hayden (1893-1987) at Oak Hill Cemetery, Lawrence, Kansas.

Current Investigation

Historic cartographic research revealed a single structure was depicted on the property in the 1873 and 1902 plat atlases (F.W. Beers & Co. 1873; George A. Ogle & Co. 1902). The 1909 plat (Armstrong and Soudea 1909) does not show a structure on the property; however, several buildings depicted on earlier and later maps are not depicted on this map so it is not considered a reliable resource. Structures, two this time, are depicted at 14DO1014 on a 1921 plat by George A. Ogle & Co. (Figure 6.12). The 1948 aerial photograph shows at least six structures (Figure 6.14). By 1967, several of the structures had been removed, and portions of the property have been converted to an agricultural field. Mr. Nunemaker reported the last building at the site was demolished in the late 1970s and aerial photograph shows the entire property had been converted to an agricultural field by 1985.

When RCG&A visited the site on 19-20 January 2015, the archeologists first conducted a pedestrian survey across the previously recorded site area at 5-m transect spacing. The crew reported 50 percent gsv throughout the site area. A moderately dense scatter of 208 historic surface artifacts was observed; no features are present at the site. All observed surface artifacts were flagged during survey and the outermost artifacts were piece-plotted to document the surface extent of the scatter. Diagnostic artifacts also were piece-plotted to maintain spatial control over temporally sensitive data. Piece-plotted artifacts are mapped on Figure 6.10. The remaining surface artifacts were tallied by artifact class and type.

Shovel tests were excavated to assist in the delineation of the north and west site boundaries and to characterize the subsurface cultural deposits. Transects were extended from the center of the surface scatter along one transect northward and one transect westward. No shovel tests were excavated to the east or south, since roads define those boundaries of the site. Shovel tests were laid out at 15 m intervals and selected positive tests were delineated at 5 m intervals until excavators encountered two consecutive negative shovel tests. RCG&A excavated 27 shovel tests at 14DO1014. Nine of the shovel tests were positive for historic cultural material, yielding 77 artifacts encountered at depths of 0-20 cm (0-7.9 in) bgs. The typical soil profile consisted of two strata. Stratum I

(0-25/30 cmbs; 0-9.8/11.8 in) consisted of the plow zone, a very dark grayish brown (10YR 3/2) silt loam. Stratum II (25/30 – 35/40 cmbs; 0-9.8/11.8 – 13.8/15.7 in) consisted of brown (10YR 4/4) silt loam.

Using the extent of the surface scatter and positive shovel tests, RCG&A revised the site boundary. The revised site boundary is essentially the same size and shape as the original, but it plots slightly southward. Such locational variation in the site boundary is expected in an agricultural field under active cultivation. The 14DO1014 surface and subsurface artifact assemblage is indicative of a variety of domestic activities taking place there during the first half of the twentieth century. A domestic artifact assemblage is consistent with historic research and information provided by an informant, Mr. Kent Nunemaker, who reported that this site was a working farmstead from the late nineteenth to mid twentieth centuries.

As per the scope of work, the field crew documented archeological finds on-site but did not collect any artifacts. RCG&A crew recorded 285 artifacts at 14DO1014. The majority of those (n=208) were observed on the surface; 77 were noted in shovel tests. The artifact assemblage was dominated by glass (62 percent), with lesser quantities of ceramics (20 percent), metal (8 percent), building materials (5 percent), and other materials (5 percent). The glass sub-assemblage consisted of both container and window shards and two marbles. Shards from bottles and jars of amber, aqua, cobalt, colorless, blue and green milk, and solarized amethyst glass were all identified. Whiteware dominated the ceramic subassemblage, but stoneware, ironstone and porcelain domestic ceramic sherds also were recorded. Two fragments of industrial porcelain were observed. The metal items included cast iron drain pipe fragments and a tin can fragment. Iron alloy metal artifacts included a bar, a buckle, and several unidentified fragments. The building materials category included bricks, bricks with mortar adhering, concrete, and a piece of paving tile. Finally, the other materials included fragments of coal and charcoal and one burned bone fragment. Diagnostic qualities such as ceramic glazes and slips as well as glass colors, mold seams, and markings were recorded to help determine a range of depositional dates. These diagnostic materials suggest an occupation date range from the late nineteenth to mid twentieth centuries (Table 6.1).

Table 6.1. Diagnostic artifacts from 14DO1014 indicate a date range of the nineteenth to mid twentieth centuries.

Diagnostic Artifact Description	Date Range (for general artifact types)	Reference
Stoneware with Bristol slip	1870s-1950s	Miller 2000
Stoneware with Albany slip	1805-1930s	Miller 2000
Porcelain with flow blue underglaze transfer print, cf. Gaston 1983:139	late 1800s-1930	Gaston 1983:139
Solarized amethyst/amethystine glass	1880-1930s	Lindsey 2015
Aqua glass	early 1800s-ca. 1920	Lindsey 2015
Machine-made cup-bottom mold	1880s-1920 (non-automatic machines)	Lindsey 2015
Glass bottles with "ghost" seams	post-1905	Lindsey 2015
Glass bottles with Owens scar	1905-1982	Lindsey 2015
Mason jar lightning closures	1910-1960s	Lindsey 2015
Milk glass lid liners for jars	1869-1950s	Lindsey 2015
Glass bottles with Hazel-Atlas maker's mark	1924-1964	Lindsey 2015
Cut nails	1820s-1930s	Adams 2002
.22 cal. rimfire casing with "U" headstamp	1885-present	Steinhauer 2015

Recommendations

Site 14DO1014 was evaluated applying the National Register criteria for evaluation (36 CFR 60.4 [a-d]). It is a historic farmstead site that appears to have been occupied from the mid nineteenth to mid twentieth centuries. There is no evidence that the property is eligible for its association with events significant to local, state, or national history (Criterion A).

The property where 14DO1014 is located was owned by Dr. Charles Robinson, an individual of local and state significance from his arrival in Kansas Territory in 1854 until his death in 1894. Robinson's significance is associated with the historic contexts of Territorial and Early Kansas Statehood, the Border Wars, and Bleeding

Kansas. Locally, Robinson played important roles in the founding and early history of the City of Lawrence and KU. Although he and his wife owned the property at 14DO1014 for approximately 50 years, they did not occupy that site. Instead, they lived in Lawrence and later at Oakridge, north of 14DO1014 (Figure 6.12). Robinson's association with the farm at 14DO1014 was one of landlord. During the twentieth century, the Hayden family occupied this site for more than 60 years. Arian K. Hayden brought his family to this location in 1903 and lived there until he died in 1942. Will Hayden, who came to 14DO1014 as a boy, lived on the property until 1969. A Grant Township farmer, Will Hayden served on the Douglas County Board of Commissioners from 1957-1960. Apparently the site was abandoned in 1969 and the last of the structures was demolished in the late 1970s. Site 14DO1014 is not intricately associated with the lives of persons significant in our past (Criterion B).

No extant structures are present at 14DO1014, and historic aerial images of the farmstead do not suggest that the site configuration was distinctive (Criterion C). While archeological testing yielded subsurface deposits, cultural materials were confined to the plow zone, and no intact archeological features were encountered. Extensive agricultural activity and razing of the former buildings has destroyed the integrity of the site. Thus, the site did not yield, nor is it likely to yield, information important to history or prehistory (Criterion D). Therefore, 14DO1014 does not possess those qualities of significance and integrity as defined by the National Register criteria for evaluation (36 CFR 60.4 [a-d]).

Site 14DO1014 is 8,820.9 m^2 in area. Assuming a 15-m wide installation APE, the perimeter fence (Item 4) will impact a maximum of 833.5 m^2, or about 9.4 percent of the total site area. The linear impact to the site is roughly 167 m (548 ft). Site 14DO1014 is not an historic property, and no further work is recommended.

Chapter 7
SUMMARY AND RECOMMENDATIONS

This study addresses a recommendation by the Kansas SHPO for an archeological survey of high and/or moderate potential areas that may be affected by proposed improvements at LWC in Douglas County, Kansas. Should the proposed capital improvements be funded by grants from the FAA to the City of Lawrence, these improvements will qualify as undertakings subject to compliance with Section 106 of the NHPA, and 36 CFR 800.

From 19-23 January 2015, RCG&A surveyed 75.65 ac of high and moderate archeological sensitivity within four survey areas (Areas A, B, C, and D) at the LWC. Of eight project items, Items 1, 2, 3, 4, and 8 were targeted for investigation. Items 5 and 6 involve rehabilitation of existing concrete infrastructure, and therefore were excluded from the archeological scope of work. Item 7, a proposed extension of Taxiway D, also was excluded from the Phase II archeological investigation after utility locates, field reconnaissance, and a review of historic aerial imagery revealed evidence of extensive ground-disturbances within the proposed depth of impact 46 cm (~18 in) bgs.

Area A encompassed Items 1, 2, 3, and 8. Item 1 is a pre-design drainage study. Items 2, 3, and 8 will include grading and other construction-related ground disturbances to a maximum anticipated depth of impact to 24-36 inches (61-91 cm) bgs. Archeological investigations in Area A consisted of intensive pedestrian survey across the portions classified as moderate probability, and pedestrian survey plus 256 negative shovel tests excavated across the high probability zones to an average depth of 24 inches (61 cm) bgs. Although RCG&A encountered no evidence that the surficial boundary of an adjacent prehistoric archeological site (14DO1020) extends eastward onto LWC property, geoarcheological evidence suggests that 14DO1020 actually is associated with a buried soil that does extend eastward onto LWC property. To the west of Airport Road, where the Newman terrace is intact (i.e., classified as high sensitivity), the top of that buried soil (Soil 2) was detected in three of five auger tests at about 81-85 inches (205-218 cm) bgs. The auger tests excavated in Area A revealed that the buried soil is restricted in distribution to the west of Airport Road, and it is too deep to be affected by the activities planned for Items 2, 3, and 8. However, proposed drainage improvements planned have the potential to intersect the buried soil and any associated archeological content.

Therefore, in that portion of Area A located west of Airport Road and north of the existing drainage channel, additional deep testing is recommended for any drainage improvements that exceed a threshold of ~165 cm (65 in) bgs. The results of two additional auger tests demonstrate that an entirely different soil-stratigraphic sequence is present in Area A to the east of Airport Road. RCG&A strongly recommends siting drainage improvements and other deep excavations on the east side of Airport Road because no further deep testing is recommended for that area.

For Item 4, Area B corresponds to the moderate sensitivity zones of the proposed perimeter fence, and Areas C and D are associated with high sensitivity zones. No archeological sites were identified during the pedestrian survey of Area B, which mostly corresponded to open agricultural fields, or during intensive subsurface shovel and auger testing of Area C. Area C spans the terrace scarp along the edge of an ancient oxbow channel. In three of the five auger tests excavated in Area C, a buried soil was detected at depths of 148, 206, and 220 cm (58, 87, and 89 in) bgs. RCG&A excavated 57 shovel tests along the terrace tread, a narrow strip of intact terrace between the terrace scarp and an artificial berm that spans much of Area C. The shovel test results confirm that the mid-slope sediments are composed mainly of secondary slumpage or flood deposits. In Area C, RCG&A recommends installing the perimeter fence along the mid-slope of the terrace scarp to eliminate impacts to intact terrace sediments, including buried soils with high potential for associated archeological content.

In Area D, previously recorded historic archeological site 14DO1014 was relocated, and subjected to intensive shovel testing, surface artifact recordation, and archival research to assess its significance under National Register Criterion B. Site 14DO1014 will be impacted by the excavation of post holes 61-91 cm (24-36 inches) in

depth for the installation of support posts for Item 4, the proposed perimeter fence. Based on the results of the site revisit and archival research, 14DO1014 is recommended not eligible for the National Register of Historic Places (36 CFR 60.4[a-d]). Site 14DO1014 is not a historic property; no further work is recommended.

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APPENDICES

Appendix A: Project Correspondence

Appendix B: Auger Test Descriptions

Appendix C: 14DO1014 Archeological Site Form Update

APPENDIX A

PROJECT CORRESPONDENCE

AIRPORT
DEVELOPMENT
GROUP INC.

August 13, 2014

Ms. Kim Gant
State Historic Preservation Office
Historic Preservation; Review and Compliance Coordinator
Kansas Historical Society
6425 SW 6th Avenue
Topeka, Kansas 66615-1099

Subject: Lawrence Municipal Airport, City of Lawrence, Kansas
FAA AIP Project No. 03-20-0047-17-2014
Request for Comment; Environmental Assessment

Dear Ms. Gant:

The City of Lawrence and the Lawrence Municipal Airport has initiated a National Environmental Policy Act (NEPA) Environmental Assessment (EA) process for the following proposed federal actions:

- Perform drainage study on a portion of the airport (±120 acres)
- Construct T-hangar and access taxiways (±11,650 square yards)
- Prepare (grade and disturb) area for planned landside development (±50 acres)
- Construct perimeter fencing (±29,500 linear feet)
- Rehabilitate general aviation apron (±32,350 square yards)
- Rehabilitate (and strengthen as a consequence) Runway 15-33 (±63,333 square yards)
- Extend Taxiway D to full parallel (±4,950 square yards)
- Construct Phase I (±16,500) and II (±23,400 square yards) GA Aprons

The Lawrence Municipal Airport is listed in the FAA's National Plan of Integrated Airport Systems (NPIAS) as a general aviation airport. The airport site comprises approximately 500 acres of fee simple property ownership, situated within Section 17, Township 12 South, and Range 20 East. The Lawrence Municipal Airport is located approximately 2 miles north of the City of Lawrence. This airport accommodates general aviation and military aircraft.

Enclosed you will find airport layout figures (USGS topo and Aerial) depicting the proposed federal actions. The proposed improvements are shown in color and are tabulated below the drawing view. The proposed federal actions are depicted on the approved Airport Layout Plan, envisioned comply with FAA grant assurances, and to provide for the safety of flight operations and demand accommodation in compliance with FAA guidance.

The drainage study (Improvement No. 1) is a study only with no on-the-ground impacts. T-hangars (Improvement No. 2) are aircraft storage facilities with the necessary access pavements. The lightly-shaded brown cross-hatched area (Improvement No. 3) indicates an area of potential disturbance for future aviation-related tenant occupation. Occupation in this instance perhaps includes fill to level

3900 Lakeland Drive • Suite 501C
Jackson, Mississippi 39232
601.932.6920 • 601.932.6901 fax
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the ground for future large (i.e. 100 feet by 100 feet) hangars/buildings, auto access and parking and/or aircraft parking area; the scope and nature of tenant improvements are currently not known. A combination of wildlife fencing and perhaps chain-link nearer to aviation facilities (Improvement No. 4) is envisioned for fencing. Rehabilitation of both the general aviation apron (Improvement No. 5) and Runway 15-33 (Improvement No. 6) are in-place reconstruction of asphalt pavements. Extension of Taxiway D (Improvement No. 7) to full-parallel envisioned is to discourage aircraft back-taxi movements. Finally, new phased-development apron (Improvement No. 8) is envisioned to accommodate potential demand.

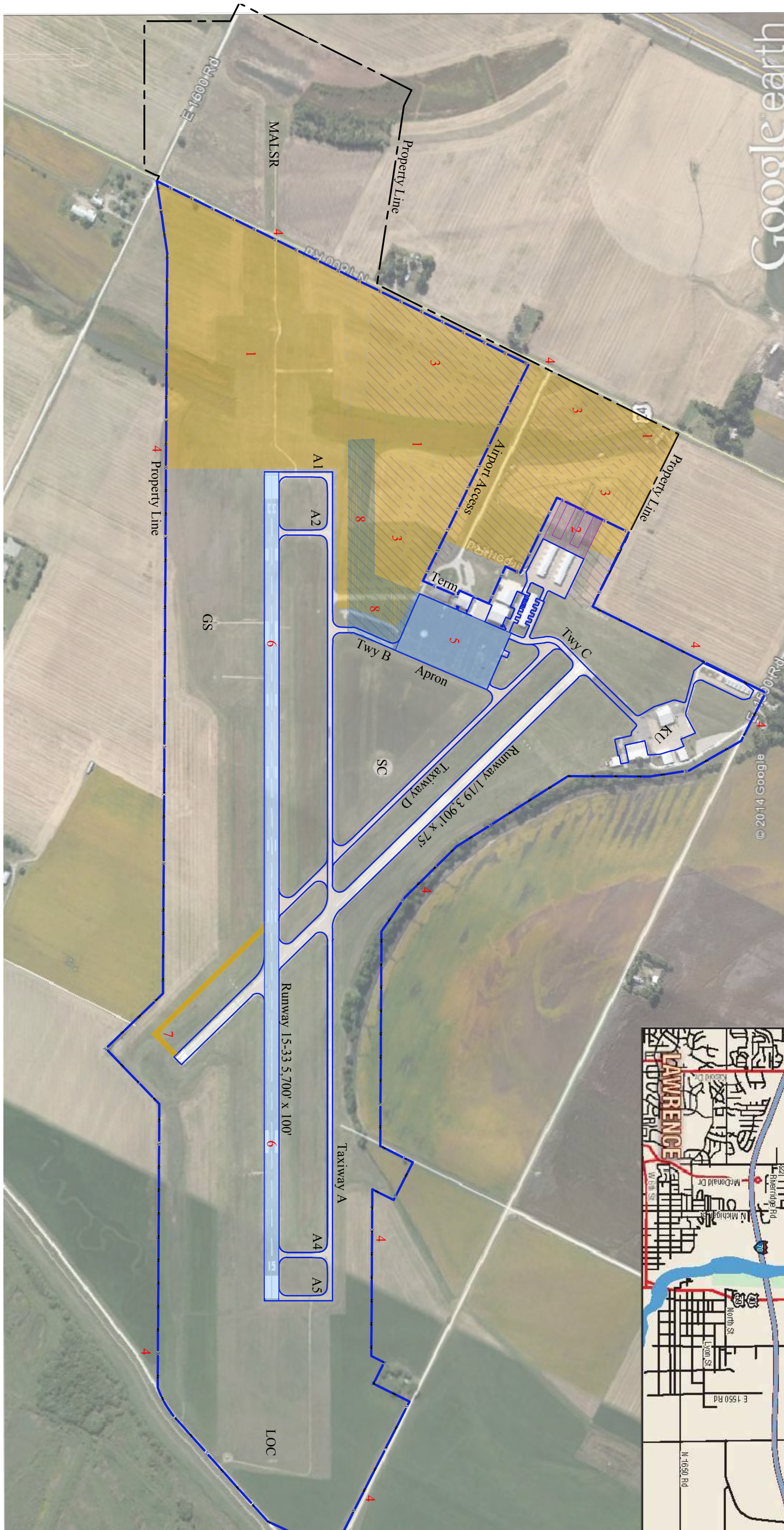
Based upon early potential subcontractor coordination two recorded sites were noted 14DO1014 and 14DO1020 within the select proposed federal action impact areas. The existence of any resources may be confirmed by a formal investigation should FAA as lead agency see fit.

We are evaluating environmental issues concerning these proposed federal actions. Please consider this our formal request for you to identify any environmental issues which may be of importance to the proposed federal actions. We respectfully request your comments within thirty (30) days following your receipt of this correspondence. Your comments are important for this process and will be appended to the Draft and Final EA documents. If you have questions or require further information regarding this request, please contact me at (601) 932-6920 or at gbehrens@adgairports.com.

Sincerely,

Gary K. Behrens
Airport Environmental Specialist

Enclosures



Planned Improvements

Number	Project
1	Perform Drainage Study on a Portion of the Airport (±120 Ac)
2	Construct T-Hangars and Access Taxiways (±11,650 sqyds)
3	Prepare (Grade and Disturb) Area for Planned Development (±50 Ac)
4	Construct Perimeter Fence (±29,500 lf)
5	Rehabilitate General Aviation Apron (±32,350 sqyds)
6	Rehabilitate (and Strengthen) Runway 15-33 (±63,333 sqyds)
7	Extend Taxiway D to Full-Parallel (±4,950 sqyds)
8	Construct Phase I (±16,500 sqyds) and II (±23,400 sqyds) GA Aprons

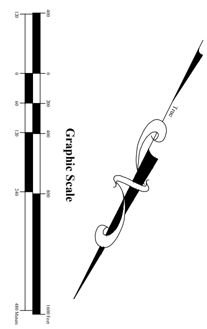


Exhibit:	I of II Exhibits

Environmental Assesssment Projects; Purpose/Need Aerial Backgroud

Project No.:	LWC
Designed By:	JES
Drawn By:	SPM
Approved By:	DPH
Date:	March 2014

ADG AIRPORT DEVELOPMENT GROUP INC.
1776 South Jackson Street / Suite 950
Denver, Colorado 80210-3802
303.782.0882 / 303.782.0842 fax
www.ADGAirports.com

AIP Project No. 03-20-0047-17-2014 (EA)

Lawrence Municipal Airport
Lawrence, Kansas

No.	Revision	Ckd	Date

6425 SW 6th Avenue
Topeka, KS 66615

phone: 785-272-8681
fax: 785-272-8682
email@kshs.org

Kansas Historical Society

Sam Brownback, Governor
Jennie Chinn, Executive Director

KSR&C No. 14-08-144

August 20, 2014

Gary K. Behrens
Airport Environmental Specialist
Airport Development Group Inc.
3900 Lakeland Drive, Suite 501C
Jackson, MS 39232

Via E-Mail

RE: Lawrence Municipal Airport Improvements
FAA AIP Project No. 03-20-0047-17-2014
Douglas County

Dear Mr. Behrens:

In accordance with 36 CFR 800, the Kansas State Historic Preservation Office has reviewed your letter dated August 13, 2014, describing plans for the above-referenced project. Prior to beginning construction, a professional archeologist should survey portions of the project area as they are situated in a locality of high and/or moderate archeological potential. Our concern is that (as you noted) recorded archeological sites are situated within the proposed project as well as nearby along the Kansas River and its tributaries in similar topographic settings. Specifically, survey should be conducted in the proposed development areas (including the drainage study locality) south of the airport along with the proposed Taxiway D extension.

Any archeologist meeting the Minimum Professional Qualifications of this office as outlined in *The State Historic Preservation Officer's Guide For Archeological Survey, Assessment, and Reports* (SHPO's Guide), is eligible to perform the requested work. A list of archeological contractors meeting these standards is available from our web site at: http://www.kshs.org/p/archeological-consultants/14593.

We note that your firm is preparing an environmental assessment in compliance with the National Environmental Policy Act (NEPA). While we are always willing to respond, our office has no role in the NEPA process. We are contacted as part of consultation mandated in Section 106 of the National Historic Preservation Act. The Section 106 regulations require that a project's lead federal agency, presumably the Federal Aviation Administration (FAA) in this case, notify not only our office but also any Indian tribes that may have interest in the area. A list of tribes, arranged by county, may be found on our agency's web site at: http://www.kshs.org/p/tribes-with-potential-consultation-interests-in-kansas/14611.

This information is provided at your request to assist you in identifying historic properties, as specified in 36 CFR 800 for Section 106 consultation procedures. If you have questions or need additional information regarding these comments, please contact Tim Weston at 785-272-8681 (ext. 214) or Kim Gant at 785-272-8681 ext. 225. Please refer to the Kansas Review & Compliance number (KSR&C#) above on all future correspondence relating to this project.

Sincerely,

Jennie Chinn
Executive Director and
State Historic Preservation Officer

Patrick Zollner
Deputy State Historic Preservation Officer

AIRPORT
DEVELOPMENT
GROUP INC.

ADG

September 26, 2014

Ms. Kim Gant
State Historic Preservation Office
Historic Preservation; Review and Compliance Coordinator
Kansas Historical Society
6425 SW 6th Avenue
Topeka, Kansas 66615-1099

Subject: Lawrence Municipal Airport, City of Lawrence, Douglas County, Kansas
FAA AIP Project No. 03-20-0047-17-2014
Follow-up Request for Comment; Environmental Assessment

VIA EMAIL: tweston@kshs.org

Dear Ms. Gant:

This letter follows on from ADG's August 13 letter, and SHPO's August 20 response on the subject. SHPO's August 20 letter recommended investigation not limited to the 'drainage study locality'. ADG gathers this to mean the entire area depicted on the attachments in previous correspondence as Purpose and Need (P&N) Items No. 1, approximating ±120 acres.

Since receipt of SHPO's August 20 letter, preliminary investigation has be completed into the nature and extent of drainage improvements for EA purposes. Three study options have been developed, as attached, which serve to substantiate an extent of disturbance for drainage improvements, regardless of option. The City will be considering the options; and, I find that the limits of P&N Item No. 1 have decreased in size. ADG has updated our P&N drawing, as attached, to reflect the current situation, namely ±42 as opposed to ±120 acres.

If you wish to provide additional or other comments pursuant to this modification, please contact me at (303) 782-0882 or at smarshall@adgairports.com. Either Gary or I are happy to discuss any aspect of this with you.

Sincerely,

Steve Marshall
Planning Project Manager

Enclosures (**Email**)

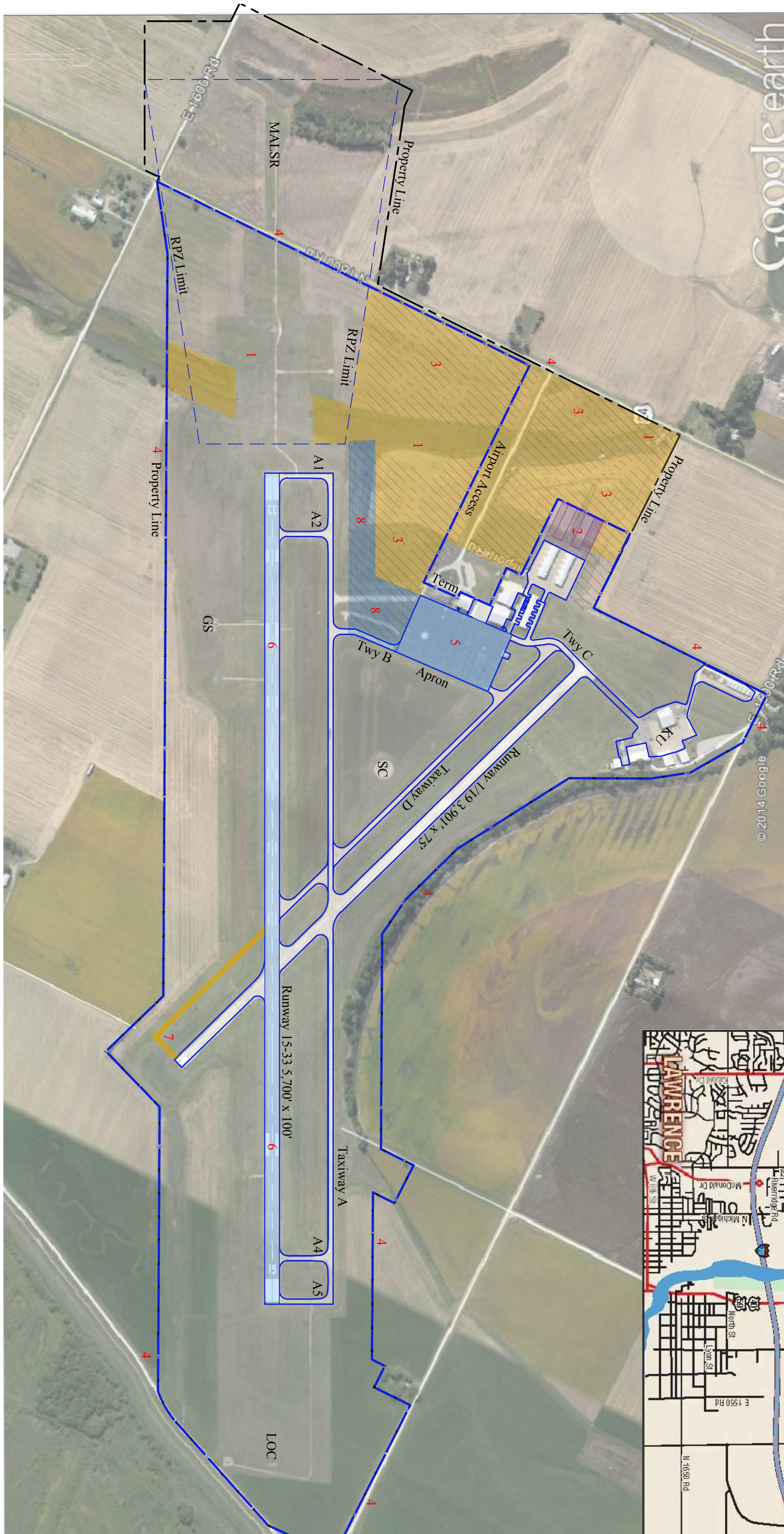
1776 South Jackson Street • Suite 950
Denver, Colorado 80210-3808

303.782.0882 • 303.782.0842 fax
www.ADGAirports.com

Denver, CO • Jackson, MS • Lawrence, KS • Salt Lake City, UT

Planned Improvements

Number	Project
1	Perform Drainage Study on a Portion of the Airport (±67 Ac)
2	Construct T-Hangars and Access Taxiways (±11,650 sqyds)
3	Prepare (Grade and Disturb) Area for Planned Development (±50 Ac)
4	Construct Perimeter Fence (±29,500 lf)
5	Rehabilitate General Aviation Apron (±32,350 sqyds)
6	Rehabilitate (and Strengthen) Runway 15-33 (±63,333 sqyds)
7	Extend Taxiway D to Full-Parallel (±4,950 sqyds)
8	Construct Phase I (±16,500 sqyds) and II (±23,400 sqyds) GA Aprons



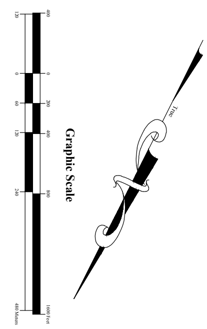


Exhibit: I of II Exhibits

Environmental Assesssment Projects; Purpose/Need Aerial Backgroud

Project No.:	LWC
Designed By:	JES
Drawn By:	SPM
Approved By:	DPH
Date:	March 2014

ADG AIRPORT DEVELOPMENT GROUP INC.
1776 South Jackson Street / Suite 950
Denver, Colorado 80210-3802
303.782.0882 / 303.782.0842 fax
www.ADGAirports.com

AIP Project No. 03-20-0047-17-2014 (EA)

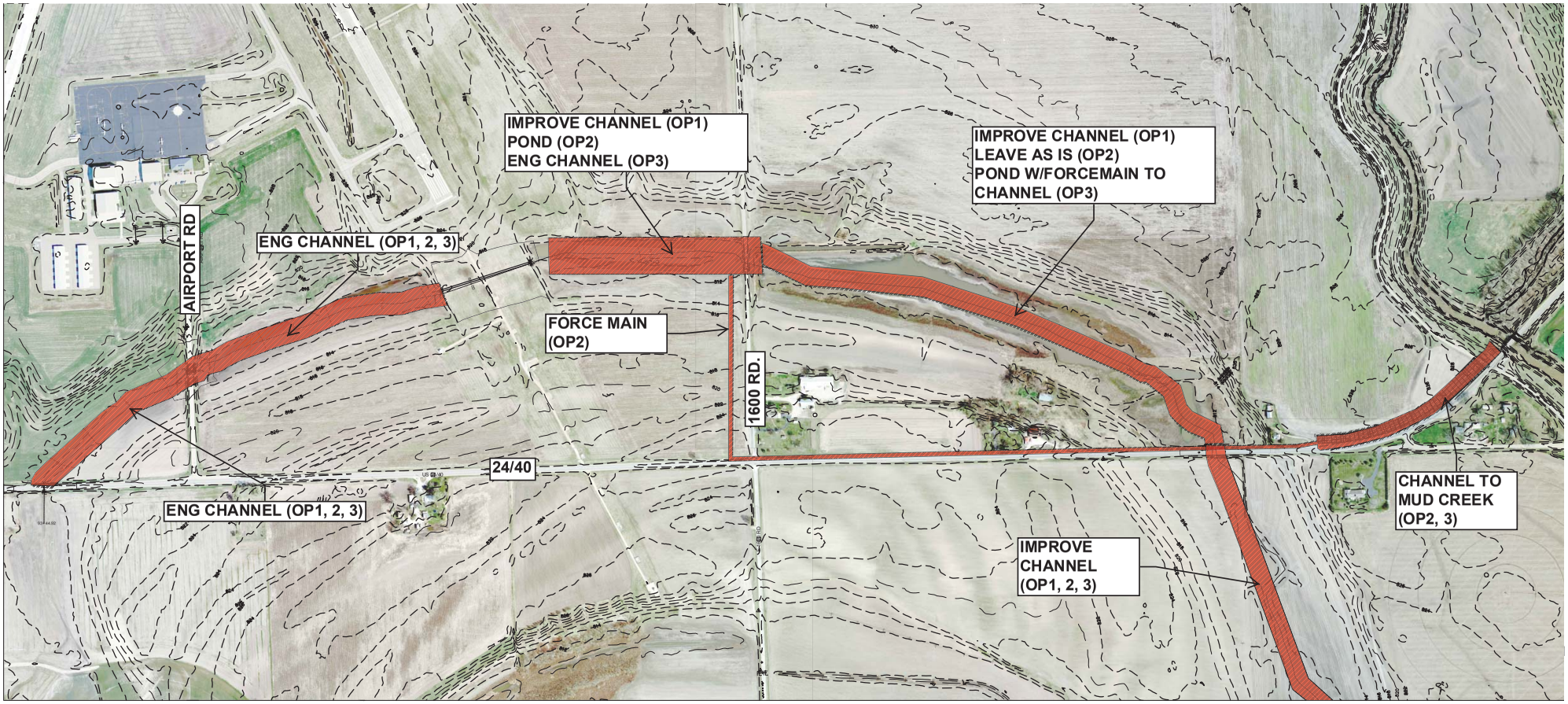
Lawrence Municipal Airport
Lawrence, Kansas

No.	Revision	Ckd	Date

OPTION 1
AREA = 22 AC

OPTION 2
AREA = 20 AC

OPTION 3
AREA = 24 AC



APPENDIX B
AUGER TEST PROFILES

Auger Test 1 (Area A)

Soil No.	Depth (cm)	Horizon	Description
1	0-16	Ap	Very dark brown (10YR 2/2, dry) silt loam to silty clay loam; platy structure, parting to granular; common very fine pores; few very fine roots; friable.
	16-47	A1	Very dark brown (10YR 2/2, dry) mottled with dark grayish brown (10YR 4/2, dry) silt loam; platy structure, parting to granular; common to many coarse mottles of sandy loam; friable.
	47-85	A2	Very dark grayish brown (10YR 3/2, dry) mottled with (10YR 3/3, dry) dark brown silt loam; weak to moderate subangular blocky structure; common very fine, fine, and medium dendritic tubular pores, many very fine and fine vesicular pores; common fine roots; mottling in root channels; friable.
	85-98	Bw1	Very dark grayish brown (10YR 3/2, dry) silt loam; weak to moderate medium subangular blocky structure; common discontinuous distinct clay films on ped faces; common very fine and fine dendritic tubular pores, many fine vesicular pores; friable.
	98-121	Bw2	Dark grayish brown (10YR 4/2, dry) mottled with 50% very dark grayish brown (10YR 3/2, dry) silty clay loam; moderate fine subangular blocky structure; many discontinuous distinct clay films on ped faces; common coarse vesicular pores; friable.
	121-168	C1	Pale brown (10YR 6/3, dry) silt loam; massive structure, parting to single grain; few medium roots; loose.
	168-206	C2	Pale brown (10YR 6/3, dry) mottled with dark grayish brown (10YR 4/2, dry) silty clay loam; massive structure, parting to single grain with clay pick-up; very friable.
2	206-235	Ab	Very dark brown (10YR 2/2) silty clay loam; moderate medium subangular blocky structure, parting to moderate to strong medium granular; common very fine to fine vesicular pores; few very fine to fine redoximorphic concentrations in vesicular pores; common very fine roots; friable.
	235-267	ABb	Very dark brown (10YR 2/2, dry) mottled with black (10YR 2/1, dry) silty clay loam; moderate subangular blocky structure; common fine and medium vesicular pores; common very fine roots; common medium to coarse mottles; hard.
	257-303	Bt1b	Dark grayish brown (10YR 4/2, dry) mottled with very dark grayish brown (10YR 3/2, dry) silty clay loam to clay loam; weak medium subangular blocky structure; many prominent clay films; common fine and medium mangenese nodules in pores; hard common fine to medium reddish yellow (7.5YR 6/8) redoximorphic concentrations on ped faces at 275-290 cmbs.
	303+	Bt2b	Dark grayish brown (10YR 4/2, dry) mottled with very dark grayish brown (10YR 3/2, dry) silty clay loam to clay loam; weak medium subangular blocky structure; prominent mottles and staining; common reddish yellow (7.5YR 6/8) redoximorphic concentrations on ped faces.

Soil Mapping Unit: Rossville Soil Series

Geomorphology: Cultivated field on the surface of the Newman terrace south of the LWC, west of Aiport Road.

Auger Test 2 (Area C)

Soil No.	Depth (cm)	Horizon	Description
1	0-21	Ap	Very dark brown (10YR 2/2, dry) silty clay loam; moderate platy, parting to coarse granular structure; many very fine vesicular pores; many very fine and fine roots, few medium to coarse roots; few very fine redoximorphic concentrations in vesicular pores; friable.
	21-48	A1	Very dark grayish brown (10YR 3/2, dry) silt loam; weak medium subangular block structure parting to granular structure; few fine and coarse roots. Possible chert nodule or road gravel at 40-48cmbs; friable.
	48-84	A2	Very dark grayish brown (10YR 3/2, dry) silt loam to silty clay loam, weak medium subangular blocky structure parting to granular structure; few fine to medium vesicular pores; few coarse roots; friable.
	84-120	C1	Very dark gray (7.5YR 3/1, dry) silt loam; weak medium prismatic parting to weak fine subangular blocky structure; very few very fine to fine dendritic tubular pores; very few medium roots; hard.
	120-132	C2	Very dark grayish brown (10YR 3/2, dry) silty clay loam; moderate subangular blocky structure; common to many very fine roots; continuous prominent yellowish red (10YR 5/8) redoximorphic concentrations on ped faces; hard.
	132-147	C3	Dark grayish brown (10YR 4/2, dry) mottled with dark brown (7.5YR 3/2, dry) silty clay loam; moderate subangular blocky structure; prominent strong brown (7.5YR 5/8) redoximorphic concentrations on ped faces; few gravels, few pebbles; hard.
	147-180	C4	Dark grayish brown (10YR 4/2, dry) mottled with dark brown (7.5YR 3/2, dry) silty clay loam; weak fine subangular blocky stucture; prominent strong brown (7.5YR 5/8) redoximorphic concentrations on ped faces; few medium roots; few gravels; hard.
	180-205	C5	Black (7.5YR 2/1) silty clay to clay with brown (7.5YR 4/3) very fine sand lenses; coarse angular blocky structure; many medium to coarse dendritic tubular pores, few coarse vesicular pores; few to common fine roots, common very fine roots; distinct clay films on ped faces; hard. Organic-rich flood drape?

Soil Mapping Unit: Kimo Soil Series

Geomorphology: Grass covered meander scar adjacent to oxbow, floodplain tread; perhaps some disturbance from airport activity?

Auger Test 3 (Area C)

Soil No.	Depth (cm)	Horizon	Description
1	0-11	Ap	common very fine and fine and few coarse roots; common to many fine dendritic tubular pores; few pebbles and gravels; friable.
	11-56	A1	Very dark brown (10YR 2/2, dry) silt loam; weak fine to medium subangular blocky structure; common very fine and fine and few coarse roots; common to many fine dendritic tubular pores; friable.
	56-70	A2	weak to moderate subangular blocky structure; few very fine, fine, medium, and coarse roots, common dendritic tubular pores; very fine strong brown (7.5 4/6, dry) redoximorphic concentrations in dendritic tubular pores; sticky; friable.
	70-105	Bw	Brown (10YR 4/3, dry) mottled (20%) with very dark grayish brown (10YR 3/2, dry); weak medium subangular blocky structure; common very fine and fine dendritic tubular pores; few very fine redoximorphic concentrations in dendritic tubular pores; sticky; friable.
	105-208	C1	Pale brown (10YR 6/3, dry) silt loam; massive structure, parting to single grain; homogenous but increasing in sand with depth; very friable to loose.
	208-226	C2	Pale brown (10YR 6/3, dry) mottled (20%) with dark grayish brown (10YR 4/2, dry) silty clay loam; weak fine subangular blocky parting to medium granular structure; very few fine threads and filaments of calcium carbonate; friable.
2	226-253	Ab	Very dark brown (10YR 2/2, dry) silty clay loam; moderate medium subangular blocky structure, parting to moderate to strong medium granular; common very fine, fine, and medium dendritic tubular pores; few fine and medium filaments of calcium carbonate in dendritic tubular pores; sticky; friable.
	253-306+	Btb	Dark grayish brown (10YR 4/2, dry) silty clay loam; fine moderate angular blocky structure; common to many very fine and fine dendritic tubular pores; many continuous distinct clay films throughout the matrix; few very fine manganese inclusions; sticky.

Soil Mapping Unit: Rossville Soil Series

Geomorphology: Newman Terrace surface above oxbox, 100% grass cover, near western boundary of the LWC.

Auger Test 4 (Area C)

Soil No.	Depth (cm)	Horizon	Description
1	0-34	Ap	Very dark grayish brown (10YR 3/2, dry); fine moderate granular structure; common fine and medium roots; friable.
	34-42	A1	Very dark grayish brown (10YR 3/2, dry) silt loam with very dark gray (10YR 3/1) mottles throughout the matrix; fine moderate granular structure; few very fine and fine roots; many very fine and fine dendritic tubular pore; friable.
	42-77	A2	Very dark grayish brown (10YR 3/2, dry) silty clay loam with very dark gray (10YR 3/1) mottles throughout the matrix; fine moderate granular structure; few very fine and fine roots; many very fine and fine dendritic tubular pore; sticky; friable.
	77-88	C1	Brown (10YR 4/3, dry) silt loam; massive parting to single grain; few fine and medium roots; very friable.
	88-107	C2	Pale Brown (10YR 6/3, dry) silt loam; massive parting to single grain; few fine and medium roots; very friable.
	107-115	C3	Brown (10YR 5/3, dry) silty clay loam with dark grayish brown (10YR 4/2, dry) mottles (50%); massive with few loose sand lenses; few very fine roots; common very fine and fine dendritic tubular pores; few very fine and fine redoximorphic concentrations in dendritic tubular pores; sticky.
	115-150	C4	Brown (10YR 5/3, dry) silt loam with dark grayish brown (10YR 4/2, dry) mottles (50%); massive; few very fine and fine roots; non-sticky; friable.
	150-190	C5	Dark grayish brown (10YR 4/2, dry) silt loam with common lenses of light brownish gray (10YR 6/2, dry) very fine sand throughout the matrix; few very fine nodules of calcium carbonate; very few) redoximorphic concentrations in dendritic tubular pores; massive; friable.
	190-195	C6	Very pale brown (10YR 7/3, dry) very fine sand; massive parting to single grain; soft; loose.
	195-220	C7	Dark grayish brown (10YR 4/2, dry) silt loam with common lenses of light brownish gray (10YR 6/2, dry) very fine sand and very dark grayish brown (10YR 3/2) mottles throughout the matrix; massive; common fine and medium soft nodules of calcium carbonate; very few redoximorphic concentrations in dendritic tubular pores; friable.
2	220-237	Akb	Dark grayish brown (10YR 4/2) silty clay loam; moderate fine to medium subangular blocky structure; few fine roots; common very fine, fine and medium calcium carbonate filaments in dendritic tubular pores; hard.
	237-250	Btb	Dark grayish brown (10YR 4/2, dry) silty clay loam with very dark grayish brown (10YR 3/2, dry) mottles on ped faces; moderate medium subangular blocky structure; continuous prominent clay film on ped faces; hard.
	250-298+	Btkssb	Very dark grayish brown (10YR 3/2, dry) silty clay loam; moderate prismatic structure with common very dark gray (10YR 3/1, dry) prominent discontinuous slickensides; very few threads of calcium carbonate and few coarse to very coarse nodules of calcium carbonate; hard.

Soil Mapping Unit: Kimo Soil Series

Geomorphology: Grass covered meander scar, floodplain tread.

Auger Test 5 (Area A)

Soil No.	Depth (cm)	Horizon	Description
1	0-18	Ap	Very dark brown (10YR 2/2, dry) silt loam, medium platy structure parting to weak fine granular; common fine and medium roots and many very fine roots; sticky; firm.
	18-45	A1	Very dark gray (10YR 3/1, dry) silt loam with dark brown (10YR 3/3, dry) mottles, weak fine subangular block structure; many very fine and fine dendritic tubular pores; firm.
	45-74	A2	Dark yellowish brown (10YR 4/4) silt loam with 50% brown (10YR 4/3, dry) mottles; weak fine subangular blocky structure; common to many very fine and fine dendritic tubular pores; friable.
	74-105	Bw	Brown (10YR 4/3, dry) silty clay loam with brown (10YR 5/3, dry) mottles; weak fine subangular blocky structure; few faint patchy clay films on ped faces; slighty sticky; firm.
	105-130	BC	Brown (10YR 5/3, dry) silt loam; weak coarse subangular block structure; friable.
	130-300+	C	Yellowish brown (10YR 5/4) loam to very fine sand; massive parting to single grain; non-sticky; loose.

Soil Mapping Unit: Rossville Soil Series

Geomorphology: Cultivated field on the surface of the Newman terrace near west side of LWC taxiway, east of Airport Road.

Auger Test 6 (Area A)

Soil No.	Depth (cm)	Horizon	Description
1	0-26	Ap	Very dark grayish brown (10YR 3/2, dry) silt loam, medium platy structure parting to weak fine granular; common fine and medium roots and many very fine roots; sticky; firm.
	26-54	A1	Very dark grayish (10YR 3/2, dry) silt loam with dark brown (10YR 3/3, dry) mottles, weak fine subangular block structure; many very fine and fine dendritic tubular pores; firm.
	54-80	A2	Dark yellowish brown (10YR 4/4) silt loam with 50% brown (10YR 4/3, dry) mottles; weak fine subangular blocky structure; common to many very fine and fine dendritic tubular pores; friable.
	80-97	Bw	Brown (10YR 4/3, dry) silt loam with brown (10YR 5/3, dry) mottles; weak fine subangular blocky structure; few faint patchy clay films on ped faces; slighty sticky; firm.
	97-128	BC	Brown (10YR 5/3, dry) silt loam with brown (10YR 4/3, dry) mottles; weak coarse subangular block structure; friable.
	128-300+	C	Yellowish brown (10YR 5/4) loam to very fine sand; massive parting to single grain; non-sticky; loose.

Soil Mapping Unit: Rossville Soil Series

Geomorphology: Cultivated field on the surface of the Holliday terrace, east of Airport Road.

Auger Test 7 (Area A)

Soil No.	Depth (cm)	Horizon	Description
1	0-17	Ap	Very dark brown (10YR 2/2, dry) silty clay loam, weak medium platy structure parting to weak fine granular; many very fine and coarse roots (root mat); slightly sticky; firm.
	17-49	A1	Very dark brown (10YR 2/2, dry) silt loam; with dark brown (10YR 3/3, dry) mottles, weak fine subangular block structure; many very fine and fine dendritic tubular pores; firm.
	49-80	A2	Dark yellowish brown (10YR 4/4) silt loam with 50% brown (10YR 4/3, dry) mottles; weak fine subangular blocky structure; common to many very fine and fine dendritic tubular pores; friable.
	80-129	Bw1	Brown (10YR 4/3, dry) silt loam with brown (10YR 5/3, dry) mottles; weak fine subangular blocky structure; few faint patchy clay films on ped faces; slighty sticky; friable.
	129-140	Bw2	Dark yellowish brown (10YR 4/4, dry) silt loam with few very fine sand lenses; weak fine subangular blocky structure; common to many very fine and fine dendritic tubular pores; common fine manganese concentrations on ped faces; few ver fine and fine redoximorphic concentrations in dendritic tubular
	140-190	C1	Very pale brown (10YR 7/4, dry) loam; massive structure parting to single grain; soft; loose.
	190-218	C2	Pale brown (10YR 6/3, dry) and light yellowish brown (10YR 6/4, dry) silty clay loam with few sand lenses and many brown (10YR 5/3) mottles throughout; massive structure; hard.
2	218-250	Ab	Brown (10YR 4/3, dry) silt loam; weak fine subangular blocky structure; few very fine roots; few very fine and fine dendritic tubular pores; few very fine redoximorphic concentrations in dendritic tubular pores; few very fine threads of calcium carbonate in dendritic tubular pores; firm.
	250-280	Bt1b	Dark grayish brown (10YR 4/2, dry) silty clay loam; moderate medium subangular blocky structure; prominent discontinuous very dark gray (10YR 3/1, dry) clay films on ped faces, few very fine and fine dentridic tubular pores; few very fine redoximorphic concentrations in dendtritic tubular pores; firm.
	280-300+	Bt2b	Grayish brown (10YR 5/2, dry) silty clay loam; coarse subangular blocky structure; many continuous prominent very dark grayish brown (10YR 3/2, dry) clay films on ped faces; few very fine roots; few very fine redoximorphic concentrations in dendritic tubular pores; few very fine and fine manganese

Soil Mapping Unit: Rossville Soil Series

Geomorphology: Newman Terrace Surface in cultivated field, west of Airport Road.

Auger Test 8 (Area A)

Soil No.	Depth (cm)	Horizon	Description
1	0-23	Ap	Very dark brown (10YR 2/2, dry) silty clay loam, weak medium platy structure parting to weak fine granular; many very fine and coarse roots (root mat); slightly sticky; firm.
	23-40	A1	Very dark brown (10YR 2/2, dry) silt loam; with dark brown (10YR 3/3, dry) mottles, weak fine subangular block structure; many very fine and fine dendritic tubular pores; firm.
	40-62	A2	Dark yellowish brown (10YR 4/4) silt loam with 50% brown (10YR 4/3, dry) mottles; weak fine subangular blocky structure; common to many very fine and fine dendritic tubular pores; friable.
	62-107	Bw1	Brown (10YR 4/3, dry) silt loam with brown (10YR 5/3, dry) mottles; weak fine subangular blocky structure; few faint patchy clay films on ped faces; slighty sticky; friable.
	107-130	Bw2	Dark yellowish brown (10YR 4/4, dry) silt loam with few very fine sand lenses; weak fine subangular blocky structure; common to many very fine and fine dendritic tubular pores; common fine manganese concentrations on ped faces; few ver fine and fine redoximorphic concentrations in dendritic tubular pores; hard.
	130-170	C1	Very pale brown (10YR 7/4, dry) loam; massive structure parting to single grain; soft; loose.
	170-205	C2	Pale brown (10YR 6/3, dry) and light yellowish brown (10YR 6/4, dry) silty clay loam with few sand lenses and many brown (10YR 5/3) mottles throughout; massive structure; hard.
2	205-230	Ab	Brown (10YR 4/3, dry) silt loam; weak fine subangular blocky structure; few very fine roots; few very fine and fine dendritic tubular pores; few very fine redoximorphic concentrations in dendritic tubular pores; few very fine threads of calcium carbonate in dendritic tubular pores; firm.
	230-250+	Btb	Dark grayish brown (10YR 4/2, dry) silty clay loam; moderate medium subangular blocky structure; prominent discontinuous very dark gray (10YR 3/1, dry) clay films on ped faces, few very fine and fine dentridic tubular pores; few very fine redoximorphic concentrations in dendtritic tubular pores; firm.

Soil Mapping Unit: Rossville Soil Series

Geomorphology: Newman Terrace Surface in corn stubble field, west of Airport Road.

Auger Test 9 (Area C)

Soil No.	Depth (cm)	Horizon	Description
1	0-32	Ap	Very dark grayish brown (10YR 3/2, dry) silty clay loam; moderate platy, parting to coarse granular structure; many very fine vesicular pores; many very fine and fine roots, few medium to coarse roots; friable.
	32-48	A1	Very dark grayish brown (10YR 3/2, dry) silt loam; granular structure; few fine and coarse roots. Possible chert nodule or road gravel at 40-48cmbs; friable.
	48-68	A2	Very dark grayish brown (10YR 3/2, dry) silt loam to silty clay loam, granular structure; parting to single grain; few fine to medium vesicular pores; few coarse roots; friable.
	68-104	C1	Very dark gray (7.5YR 3/1, dry) silt loam; weak medium prismatic to weak fine subangular blocky structure; very few very fine to fine dendritic tubular pores; very few medium roots.
	104-119	C2	Very dark grayish brown (10YR 3/2, dry) silty clay; moderate subangular blocky structure; common to many very fine roots; continuous prominent yellowish red (10YR 5/8) redoximorphic concentrations on ped faces; hard.
	119-177	C3	Dark grayish brown (10YR 4/2, dry) mottled with dark brown (7.5YR 3/2, dry) silty clay; moderate subangular blocky structure; prominent strong brown (7.5YR 5/8) redoximorphic concentrations on ped faces; few gravels, few pebble inclusions.
	177-197	C4	Dark grayish brown (10YR 4/2, dry) mottled with dark brown (7.5YR 3/2, dry) silty clay; fine subangular blocky stucture; prominent strong brown (7.5YR 5/8) redoximorphic concentrations on ped faces; few medium roots; few gravels.
	197-210	C5	Black (7.5YR 2/1) silty clay to clay with brown (7.5YR 4/3) sand lenses; coarse angular blocky structure; many medium to coarse dendritic tubular pores, few coarse vesicular pores; few to common fine roots, common very fine roots; distinct clay films on ped faces; hard. Terminated at hard, compact clay.

Soil Mapping Unit: Kimo Soil Series

Geomorphology: Grass covered meander scar, floodplain tread.

Auger Test 10 (Area C)

Soil No.	Depth (cm)	Horizon	Description
1	0-12	Ap	Very dark brown (10YR 2/2, dry) silt loam; platy parting to weak fine to medium granular structure; common very fine and fine and few coarse roots; common to many fine dendritic tubular pores; few pebbles and gravels; friable.
	12-38	A1	Very dark brown (10YR 2/2, dry) silt loam; weak fine to medium subangular blocky structure; common very fine and fine and few coarse roots; common to many fine dendritic tubular pores; friable.
	38-74	A2	Very dark grayish brown (10YR 3/2, dry) mottled with (10YR 4/3, dry) dark grayish brown silt loam; weak to moderate subangular blocky structure; few very fine, fine, medium, and coarse roots, common dendritic tubular pores; very fine strong brown (7.5 4/6, dry) redoximorphic concentrations in dendritic tubular pores; sticky; friable.
	74-93	Bw	Brown (10YR 4/3, dry) mottled (20%) with very dark grayish brown (10YR 3/2, dry); weak medium subangular blocky structure; common very fine and fine dendritic tubular pores; few very fine redoximorphic concentrations in dendritic tubular pores; sticky; friable.
	93-118	C1	Pale brown (10YR 6/3, dry) silt loam; massive structure, parting to single grain; homogenous but increasing in sand with depth; very friable to loose.
	118-148	C2	Pale brown (10YR 6/3, dry) mottled (20%) with dark grayish brown (10YR 4/2, dry) silty clay loam; weak fine subangular blocky parting to medium granular structure; very few fine threads and filaments of calcium carbonate; friable.
2	148-181	Ab	Very dark brown (10YR 2/2, dry) silty clay loam; moderate medium subangular blocky structure, parting to moderate to strong medium granular; common very fine, fine, and medium dendritic tubular pores; few fine and medium filaments of calcium carbonate in dendritic tubular pores; sticky; friable.
	181-205	Btb	Dark grayish brown (10YR 4/2, dry) silty clay loam; fine moderate angular blocky structure; common to many very fine and fine dendritic tubular pores; many continuous distinct clay films throughout the matrix; few very fine manganese inclusions; sticky. Terminated at hard, compact clay.

Soil Mapping Unit: Rossville Soil Series

Geomorphology: Newman Terrace surface above oxbow, 100% grass cover, near western boundary of LWC. Transition area between Newman Terrace and floodplain tread.

APPENDIX C

KANSAS ARCHAEOLOGICAL SITE INVENTORY: 14DO1014 – FIRST REVISION

14DO1014 — Kansas Archeological Site Inventory

Site number: 14DO1014
Site name:
County: Douglas
Site type: Agrarian
Domestic
Original or revision: First
UBS number: Not assigned
Component: Single

General Time Period(s):	Specific time period(s):
Historic European/American/Afro-American:	1861-1900
	1900-1954

Cultural affiliation: Euro American

Site description: Site 14DO1014 is a historic artifact scatter site located southeast of the Lawrence Municipal Airport in the southeast corner of a large plowed field (Figures 1 and 2). The artifact scatter is all that remains of a farmstead that once stood at this location. When RCG&A visited the site in January 2015, the field had been harvested of its soybean crop (Figure 3). U.S. Hwy 24/40 forms the south boundary of the site and E1600 Rd forms the east boundary. The north and west boundaries indicate the extent of the artifact scatter as defined through pedestrian survey and shovel testing.

Artifacts observed but not collected: A total of 285 artifacts (n=208 from surface, n=77 from shovel tests) at 14DO1014. The artifact assemblage was dominated by glass, with ceramics, metal, building materials, and other materials. The glass sub-assemblage consisted of both container and window shards and two marbles. Shards from bottles and jars of amber, aqua, cobalt, colorless, blue and green milk, and solarized amethyst glass were all identified. Ceramics were whiteware, stoneware, ironstone and porcelain domestic and industrial ceramic sherds also were recorded. The metal items included cast iron drain pipe fragments, a tin can fragment, a bar, a buckle, and several unidentified fragments. The building materials category included bricks, bricks with mortar adhering, concrete, and a piece of paving tile. Finally, the other materials included fragments of coal and charcoal and one burned bone fragment. The diagnostic materials suggest an occupation date range from the late nineteenth through mid twentieth century.

Artifacts collected: None

Location of artifacts: None listed

Present condition: Cultivated

Disturbance to site: Cultivation, previous structures have been removed, no foundations visible.

Site has been tested: No **Site has been excavated:** No **NRHP status:** Site has been evaluated.
Evaluated on 20-Jan-2015.
Site is not eligible.
Site is not listed.

Recommendations for further work: Site 14DO1014 was evaluated applying the National Register criteria for evaluation (36 CFR 60.4 [a-d]). It is a historic farmstead site that appears to have been occupied from the mid nineteenth through mid twentieth century. There is no evidence that the property is eligible for its association with events significant to local, state, or national history (Criterion A).
The property where 14DO1014 is located was owned by Dr. Charles Robinson. Robinsons association with the farm at 14DO1014 was one of landlord. During the twentieth century, the Hayden family occupied this site for more than 60 years. Site 14DO1014 is not intricately associated with the lives of persons significant in our past (Criterion B).
No extant structures are present at the site, and historic aerial images of the farmstead do not suggest that the site configuration was distinctive (Criterion C). While archeological testing revealed limited subsurface deposits, no intact archeological features were encountered. Extensive agricultural activity and razing of the former buildings has destroyed the integrity of the site. Thus, the site did not yield, nor is it likely to yield, information important to history or prehistory (Criterion D). Therefore, 14DO1014 does not possess those qualities of significance and integrity as defined by the National Register criteria for evaluation (36 CFR 60.4 [a-d]). Site 14DO1014 is not an historic property, and no further work is recommended.

Comments: Historic cartographic research revealed a single structure was depicted on the property in F.W. Beers (1873), and Ogle (1902) plat atlases. The 1909 plat by Armstrong and Soudea does not show a structure on the property; however, several buildings depicted on earlier and later maps are not depicted on this map so it is not considered a reliable resource. Structures, two this time, are depicted at 14DO1014 on a 1921 plat by George A. Ogle & Co. (Figure 4). The 1948 aerial photograph shows at least six structures (Figure 5). By 1967, several of the structures had been removed, and portions of the property have been converted to an agricultural field. Mr. Nunemaker, a descendent of the occupants of 14DO1014, reported the last building at the site was demolished in the late 1970s and aerial photograph shows the entire property had been converted to an agricultural field by 1985.
When RCG&A visited the site on January 19-20, 2015, the archeologists conducted a pedestrian survey across the previously recorded site area at 5 m intervals. The crew reported 50 percent ground surface visibility throughout the site area. A moderately dense scatter of historic surface artifacts was observed; no features are present at the site. All observed surface artifacts were flagged during survey and the outermost artifacts were piece-plotted to document the surface extent of the scatter. Diagnostic artifacts also were piece-plotted to maintain spatial control over temporally sensitive data. Piece-plotted artifacts are depicted on Figure 2. The remaining surface artifacts were tallied by artifact class and type.
Shovel tests were excavated to assist in the delineation of the north and west site boundaries and to characterize the subsurface cultural deposits. The shovel tests were plotted from the center of the surface scatter along one transect north and one transect west. No shovel tests were excavated to the east or south, since roads comprise those boundaries. Shovel tests were laid out at 15 m intervals and selected positive tests were delineated at 5 m intervals until excavators encountered two consecutive negative shovel tests. RCG&A excavated 27 shovel tests at 14DO1014. Nine of the tests were positive for historic cultural material, yielding 77 artifacts from 0-20 cm below surface. The typical soil profile consisted of two strata. Stratum I (0-25/30 cmbs) consisted of the plow zone, a very dark grayish brown (10YR 3/2) silt loam. Stratum II (25/30 35/40 cmbs) consisted of brown (10YR 4/4) silt loam.
Using the extent of the surface scatter and positive shovel tests, RCG&A created a revised site boundary. The revised site boundary is essentially the same size and shape as the original, but it plots slightly south. Such variation in the site boundary is expected in an active agricultural field. The 14DO1014 surface and subsurface artifact assemblage is indicative of a variety of domestic activities taking place there during the first half of the twentieth century. A domestic artifact assemblage is consistent with historic research and information provided by Mr. Kent Nunemaker, who reported that this site was a farmstead from the late nineteenth century through the mid twentieth

century (see attachment Property History).

Historic maps, references, or informants:

Historic Maps:
F. W. Beers & Co., 1873 Atlas of Douglas County. Kansas. F.W. Beers & Co., New York. George A. Ogle and Co., 1902 Standard Atlas of Douglas County, Kansas. George A. Ogle and Co., Chicago and 1921 Standard Atlas of Douglas County, Kansas. George A. Ogle and Co., Chicago.

Reference:
Ritterbush, Lauren W. and India S. Hesse, 1996 Douglas County (Kansas) Archaeological Survey. Project Report Series No. 97, Museum of Anthropology, University of Kansas, Lawrence. Report available from the Kansas State Historic Preservation Office, Topeka, Kansas (B1927).

Informant:
Mr. Kent Nunemaker, a descendent of Adrian K. Hayden who arrived at this property in 1903. The Hayden-Nunemaker-Ross family has been tenants of the property where 14DO1014 is located for more than 100 years. Mr. Nunemaker has firsthand knowledge of the site.

Site owner or tenant:

KU Endownment Association
PO Box 913
Hutchinson
KS 67504 and City of Lawrence
PO Box 708
Lawrence
KS
66044-0708.

Topographic location: Terrace

Drainage: Unnamed tributaries of Mud Creek run both north and south of the site. Mud Creek drains to the Kansas River.

USGS map name: Midland **USGS map date:** 1978

Legal location:

1. Section: SE, SE, SE of 17 Township: 12 S Range: 20 E	2. Section: None listed Township: Range:	3. Section: None listed Township: Range:	4. Section: None listed Township: Range:

UTM datum: NAD83 1. N 4319208
Zone: 14 E 308955

Area: 8821 square meters

Recorded by:

Shannon Ryan
850 E. 13th St., Suite C
Lawrence
KS , 66044 785-856-0744
lawrence@rcgoodwin.com

Affiliation: Archeological Contractor **Agency/Company name:** R. Christopher Goodwin & Associates

Record Date: 10-Feb-2015
Last updated 11-Feb-2015

Radiocarbon dates: None listed.

Bibliography:

1927. Ritterbush, Lauren W. and India S. Hesse:
Douglas County (Kansas) Archaeological Survey. Project Report Series No. 97, Museum of Anthropology, KU, Lawrence. (1996)
View PDF

Map files

None uploaded

Supporting Documents

Figures 1-5 with captions.: *20150211_1_SITEFORMFIGURESATTACHMENT.PDF*

Property History: *20150211_2_SITE14DO1014PROPERTYHISTORY.PDF*

Figures for 14DO1014 Site Form-First Revision

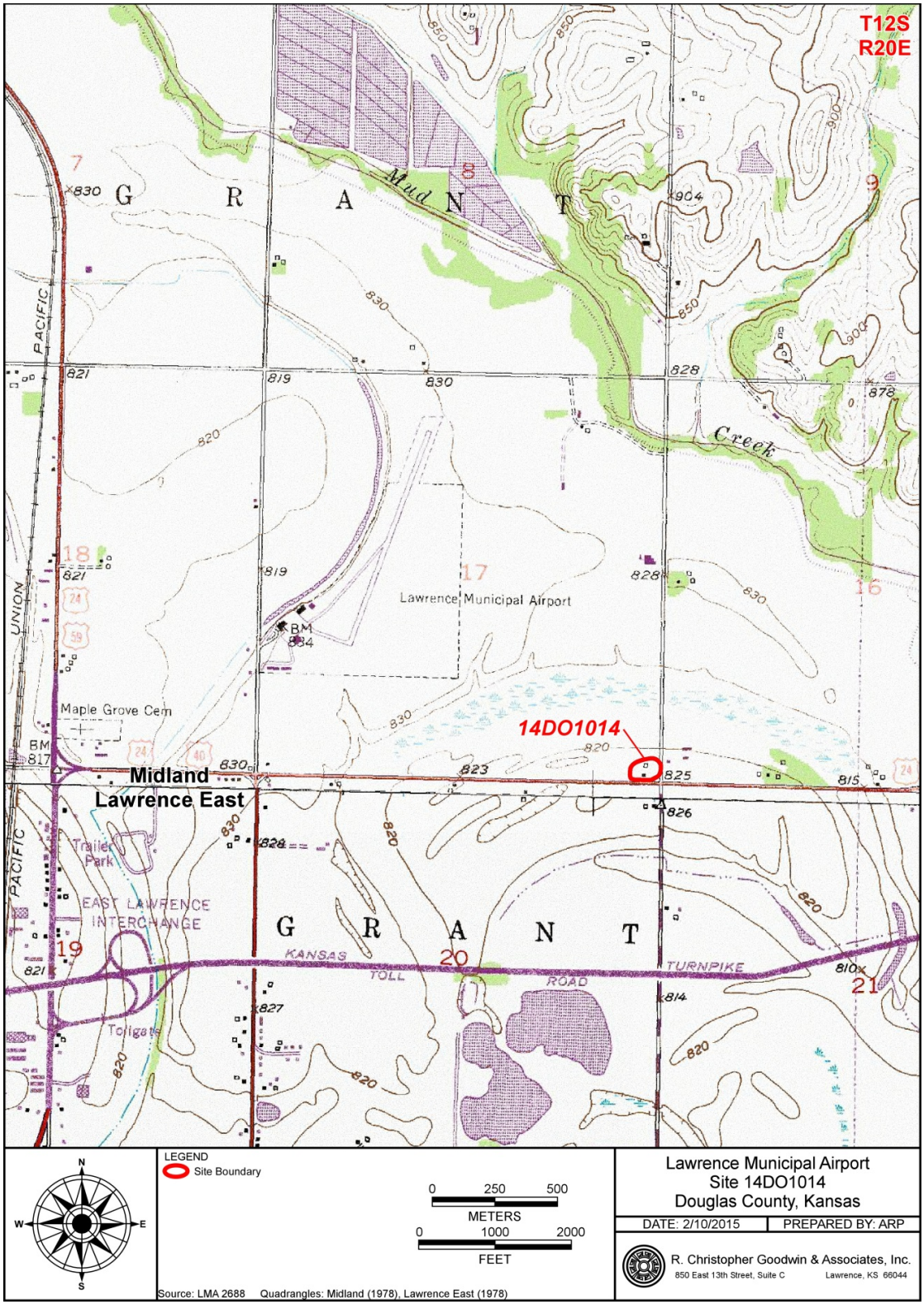


Figure 1. Site 14DO1014 plotted on the Midland (1978) quadrangle.

Figures for 14DO1014 Site Form-First Revision

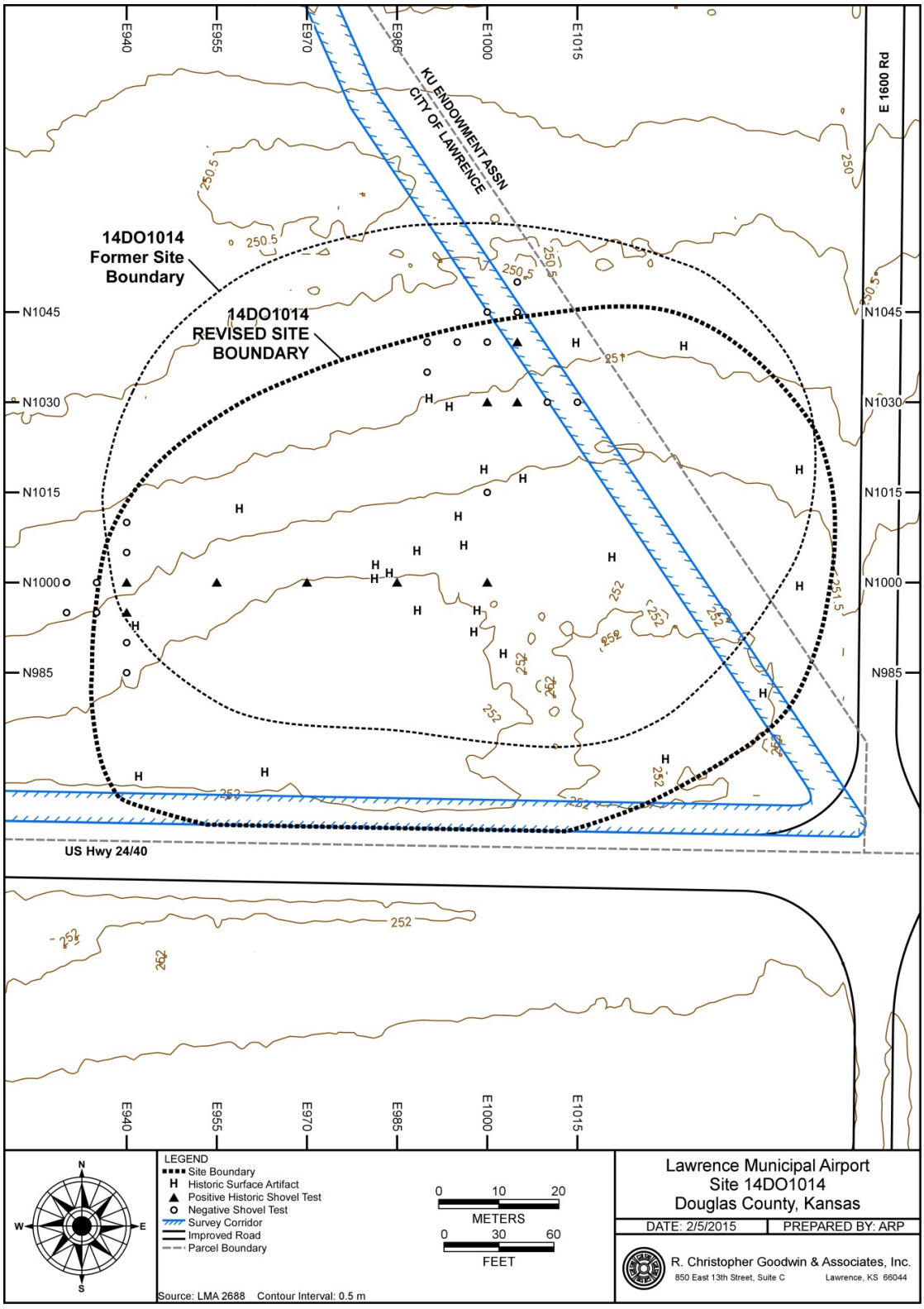


Figure 2. Plan map of 14DO1014.

Figures for 14DO1014 Site Form-First Revision

Figure 3. Overview of Site 14DO1014 looking west. U.S. Hwy 24/40 is visible at photo left and the airport buildings can be seen in the distance.

Figures for 14DO1014 Site Form-First Revision

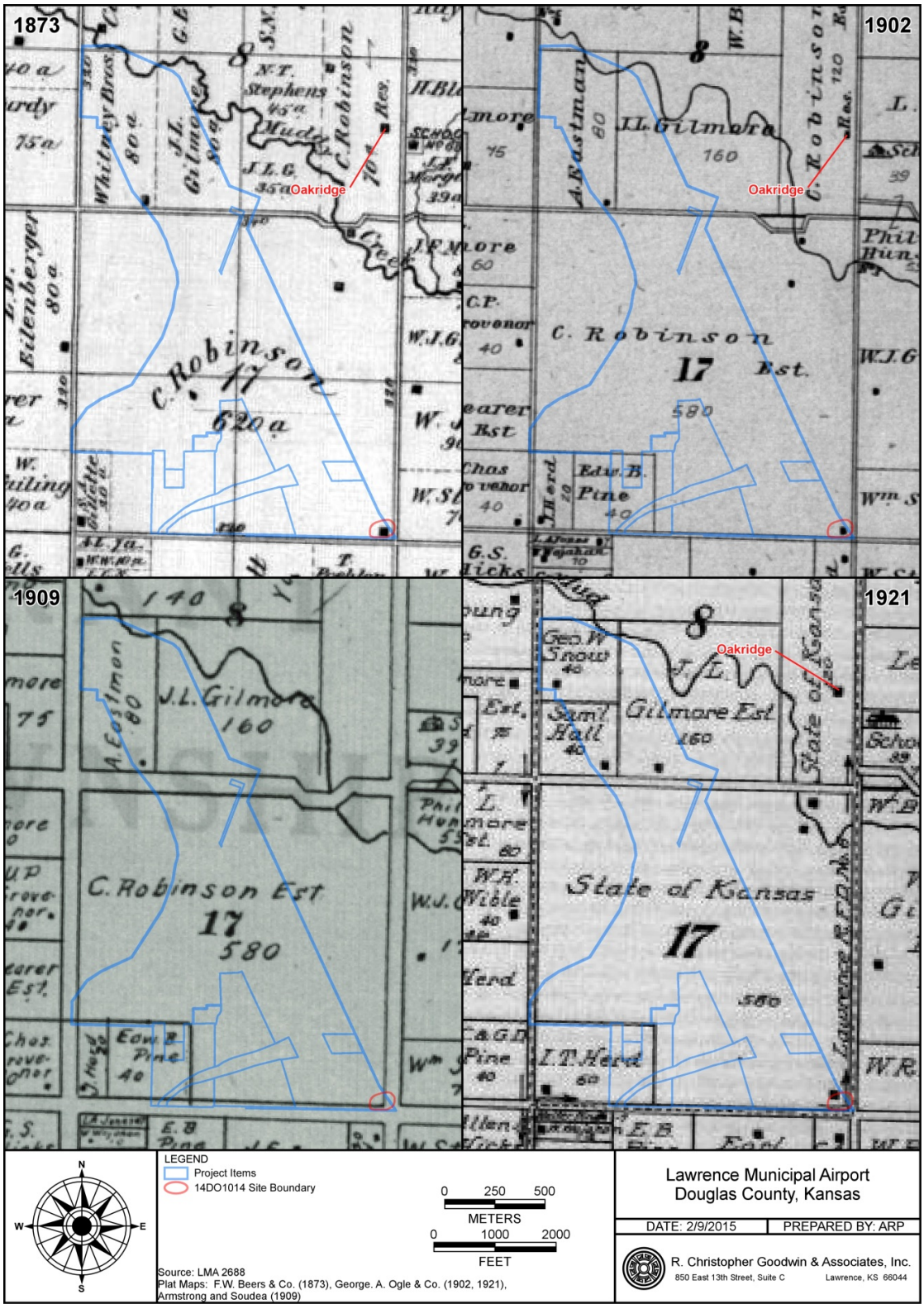


Figure 4. The location of the Lawrence Municipal Airport Project areas, 14DO1014 site boundary, and Oakridge plotted on four historic plat maps.

Figures for 14DO1014 Site Form-First Revision

Figure 5. Historic aerial images showing the location of 14DO1014. Farmstead structures are visible in the 1937, 1948, and 1967 images; by 1991 the area has been incorporated into the agricultural field.

Site 14DO1014 Property History

R. Christopher Goodwin & Associates, Inc. (RCG&A)

February 2015

Site 14DO1014 is located in the SE ¼ of the SE ¼ of the SE ¼ of Section 17, T12S, R20E in Grant Township, Douglas County, Kansas. Grant Township was incorporated into Douglas County after the Kansas Legislature allowed for it to be removed from Sarcoxie Township in Jefferson County in the late 1860s (Cutler 1883).

During the Early Historic period, the Kansa Indians occupied this region; however, in 1825, they signed a treaty that gave up this area to the United States government. The Delaware were an eastern tribe that had been gradually moved west through a series of treaties with the United States (Obermeyer 2009). From 1829-1831 they moved to lands in Kansas vacated a few years earlier by the Kansa (Obermeyer 2009; Unrau 2001). The Kansas reservation was reduced in size through a series of treaties in 1854, 1860, and 1866. In 1854 they ceded the Delaware outlet, a strip of land that extended west of the main reservation, and other lands (Kappler 1904). The 1860 treaty allotted the reservation lands to members of the tribe and, in the 1866 treaty, the Delaware gave up the remainder of their land and moved to Indian Territory (Kappler 1904).

The next landowner of record for Section 17, T12S, R20E is Dr. Charles Lawrence Robinson. Robinson acquired the property in the early 1860s, perhaps as early as 1861 when he, Robert S. Stevens, and William A. Simpson purchased much of North Lawrence from the Delaware chief, Sarcoxie (Rowe 1952). Sarcoxie had been allotted 720 acres of land in the 1860 Delaware treaty with the United States of which he was a signatory (Kappler 1904; Rowe 1952; Woodlawn Parent Teachers Association 1961:9). By 1873, it is clear that Robinson owns the property in question (F.W. Beers & Co. 1873). In addition to most of Section 17, Robinson owned several other properties in the vicinity and he and his wife lived in a house known as Oakridge, in SE ¼ of Section 8, approximately a mile north of 14DO1014 (Figure 4).

Robinson was a businessman, education advocate, farmer, politician, and abolitionist. He was born in 1818 in Massachusetts where he grew up and was trained as a medical doctor. After his education, Robinson worked as a teacher, practiced medicine, and married. In 1946, his wife, Sarah Robinson née Adams, passed away. Then, in 1849, he traveled to California for the gold rush. In 1851, he returned to his home state. Back in Massachusetts, Robinson got married again, this time to a woman named Sara Tappan Doolittle Lawrence. In 1854, Robinson, traveled to the nascent Kansas Territory as a member of the New England Emigrant Aid Company. Sara followed him to Kansas in 1855 (Keating 2015). A primary motivation for this move was Robinson's strong abolitionist feelings. In Kansas Territory, Robinson assisted in the founding of the City of Lawrence, where he and his wife made their home. An active Free-State advocate prior to Kansas' statehood, he was elected the first governor of the state in 1861 serving until 1863. While governor, Robinson was associated with a scandal and impeached; however, he was later acquitted of the charges. In 1874 and 1876 Robinson served in the Kansas Legislature. Robinson was on the first Kansas Board of Regents and, from 1887-1889, was president of Haskell Institute (Blackmar 1902:292; Woodlawn Parent Teachers Association 1961:13). Robinson also served as president of the Kansas Historical Society from 1879-1880 and continued to be a public figure in Kansas until his death in 1894 (Corbin 1969).

After arriving in Kansas territory in 1854, Charles and Sara lived in Lawrence in a home on Mount Oread (Blackmar 1902:292). On May 21, 1856 their home was burned during the sack of Lawrence (Griffin 1968; Robinson 1857). Although they rebuilt, their home was threatened again in August 1863 when Quantrill raided the city (Keating 2015). Subsequently, the Robinsons moved to their farm home, Oakridge. As described above, Oakridge was located in the SE ¼ of Section 8 (Figure 4). Oakridge and the surrounding land Robinson owned (including Section 17) was willed to the University of Kansas (KU) upon his death. However, his wife, Sara retained a life interest in this property and continued to live at Oakridge until her death in 1911. According to an article written at the time of her death, the Robinson bequest to KU totaled around $200,000 (*Christian Register* 30 November 1911:1249). The Robinsons are buried at Oak Hill Cemetery, Lawrence.

From Oakridge, the Robinsons managed a significant farm with several tenants. As a building is depicted at 14DO1014 as early as 1873 (F.W. Beers & Co. 1873), we can conclude this was the location of one of the Robinson's tenant farms at least by that year. Although the nineteenth century leases of this property are unknown, the Hayden family rented it throughout most of the twentieth century.

In 1903, Adrian Kepler Hayden moved with family from Arkansas to Douglas County, Kansas (*Lawrence Journal World* [LJW], 25 September 1975:7; U.S. Census 1900). In the 1905 Kansas Census the family, consisting of Adrian, his wife Mary, and their five children, is enumerated in Grant Township, presumably living at the location of 14DO1014 (Ancestry.com 2009). Mr. Kent Nunemaker, a descendant of Adrian Hayden, provided support for this conclusion when he visited the RCG&A field crew during their delineation of the site on January 19, 2015. Mr. Nunemaker stated his family had rented the property in question for more than 100 years. In addition to farming, Adrian and his brother Japhan Jupiter Hayden built and operated a blacksmith shop on the corner property in 1907 (Personal Communication, Kent Nunemaker, January 19, 2015). Although Japhan is not enumerated with Adrian's family in 1910 or 1915, he is listed with his brother in Grant Township in 1920 (Ancestry.com 2009; U.S. Census 1910, 1920). According to Mr. Nunemaker, a two-story house was constructed on this property in 1911 and a one-story house also was present (he did not provide a construction date for the one story house). Other structures at this farmstead included a hayshed north of the houses, the blacksmith shop, and a well with an associated windmill (Personal Communication, Kent Nunemaker, January 19, 2015). These buildings and others can be seen on aerial photos from the first half of the twentieth century (Figure 5).

RCG&A identified a lease between the property owner, the State of Kansas, and Adrian Hayden for 1918-1923 (Douglas County Courthouse Records [DCCR], Book 102, Page 61). This lease is signed by both Adrian and his son, Willard H. (aka Will). Will Hayden was approximately 25 years old in 1918 and had begun contributing to the family farm. Father and son continued to farm together until Adrian Hayden died in 1942. Adrian is buried at Maple Grove Cemetery just north of the junction of Highways 59 and 24/40, approximately 1.5 miles west of 14DO1014 (Find A Grave 2008). At the time of his death, Mr. Hayden was living in the City of Lawrence; however it appears Will lived on the property in Section 17 into the mid twentieth century. Will Hayden retired from farming around 1960, but a 1965 plat map indicates Will was still living at 14DO1014 (Directory Service Company 1965); however, in 1969, he and his wife moved away (LJW 6 October 1979:7). By the late 1970s when the airport expansion occurred, the farm buildings had all been removed or abandoned (Personal Communication, Kent Nunemaker, January 19, 2015). According to Mr. Nunemaker, the one-story house and windmill were moved in the late 1950s and the two-story house was demolished with the airport expansion. By 1985, aerial photographs show that there were no remaining structures at the former farmstead.

As a prominent member of the Oak Ridge neighborhood and Grant Township, Will Hayden served as an elected member of the Douglas County Board of Commissioners for the Second District from 1957-1960 (LJW 22 February 1957:2; LJW 3 November 1960:1). Also during his lifetime he expanded the family farm significantly and included his son-in-law Eugene Wilford Nunemaker in the business (LJW 12 November 1987:3A). Will and his wife Mary are buried at Oak Hill Cemetery in Lawrence.

In 1966, the 14DO1014 property was deeded to the KU Endowment Association from the State of Kansas Board of Regents (DCCR Book 245, Page 96). The Lawrence Municipal Airport underwent an expansion in the late 1970s; as a part of this expansion, the KU Endowment conveyed the majority of the 14DO1014 site area to the City of Lawrence in 1978 (DCCR, Book 325, Page 1486). The property boundary created by this conveyance is extant today (Figure 2). The City of Lawrence annexed their portion of the property in 1979 (DCCR Book 332, Page 440); the rest of the property is still owned by the KU Endowment Association. Although the buildings at 14DO1014 were all demolished by 1985 and ownership of the land has changed, Hayden descendants have continued to farm the land into the twenty first century (Personal Communication, Kent Nunemaker, January 19, 2015).

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6425 SW 6th Avenue
Topeka, KS 66615

Kansas

phone: 785-272-8681
fax: 785-272-8682
email@kshs.org

Kansas Historical Society

Sam Brownback, Governor
Jennie Chinn, Executive Director

KSR&C No. 14-08-144

March 30, 2015

Steve Marshall
Planning Group Manager
Airport Development Group Inc.
1776 South Jackson Street, Suite 950
Denver, CO 80210-3808

Via E-Mail

RE: Lawrence Municipal Airport Improvements
FAA AIP Project No. 03-20-0047-17-2014
Douglas County

Dear Mr. Marshall:

The Kansas State Historic Preservation Office has reviewed a report entitled: *Intensive Phase II Archeological Investigations of Proposed Improvements at the Lawrence Municipal Airport, City of Lawrence, Douglas County, Kansas* by Janice A. McLean, Laura R. Murphy, Shannon R. Ryan, Dawn M. Munger, Garrett A. Welch, Paul A. Demers, Patrick M Green, and Alan R. Potter of R. Christopher Goodwin & Associates. We find the report to be acceptable. Our office concurs that site 14DO1014 is not eligible for listing in the National Register of Historic Places, and that site 14DO1020 does not extend onto airport property. We further agree that additional deep testing should be undertaken in the northern portion of Area A (depicted in red in Figure 6.5) should any future undertakings there require excavations greater than 65 inches in depth. We conclude that the project as currently proposed will have no adverse effect on historic properties as defined in 36 CFR 800. Our office has no objection to the airport improvement project.

This information is provided at your request to assist you in identifying historic properties, as specified in 36 CFR 800 for Section 106 consultation procedures. If you have questions or need additional information regarding these comments, please contact Tim Weston at 785-272-8681 (ext. 214) or Sarah Hunter at 785-272-8681 ext. 225. Please refer to the Kansas Review & Compliance number (KSR&C#) above on all future correspondence relating to this project.

Sincerely,

Jennie Chinn
Executive Director and
State Historic Preservation Officer

Timothy Weston for

Patrick Zollner
Deputy State Historic Preservation Officer

Appendix F: Wetland Delineation, Consultation and Preliminary JD

AIRPORT
DEVELOPMENT
GROUP INC.

ADG

December 31, 2014

Matthew Sailor
Regulatory Branch
U.S. Army Corps of Engineers
Kansas City District
635 Federal Building
601 E 12th Street
Kansas City, MO 64106-2824

Subject: Regulatory File No. NWK-2014-673
Lawrence Municipal Airport, Lawrence, Kansas
Request for Jurisdictional Determination

Dear Mr. Sailor:

As we have previously discussed, the City of Lawrence and its Airport Committee have initiated an Environmental Assessment process for the proposed airport development previously described in our May 19, 2014 correspondence. Based on your letter of June 17, 2014, ADG personnel have conducted a detailed site visit and wetland delineation field review of the Lawrence Municipal Airport during October 8-9, 2014. ADG personnel have completed the wetland assessments and have included documentation for your review and jurisdictional determination. We have included USACE Midwest Region wetland determination data forms (9 data points, as previously discussed), the NRCS soil map of the area, and a USGS topographic map and aerial map indicating the data point locations as well as the boundaries of the proposed airport expansion activities.

At this time, the ADG engineering staff is coordinating the design phase of the proposed airport improvements. Upon receipt of your jurisdictional determination, ADG will coordinate with your office on the appropriate permit action that will be required, be it an NWP or an IP. Based upon our review of the site it appears that all identified data points would be considered jurisdictional. It should be noted that there are no planned impacts to the polygon A area, oxbow drainage. The proposed impact due to the construction activities will only occur to the polygons, identified as B and C. The polygon B and C drainage feature may require rechanneling based on a drainage study currently under evaluation by ADG engineers.

Please consider this our formal request for you to conduct a jurisdictional determination and identify any additional impacts which may be of importance. We are grateful for your assistance with this issue. Your comments are important for this process and will be appended to the draft and final EA.

If you have questions or require further information regarding this request, please contact Steve Marshall at (303) 782-0882.

3900 Lakeland Drive • Suite 501C
Jackson, Mississippi 39232

601.932.6920 • 601.932.6901 fax
www.ADGAirports.com

Denver, CO • Jackson, MS • Lawrence, KS • Salt Lake City, UT

Sincerely,

Gary Behrens
Environmental Scientist

Enclosures

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site:	Lawrence Municipal Airport	City/County:	Lawrence / Douglas	Sampling Date:	10/8/2014
Applicant/Owner:	City of Lawrence	State:	KS	Sampling Point:	A-01
Investigator(s):	G.K. Behrens	Section, Township, Range:	S17, T12S, R20	Site ID	
Landform (hillslope, terrace, etc.):	Oxbow drainage	Local relief (concave, convex, none):	concave	Slope (%):	0-1
GPS: UTM	xxs xxxxxxxe xxxxxxxn	Lat:	39.016057	Long: -95.221881	Datum: WGS-84
Soil Map Unit Name:	Kimo Silty Clay loam			NWI classification:	

Are climatic / hydrologic conditions on the site typical for this time of year? Yes [ ] No [X] (If no, explain in Remarks.)

Are Vegetation [N], Soil [N], or Hydrology [N] significantly disturbed? Are "Normal Circumstances" present? Yes [ ] No [X]

Are Vegetation [N], Soil [N], or Hydrology [N] naturally problematic? (If needed, explain answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	X	No		
Hydric Soil Present?	Yes	X	No		
Wetland Hydrology Present?	Yes	X	No		

Is the Sampled Area within a Wetland? Yes [X] No [ ]

Remarks: **Drainage area has more water present than normal October. Drainage feature has been minimally impacted due to historic ag ops.**

VEGETATION - Use scientific names of plants.

		Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30ft radius)				
1	NA			
2				
3				
4				
			= Total Cover	
Sapling/Shrub Stratum (Plot Size: 15ft radius)				
1	NA			
2				
3				
4				
5				
			= Total Cover	
Herb Stratum (Plot Size: 5ft radius)				
1	Alopecurus pratensis (Meadow foxtail)	30	Y	FACW
2	Carex aquatilis (Water sedge)	40	Y	OBL
3	Polygonum amphibium (Water smartweed)	25	Y	FACW
4	UNK	5		
5				
6				
7				
8				
9				
10				
		95	= Total Cover	
Woody Vine Stratum (Plot Size: 30ft radius)				
1	NA			
2				
			= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC	95	(A/B)

Prevalence Index worksheet:

Total % Cover of:

OBL Species	40	x 1 =	40
FACW Species	55	x 2 =	110
FAC Species		x 3 =	
FACU Species		x 4 =	
UPL Species		x 5 =	
Column Totals:	95 (A)		150 (B)

Prevalence Index = B/A: 1.6

Hydrophytic Vegetation Indicators:

- [X] Dominance Test is > 50%
- [X] Prevalence Index is <= 3.0 (1)
- [ ] Morphological Adaptations (1) (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation (1) (Explain)

(1) Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? Yes [X] No [ ]

Remarks: **Only herbaceous / forb stratum present at this sample location.**

SOIL

Sampling Point: **A-01**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Horizon	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Abundance/Contrast	Redox Features Type (1)	Redox Features Loc (2)	Texture	Remarks
0-12	A	10YR 3/1	100	NA					clayey loam	

(1) Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or coated Sand Grains.

(2) Location: PL= Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

	Histosol (A1)		Sandy Gleyed Matrix (S4)
	Histic Epipedon (A2)		Sandy Redox (S5)
	Black Histic (A3)		Stripped Matrix (S6)
	Hydrogen Sulfide (A4)		Loamy Mucky Mineral (F1)
	Stratified Layers (A5)		Loamy Gleyed Matrix (F2)
	2 cm Muck (A10)		Depleted Matrix (F3)
	Depleted Below Dark Surface (A11)		Redox Dark Surface (F6)
X	Thick Dark Surface (A12)		Depleted Dark Surface (F7)
	Sandy Mucky Mineral (S1)		Redox Depressions (F8)
	5 cm Mucky Peat or Peat (S3)		

Indicators for Problematic Hydric Soils (3)

	Coast Prairie Redox (A16)
	Iron-Manganese Masses (F12)
	Other (Explain in Remarks)

(3) Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Clay

Depth (inches): 12+

Hydric Soil Present? Yes: X No:

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

X	Surface water (A1)		Water-stained leaves (B9)
	High water table (A2)		Aquatic Fauna (B13)
X	Saturation (A3)		True Aquatic Plants (B14)
	Water marks (B1)		Hydrogen sulfide odor (C1)
	Sediment deposits (B2)		Oxidized rhizospheres on living roots (C3)
	Drift deposits (B3)		Presence of reduced iron (C4)
	Algal mat or crust (B4)		Recent Iron Reduction in Tilled Soils (C6)
	Iron deposits (B5)		Thin muck surface (C7)
X	Inundation visible on aerial imagery (B7)		Gauge or Well Data (D9)
	Sparsely Vegetated Concave Surface (B8)		Other (explain in Remarks)

Secondary Indicators (minimum of two required)

	Surface soil cracks (B6)
X	Drainage patterns (B10)
	Dry-Season Water Table (C2)
	Crayfish burrows (C8)
X	Saturation visible on aerial imagery (C9)
	Stunted or Stressed Plants (D2)
	Geomorphic position (D2)
	FAC-neutral test (D5)
	Other (explain in Remarks)

Field Observations:

Surface Water Present?	Yes	X	No		Depth (inches)	
Water Table Present?	Yes	X	No		Depth (inches)	
Saturation Present? (includes capillary fringe)	Yes	X	No		Depth (inches)	

Wetland Hydrology Present? Yes: X No:

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: See attached aerial photo

Remarks: **Density/plasticity of clayey loam allowed limited infiltration into test hole. Surface water was approximately 6 ft from test hole and ~1 ft deep.**

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site:	Lawrence Municipal Airport	City/County:	Lawrence / Douglas	Sampling Date:	10/8/2014
Applicant/Owner:	City of Lawrence	State:	KS	Sampling Point:	A-08
Investigator(s):	G.K. Behrens	Section, Township, Range:	S17, T12S, R20	Site ID	
Landform (hillslope, terrace, etc.):	Oxbow drainage	Local relief (concave, convex, none):	concave	Slope (%):	0-1
GPS: UTM	xxs xxxxxxxe xxxxxxxn	Lat:	39.014979	Long: -95.219949	Datum: WGS-84
Soil Map Unit Name:	Kimo Silty Clay loam	NWI classification:			

Are climatic / hydrologic conditions on the site typical for this time of year? Yes [ ] No [X] (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes [ ] No [X]

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	X	No		Is the Sampled Area within a Wetland? Yes X No
Hydric Soil Present?	Yes	X	No		
Wetland Hydrology Present?	Yes	X	No		

Remarks: **Drainage area has significantly more water present than normal October levels.**

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30ft radius)			
1 Ulmus americana (American elm)	10	Y	FACW
2			
3			
4			
	10	= Total Cover	
Sapling/Shrub Stratum (Plot Size: 15ft radius)			
1 Cephalanthus occidentalis (Common buttonbush)	30	Y	OBL
2 Salix nigra (Black willow)	10	Y	OBL
3			
4			
5			
	40	= Total Cover	
Herb Stratum (Plot Size: 5ft radius)			
1 Alopecurus pratensis (Meadow foxtail)	20	Y	FACW
2 Polygonum amphibium (Water smartweed)	20	Y	FACW
3 Carex aquatilis (Water sedge)	5		OBL
4			
5			
6			
7			
8			
9			
10			
	45	= Total Cover	
Woody Vine Stratum (Plot Size: 30ft radius)			
1 Smilax herbacea (Smooth carrion flower)	5	Y	FAC
2			
	5	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC	95	(A/B)

Prevalence Index worksheet:

Total % Cover of:

OBL Species	45	x 1 =	45
FACW Species	50	x 2 =	100
FAC Species	5	x 3 =	15
FACU Species		x 4 =	
UPL Species		x 5 =	
Column Totals:	100 (A)		160 (B)

Prevalence Index = B/A: 1.6

Hydrophytic Vegetation Indicators:

- [X] Dominance Test is > 50%
- [X] Prevalence Index is <= 3.0 (1)
- [ ] Morphological Adaptations (1) (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation (1) (Explain)

(1) Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? Yes X No

Remarks:

SOIL

Sampling Point: **A-08**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Horizon	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Abundance/Contrast	Redox Features Type (1)	Redox Features Loc (2)	Texture	Remarks
0-10	A	10YR 3/1	100	NA					clayey loam	
10-15	A	10YR 3/2	100	NA					clayey	subangular blocky

(1) Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or coated Sand Grains.

(2) Location: PL= Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

	Histosol (A1)		Sandy Gleyed Matrix (S4)
	Histic Epipedon (A2)		Sandy Redox (S5)
	Black Histic (A3)		Stripped Matrix (S6)
	Hydrogen Sulfide (A4)		Loamy Mucky Mineral (F1)
	Stratified Layers (A5)		Loamy Gleyed Matrix (F2)
	2 cm Muck (A10)		Depleted Matrix (F3)
	Depleted Below Dark Surface (A11)		Redox Dark Surface (F6)
X	Thick Dark Surface (A12)		Depleted Dark Surface (F7)
	Sandy Mucky Mineral (S1)		Redox Depressions (F8)
	5 cm Mucky Peat or Peat (S3)		

Indicators for Problematic Hydric Soils (3)

	Coast Prairie Redox (A16)
	Iron-Manganese Masses (F12)
	Other (Explain in Remarks)

(3) Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Clay

Depth (inches): 15+

Hydric Soil Present? Yes: X No:

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

X	Surface water (A1)		Water-stained leaves (B9)
	High water table (A2)		Aquatic Fauna (B13)
X	Saturation (A3)		True Aquatic Plants (B14)
	Water marks (B1)		Hydrogen sulfide odor (C1)
	Sediment deposits (B2)		Oxidized rhizospheres on living roots (C3)
	Drift deposits (B3)		Presence of reduced iron (C4)
	Algal mat or crust (B4)		Recent Iron Reduction in Tilled Soils (C6)
	Iron deposits (B5)		Thin muck surface (C7)
X	Inundation visible on aerial imagery (B7)		Gauge or Well Data (D9)
	Sparsely Vegetated Concave Surface (B8)		Other (explain in Remarks)

Secondary Indicators (minimum of two required)

	Surface soil cracks (B6)
X	Drainage patterns (B10)
	Dry-Season Water Table (C2)
	Crayfish burrows (C8)
X	Saturation visible on aerial imagery (C9)
	Stunted or Stressed Plants (D2)
	Geomorphic position (D2)
	FAC-neutral test (D5)
	Other (explain in Remarks)

Field Observations:

Surface Water Present?	Yes	X	No		Depth (inches)	
Water Table Present?	Yes	X	No		Depth (inches)	
Saturation Present? (includes capillary fringe)	Yes	X	No		Depth (inches)	

Wetland Hydrology Present? Yes: X No:

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: See attached aerial photo

Remarks: **Density/plasticity of clayey soil allowed limited infiltration into test hole. Surface water was approximately 5 ft from test hole and ~1+ ft deep.**

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site:	Lawrence Municipal Airport	City/County:	Lawrence / Douglas	Sampling Date:	10/8/2014
Applicant/Owner:	City of Lawrence	State:	KS	Sampling Point:	A-04
Investigator(s):	G.K. Behrens	Section, Township, Range:	S17, T12S, R20	Site ID	
Landform (hillslope, terrace, etc.):	Oxbow drainage	Local relief (concave, convex, none):	concave	Slope (%):	0-1
GPS: UTM	xxs xxxxxxxe xxxxxxxn	Lat:	39.015546	Long: -95.220945	Datum: WGS-84
Soil Map Unit Name:	Kimo Silty Clay loam	NWI classification:			

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ___ No X (If no, explain in Remarks.)

Are Vegetation N , Soil N , or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ___ No X

Are Vegetation N , Soil N , or Hydrology N naturally problematic? (If needed, explain answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	X	No		Is the Sampled Area within a Wetland? Yes X No
Hydric Soil Present?	Yes	X	No		
Wetland Hydrology Present?	Yes	X	No		

Remarks: **Drainage area has more water present than normal October. Drainage feature has been minimally impacted due to historic ag ops.**

VEGETATION - Use scientific names of plants.

		Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30ft radius)				
1	NA			
2				
3				
4				
			= Total Cover	
Sapling/Shrub Stratum (Plot Size: 15ft radius)				
1	Cephalanthus occidentalis (Common buttonbush)	25	Y	OBL
2				
3				
4				
5				
			= Total Cover	
Herb Stratum (Plot Size: 5ft radius)				
1	Alopecurus pratensis (Meadow foxtail)	20	Y	FACW
2	Carex aquatilis (Water sedge)	25	Y	OBL
3	Polygonum amphibium (Water smartweed)	25	Y	FACW
4	UNK	5		
5				
6				
7				
8				
9				
10				
		100	= Total Cover	
Woody Vine Stratum (Plot Size: 30ft radius)				
1	NA			
2				
			= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 95 (A/B)

Prevalence Index worksheet:

Total % Cover of:

OBL Species	50	x 1 =	50
FACW Species	45	x 2 =	90
FAC Species		x 3 =	
FACU Species		x 4 =	
UPL Species		x 5 =	
Column Totals:	95 (A)		140 (B)

Prevalence Index = B/A: 1.5

Hydrophytic Vegetation Indicators:

- X Dominance Test is > 50%
- X Prevalence Index is <= 3.0 (1)
- Morphological Adaptations (1) (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation (1) (Explain)

(1) Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? Yes X No

Remarks: **Only herbaceous / forb stratum present at this sample location.**

SOIL

Sampling Point: **A-04**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Horizon	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Abundance/Contrast	Redox Features Type (1)	Redox Features Loc (2)	Texture	Remarks
0-8	A	10YR 3/1	100	NA					clayey loam	
8-14	A	10YR 3/2	100	NA					clayey	subangular blocky

(1) Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or coated Sand Grains.

(2) Location: PL= Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

	Histosol (A1)		Sandy Gleyed Matrix (S4)
	Histic Epipedon (A2)		Sandy Redox (S5)
	Black Histic (A3)		Stripped Matrix (S6)
	Hydrogen Sulfide (A4)		Loamy Mucky Mineral (F1)
	Stratified Layers (A5)		Loamy Gleyed Matrix (F2)
	2 cm Muck (A10)		Depleted Matrix (F3)
	Depleted Below Dark Surface (A11)		Redox Dark Surface (F6)
X	Thick Dark Surface (A12)		Depleted Dark Surface (F7)
	Sandy Mucky Mineral (S1)		Redox Depressions (F8)
	5 cm Mucky Peat or Peat (S3)		

Indicators for Problematic Hydric Soils (3)

	Coast Prairie Redox (A16)
	Iron-Manganese Masses (F12)
	Other (Explain in Remarks)

(3) Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Clay

Depth (inches): 14+

Hydric Soil Present? Yes: X No:

Remarks: **Able to form 4" ribbon between fingers**

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

X	Surface water (A1)		Water-stained leaves (B9)
	High water table (A2)		Aquatic Fauna (B13)
X	Saturation (A3)		True Aquatic Plants (B14)
	Water marks (B1)		Hydrogen sulfide odor (C1)
	Sediment deposits (B2)		Oxidized rhizospheres on living roots (C3)
	Drift deposits (B3)		Presence of reduced iron (C4)
	Algal mat or crust (B4)		Recent Iron Reduction in Tilled Soils (C6)
	Iron deposits (B5)		Thin muck surface (C7)
X	Inundation visible on aerial imagery (B7)		Gauge or Well Data (D9)
	Sparsely Vegetated Concave Surface (B8)		Other (explain in Remarks)

Secondary Indicators (minimum of two required)

	Surface soil cracks (B6)
X	Drainage patterns (B10)
	Dry-Season Water Table (C2)
	Crayfish burrows (C8)
X	Saturation visible on aerial imagery (C9)
	Stunted or Stressed Plants (D2)
	Geomorphic position (D2)
	FAC-neutral test (D5)
	Other (explain in Remarks)

Field Observations:

Surface Water Present?	Yes	X	No		Depth (inches)	
Water Table Present?	Yes	X	No		Depth (inches)	
Saturation Present? (includes capillary fringe)	Yes	X	No		Depth (inches)	

Wetland Hydrology Present? Yes: X No:

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: See attached aerial photo

Remarks: **Density/plasticity of clayey soil allowed limited infiltration into test hole. Surface water was approximately 7 ft from test hole and ~1+ ft deep.**

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site:	Lawrence Municipal Airport	City/County:	Lawrence / Douglas	Sampling Date:	10/8/2014
Applicant/Owner:	City of Lawrence	State:	KS	Sampling Point:	A-15
Investigator(s):	G.K. Behrens	Section, Township, Range:	S17, T12S, R20	Site ID	
Landform (hillslope, terrace, etc.):	Oxbow drainage	Local relief (concave, convex, none):	concave	Slope (%):	0-1
GPS: UTM	xxs xxxxxxxe xxxxxxxn	Lat:	39.010521	Long: -95.218801	Datum: WGS-84
Soil Map Unit Name:	Kimo Silty Clay loam	NWI classification:			

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ___ No X (If no, explain in Remarks.)

Are Vegetation N , Soil N , or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ___ No X

Are Vegetation N , Soil N , or Hydrology N naturally problematic? (If needed, explain answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	X	No		Is the Sampled Area within a Wetland? Yes X No ___
Hydric Soil Present?	Yes	X	No		
Wetland Hydrology Present?	Yes	X	No		

Remarks: **Drainage area has significantly more water present than normal October levels.**

VEGETATION - Use scientific names of plants.

		Absolute % Cover	Dominant Species?	Indicator Status
	Tree Stratum (Plot size: 30ft radius)			
1	Salix nigra (Black willow)	15	Y	OBL
2				
3				
4				
		15	= Total Cover	
	Sapling/Shrub Stratum (Plot Size: 15ft radius)			
1	Cephalanthus occidentalis (Common buttonbush)	20	Y	OBL
2	Ulmus americana (American elm)	5	Y	FACW
3				
4				
5				
			= Total Cover	
	Herb Stratum (Plot Size: 5ft radius)			
1	Alopecurus pratensis (Meadow foxtail)	20	Y	FACW
2	Polygonum amphibium (Water smartweed)	25	Y	FACW
3	Carex aquatilis (Water sedge)	10	Y	OBL
4				
5				
6				
7				
8				
9				
10				
			= Total Cover	
	Woody Vine Stratum (Plot Size: 30ft radius)			
1	Smilax herbacea (Smooth carrion flower)	5	Y	FAC
2				
		5	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 95 (A/B)

Prevalence Index worksheet:

Total % Cover of:

OBL Species	45	x 1 =	45
FACW Species	50	x 2 =	100
FAC Species	5	x 3 =	15
FACU Species		x 4 =	
UPL Species		x 5 =	
Column Totals:	100 (A)		160 (B)

Prevalence Index = B/A: 1.6

Hydrophytic Vegetation Indicators:

- X Dominance Test is > 50%
- X Prevalence Index is <= 3.0 (1)
- ___ Morphological Adaptations (1) (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation (1) (Explain)

(1) Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? Yes X No ___

Remarks:

SOIL

Sampling Point: **A-15**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Horizon	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Abundance/Contrast	Redox Features Type (1)	Redox Features Loc (2)	Texture	Remarks
0-12	A	10YR 4/1	100	NA					clayey	

(1) Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or coated Sand Grains.

(2) Location: PL= Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

	Histosol (A1)		Sandy Gleyed Matrix (S4)
	Histic Epipedon (A2)		Sandy Redox (S5)
	Black Histic (A3)		Stripped Matrix (S6)
	Hydrogen Sulfide (A4)		Loamy Mucky Mineral (F1)
	Stratified Layers (A5)		Loamy Gleyed Matrix (F2)
	2 cm Muck (A10)		Depleted Matrix (F3)
	Depleted Below Dark Surface (A11)		Redox Dark Surface (F6)
X	Thick Dark Surface (A12)		Depleted Dark Surface (F7)
	Sandy Mucky Mineral (S1)		Redox Depressions (F8)
	5 cm Mucky Peat or Peat (S3)		

Indicators for Problematic Hydric Soils (3)

	Coast Prairie Redox (A16)
	Iron-Manganese Masses (F12)
	Other (Explain in Remarks)

(3) Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Clay

Depth (inches): 12+

Hydric Soil Present? Yes: X No:

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

X	Surface water (A1)		Water-stained leaves (B9)
	High water table (A2)		Aquatic Fauna (B13)
X	Saturation (A3)		True Aquatic Plants (B14)
	Water marks (B1)		Hydrogen sulfide odor (C1)
	Sediment deposits (B2)		Oxidized rhizospheres on living roots (C3)
	Drift deposits (B3)		Presence of reduced iron (C4)
	Algal mat or crust (B4)		Recent Iron Reduction in Tilled Soils (C6)
	Iron deposits (B5)		Thin muck surface (C7)
X	Inundation visible on aerial imagery (B7)		Gauge or Well Data (D9)
	Sparsely Vegetated Concave Surface (B8)		Other (explain in Remarks)

Secondary Indicators (minimum of two required)

	Surface soil cracks (B6)
X	Drainage patterns (B10)
	Dry-Season Water Table (C2)
	Crayfish burrows (C8)
X	Saturation visible on aerial imagery (C9)
	Stunted or Stressed Plants (D2)
	Geomorphic position (D2)
	FAC-neutral test (D5)
	Other (explain in Remarks)

Field Observations:

Surface Water Present?	Yes	X	No		Depth (inches)	
Water Table Present?	Yes	X	No		Depth (inches)	
Saturation Present? (includes capillary fringe)	Yes	X	No		Depth (inches)	

Wetland Hydrology Present? Yes: X No:

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: See attached aerial photo

Remarks: **Density/plasticity of clayey soil allowed limited infiltration into test hole. Surface water was approximately 8 ft from test hole and ~1+ ft deep.**

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site:	Lawrence Municipal Airport	City/County:	Lawrence / Douglas	Sampling Date:	10/8/2014
Applicant/Owner:	City of Lawrence	State:	KS	Sampling Point:	B-01
Investigator(s):	G.K. Behrens	Section, Township, Range:	S17, T12S, R20	Site ID	
Landform (hillslope, terrace, etc.):	Intermittent drainage channel	Local relief (concave, convex, none):	concave	Slope (%):	0-1
GPS: UTM	xxs xxxxxxxe xxxxxxxn	Lat:	39.002212	Long: -95.216276	Datum: WGS-84
Soil Map Unit Name:	Kimo Silty Clay loam	NWI classification:			

Are climatic / hydrologic conditions on the site typical for this time of year? Yes [ ] No [X] (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes [ ] No [X]

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	X	No		Is the Sampled Area within a Wetland? Yes X No
Hydric Soil Present?	Yes	X	No		
Wetland Hydrology Present?	Yes	X	No		

Remarks: **Drainage area has significantly more water present than normal October levels.**

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30ft radius)			
1 NA			
2			
3			
4			
	= Total Cover		
Sapling/Shrub Stratum (Plot Size: 15ft radius)			
1 NA			
2			
3			
4			
5			
	= Total Cover		
Herb Stratum (Plot Size: 5ft radius)			
1 Alopecurus pratensis (Meadow foxtail)	30	Y	FACW
2 Polygonum amphibium (Water smartweed)	30	Y	FACW
3 Carex aquatilis (Water sedge)	35	Y	OBL
4 UNK	5		
5			
6			
7			
8			
9			
10			
	100	= Total Cover	
Woody Vine Stratum (Plot Size: 30ft radius)			
1 NA			
2			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC	95	(A/B)

Prevalence Index worksheet:

Total % Cover of:			
OBL Species	35	x 1 =	35
FACW Species	60	x 2 =	120
FAC Species		x 3 =	
FACU Species		x 4 =	
UPL Species		x 5 =	
Column Totals:	95 (A)		155 (B)

Prevalence Index = B/A: 1.63

Hydrophytic Vegetation Indicators:

- [X] Dominance Test is > 50%
- [X] Prevalence Index is <= 3.0 (1)
- [ ] Morphological Adaptations (1) (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation (1) (Explain)

(1) Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? Yes [X] No [ ]

Remarks:

SOIL

Sampling Point: **B-01**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Horizon	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Abundance/Contrast	Redox Features Type (1)	Redox Features Loc (2)	Texture	Remarks
0-10	A	10YR 3/1	100	NA					clayey loam	

(1) Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or coated Sand Grains.

(2) Location: PL= Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

	Histosol (A1)		Sandy Gleyed Matrix (S4)
	Histic Epipedon (A2)		Sandy Redox (S5)
	Black Histic (A3)		Stripped Matrix (S6)
	Hydrogen Sulfide (A4)		Loamy Mucky Mineral (F1)
	Stratified Layers (A5)		Loamy Gleyed Matrix (F2)
	2 cm Muck (A10)		Depleted Matrix (F3)
	Depleted Below Dark Surface (A11)		Redox Dark Surface (F6)
X	Thick Dark Surface (A12)		Depleted Dark Surface (F7)
	Sandy Mucky Mineral (S1)		Redox Depressions (F8)
	5 cm Mucky Peat or Peat (S3)		

Indicators for Problematic Hydric Soils (3)

	Coast Prairie Redox (A16)
	Iron-Manganese Masses (F12)
	Other (Explain in Remarks)

(3) Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Clay

Depth (inches): 10+

Hydric Soil Present? Yes: X No:

Remarks: **Shovel refusal at 10".**

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

X	Surface water (A1)		Water-stained leaves (B9)
	High water table (A2)		Aquatic Fauna (B13)
X	Saturation (A3)		True Aquatic Plants (B14)
	Water marks (B1)		Hydrogen sulfide odor (C1)
	Sediment deposits (B2)		Oxidized rhizospheres on living roots (C3)
	Drift deposits (B3)		Presence of reduced iron (C4)
	Algal mat or crust (B4)		Recent Iron Reduction in Tilled Soils (C6)
	Iron deposits (B5)		Thin muck surface (C7)
X	Inundation visible on aerial imagery (B7)		Gauge or Well Data (D9)
	Sparsely Vegetated Concave Surface (B8)		Other (explain in Remarks)

Secondary Indicators (minimum of two required)

	Surface soil cracks (B6)
X	Drainage patterns (B10)
	Dry-Season Water Table (C2)
	Crayfish burrows (C8)
X	Saturation visible on aerial imagery (C9)
	Stunted or Stressed Plants (D2)
	Geomorphic position (D2)
	FAC-neutral test (D5)
	Other (explain in Remarks)

Field Observations:

Surface Water Present?	Yes	X	No		Depth (inches)	
Water Table Present?	Yes	X	No		Depth (inches)	
Saturation Present? (includes capillary fringe)	Yes	X	No		Depth (inches)	

Wetland Hydrology Present? Yes: X No:

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: See attached aerial photo

Remarks: **Density/plasticity of clayey soil allowed limited infiltration into test hole. Surface water was approximately 4 ft from test hole and ~1+ ft deep.**

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site:	Lawrence Municipal Airport	City/County:	Lawrence / Douglas	Sampling Date:	10/8/2014
Applicant/Owner:	City of Lawrence	State:	KS	Sampling Point:	B-05
Investigator(s):	G.K. Behrens	Section, Township, Range:	S17, T12S, R20	Site ID	
Landform (hillslope, terrace, etc.):	Intermittent drainage channel	Local relief (concave, convex, none):	concave	Slope (%):	0-1
GPS: UTM	xxs xxxxxxxe xxxxxxxn	Lat:	39.001322	Long: -95.218067	Datum: WGS-84
Soil Map Unit Name:	Kimo Silty Clay loam			NWI classification:	

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ___ No X (If no, explain in Remarks.)

Are Vegetation N , Soil N , or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ___ No X

Are Vegetation N , Soil N , or Hydrology N naturally problematic? (If needed, explain answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	X	No		Is the Sampled Area within a Wetland? Yes X No
Hydric Soil Present?	Yes	X	No		
Wetland Hydrology Present?	Yes	X	No		

Remarks: **Drainage area has significantly more water present than normal October levels.**

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30ft radius)			
1 NA			
2			
3			
4			
	= Total Cover		
Sapling/Shrub Stratum (Plot Size: 15ft radius)			
1 NA			
2			
3			
4			
5			
	= Total Cover		
Herb Stratum (Plot Size: 5ft radius)			
1 Alopecurus pratensis (Meadow foxtail)	25	Y	FACW
2 Polygonum amphibium (Water smartweed)	35	Y	FACW
3 Carex aquatilis (Water sedge)	35	Y	OBL
4 UNK	5		
5			
6			
7			
8			
9			
10			
	100 = Total Cover		
Woody Vine Stratum (Plot Size: 30ft radius)			
1 NA			
2			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC	95	(A/B)

Prevalence Index worksheet:

Total % Cover of:

OBL Species	35	x 1 =	35
FACW Species	60	x 2 =	120
FAC Species		x 3 =	
FACU Species		x 4 =	
UPL Species		x 5 =	
Column Totals:	95 (A)		155 (B)

Prevalence Index = B/A: 1.63

Hydrophytic Vegetation Indicators:

- X Dominance Test is > 50%
- X Prevalence Index is <= 3.0 (1)
- Morphological Adaptations (1) (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation (1) (Explain)

(1) Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? Yes X No

Remarks:

SOIL

Sampling Point: **B-05**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Horizon	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Abundance/Contrast	Redox Features Type (1)	Redox Features Loc (2)	Texture	Remarks
0-12	A	10YR 3/1	100	NA					clayey loam	

(1) Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or coated Sand Grains.

(2) Location: PL= Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

	Histosol (A1)		Sandy Gleyed Matrix (S4)
	Histic Epipedon (A2)		Sandy Redox (S5)
	Black Histic (A3)		Stripped Matrix (S6)
	Hydrogen Sulfide (A4)		Loamy Mucky Mineral (F1)
	Stratified Layers (A5)		Loamy Gleyed Matrix (F2)
	2 cm Muck (A10)		Depleted Matrix (F3)
	Depleted Below Dark Surface (A11)		Redox Dark Surface (F6)
X	Thick Dark Surface (A12)		Depleted Dark Surface (F7)
	Sandy Mucky Mineral (S1)		Redox Depressions (F8)
	5 cm Mucky Peat or Peat (S3)		

Indicators for Problematic Hydric Soils (3)

	Coast Prairie Redox (A16)
	Iron-Manganese Masses (F12)
	Other (Explain in Remarks)

(3) Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Clay

Depth (inches): 12+

Hydric Soil Present? Yes: X No:

Remarks: **Shovel refusal at 12".**

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

X	Surface water (A1)		Water-stained leaves (B9)
	High water table (A2)		Aquatic Fauna (B13)
X	Saturation (A3)		True Aquatic Plants (B14)
	Water marks (B1)		Hydrogen sulfide odor (C1)
	Sediment deposits (B2)		Oxidized rhizospheres on living roots (C3)
	Drift deposits (B3)		Presence of reduced iron (C4)
	Algal mat or crust (B4)		Recent Iron Reduction in Tilled Soils (C6)
	Iron deposits (B5)		Thin muck surface (C7)
X	Inundation visible on aerial imagery (B7)		Gauge or Well Data (D9)
	Sparsely Vegetated Concave Surface (B8)		Other (explain in Remarks)

Secondary Indicators (minimum of two required)

	Surface soil cracks (B6)
X	Drainage patterns (B10)
	Dry-Season Water Table (C2)
	Crayfish burrows (C8)
X	Saturation visible on aerial imagery (C9)
	Stunted or Stressed Plants (D2)
	Geomorphic position (D2)
	FAC-neutral test (D5)
	Other (explain in Remarks)

Field Observations:

Surface Water Present?	Yes	X	No		Depth (inches)	
Water Table Present?	Yes	X	No		Depth (inches)	
Saturation Present? (includes capillary fringe)	Yes	X	No		Depth (inches)	

Wetland Hydrology Present? Yes: X No:

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: See attached aerial photo

Remarks: **Density/plasticity of clayey soil allowed limited infiltration into test hole. Surface water was approximately 7 ft from test hole and ~1+ ft deep.**

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site:	Lawrence Municipal Airport	City/County:	Lawrence / Douglas	Sampling Date:	10/8/2014
Applicant/Owner:	City of Lawrence	State:	KS	Sampling Point:	B-13
Investigator(s):	G.K. Behrens	Section, Township, Range:	S17, T12S, R20	Site ID	
Landform (hillslope, terrace, etc.):	Intermittent drainage channel	Local relief (concave, convex, none):	concave	Slope (%):	0-1
GPS: UTM	xxs xxxxxxxe xxxxxxxn	Lat:	39.001654	Long: -95.216958	Datum: WGS-84
Soil Map Unit Name:	Kimo Silty Clay loam			NWI classification:	

Are climatic / hydrologic conditions on the site typical for this time of year? Yes [ ] No [X] (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes [ ] No [X]

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	X	No		Is the Sampled Area within a Wetland? Yes X No
Hydric Soil Present?	Yes	X	No		
Wetland Hydrology Present?	Yes	X	No		

Remarks: **Drainage area has significantly more water present than normal October levels.**

VEGETATION - Use scientific names of plants.

		Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30ft radius)				
1	NA			
2				
3				
4				
			= Total Cover	
Sapling/Shrub Stratum (Plot Size: 15ft radius)				
1	NA			
2				
3				
4				
5				
			= Total Cover	
Herb Stratum (Plot Size: 5ft radius)				
1	Alopecurus pratensis (Meadow foxtail)	25	Y	FACW
2	Polygonum amphibium (Water smartweed)	35	Y	FACW
3	Carex aquatilis (Water sedge)	25	Y	OBL
4	Schedonorus arundinaceus (Tall fescue)	15	N	FACU
5				
6				
7				
8				
9				
10				
		100	= Total Cover	
Woody Vine Stratum (Plot Size: 30ft radius)				
1	NA			
2				
			= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC	85	(A/B)

Prevalence Index worksheet:

Total % Cover of:

OBL Species	25	x 1 =	25
FACW Species	60	x 2 =	120
FAC Species		x 3 =	
FACU Species	15	x 4 =	60
UPL Species		x 5 =	
Column Totals:	100 (A)		205 (B)

Prevalence Index = B/A: 2.05

Hydrophytic Vegetation Indicators:

- [X] Dominance Test is > 50%
- [X] Prevalence Index is <= 3.0 (1)
- [ ] Morphological Adaptations (1) (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation (1) (Explain)

(1) Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? Yes X No

Remarks:

SOIL

Sampling Point: **B-13**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Horizon	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Abundance/Contrast	Redox Features Type (1)	Redox Features Loc (2)	Texture	Remarks
0-12	A	10YR 3/2	100	NA					clayey loam	

(1) Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or coated Sand Grains.

(2) Location: PL= Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

	Histosol (A1)		Sandy Gleyed Matrix (S4)
	Histic Epipedon (A2)		Sandy Redox (S5)
	Black Histic (A3)		Stripped Matrix (S6)
	Hydrogen Sulfide (A4)		Loamy Mucky Mineral (F1)
	Stratified Layers (A5)		Loamy Gleyed Matrix (F2)
	2 cm Muck (A10)		Depleted Matrix (F3)
	Depleted Below Dark Surface (A11)		Redox Dark Surface (F6)
X	Thick Dark Surface (A12)		Depleted Dark Surface (F7)
	Sandy Mucky Mineral (S1)		Redox Depressions (F8)
	5 cm Mucky Peat or Peat (S3)		

Indicators for Problematic Hydric Soils (3)

	Coast Prairie Redox (A16)
	Iron-Manganese Masses (F12)
	Other (Explain in Remarks)

(3) Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Clay

Depth (inches): 12+

Hydric Soil Present? Yes: X No:

Remarks: **Shovel refusal at 12".**

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

X	Surface water (A1)		Water-stained leaves (B9)
	High water table (A2)		Aquatic Fauna (B13)
X	Saturation (A3)		True Aquatic Plants (B14)
	Water marks (B1)		Hydrogen sulfide odor (C1)
	Sediment deposits (B2)		Oxidized rhizospheres on living roots (C3)
	Drift deposits (B3)		Presence of reduced iron (C4)
	Algal mat or crust (B4)		Recent Iron Reduction in Tilled Soils (C6)
	Iron deposits (B5)		Thin muck surface (C7)
X	Inundation visible on aerial imagery (B7)		Gauge or Well Data (D9)
	Sparsely Vegetated Concave Surface (B8)		Other (explain in Remarks)

Secondary Indicators (minimum of two required)

	Surface soil cracks (B6)
X	Drainage patterns (B10)
	Dry-Season Water Table (C2)
	Crayfish burrows (C8)
X	Saturation visible on aerial imagery (C9)
	Stunted or Stressed Plants (D2)
	Geomorphic position (D2)
	FAC-neutral test (D5)
	Other (explain in Remarks)

Field Observations:

Surface Water Present?	Yes	X	No		Depth (inches)	
Water Table Present?	Yes	X	No		Depth (inches)	
Saturation Present? (includes capillary fringe)	Yes	X	No		Depth (inches)	

Wetland Hydrology Present? Yes: X No:

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: See attached aerial photo

Remarks: **Density/plasticity of clayey soil allowed limited infiltration into test hole. Surface water was approximately 20 ft from test hole and ~1+ ft deep.**

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site:	Lawrence Municipal Airport	City/County:	Lawrence / Douglas	Sampling Date:	10/8/2014
Applicant/Owner:	City of Lawrence	State:	KS	Sampling Point:	C-01
Investigator(s):	G.K. Behrens	Section, Township, Range:	S17, T12S, R20	Site ID	
Landform (hillslope, terrace, etc.):	Intermittent drainage channel	Local relief (concave, convex, none):	concave	Slope (%):	0-1
GPS: UTM	xxs xxxxxxxe xxxxxxxn	Lat:	39.002319	Long: -95.215881	Datum: WGS-84
Soil Map Unit Name:	Kimo Silty Clay loam	NWI classification:			

Are climatic / hydrologic conditions on the site typical for this time of year? Yes [ ] No [X] (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes [ ] No [X]

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	X	No		Is the Sampled Area within a Wetland? Yes X No
Hydric Soil Present?	Yes	X	No		
Wetland Hydrology Present?	Yes	X	No		

Remarks: **Drainage area has significantly more water present than normal October levels.**

VEGETATION - Use scientific names of plants.

		Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30ft radius)				
1	NA			
2				
3				
4				
			= Total Cover	
Sapling/Shrub Stratum (Plot Size: 15ft radius)				
1	NA			
2				
3				
4				
5				
			= Total Cover	
Herb Stratum (Plot Size: 5ft radius)				
1	Alopecurus pratensis (Meadow foxtail)	25	Y	FACW
2	Polygonum amphibium (Water smartweed)	30	Y	FACW
3	Carex aquatilis (Water sedge)	25	Y	OBL
4	Schedonorus arundinaceus (Tall fescue)	20	N	FACU
5				
6				
7				
8				
9				
10				
		100	= Total Cover	
Woody Vine Stratum (Plot Size: 30ft radius)				
1	NA			
2				
			= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC	85	(A/B)

Prevalence Index worksheet:

Total % Cover of:

OBL Species	25	x 1 =	25
FACW Species	55	x 2 =	110
FAC Species		x 3 =	
FACU Species	20	x 4 =	80
UPL Species		x 5 =	
Column Totals:	100 (A)		215 (B)

Prevalence Index = B/A: 2.15

Hydrophytic Vegetation Indicators:

- [X] Dominance Test is > 50%
- [X] Prevalence Index is <= 3.0 (1)
- [ ] Morphological Adaptations (1) (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation (1) (Explain)

(1) Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? Yes X No

Remarks:

SOIL

Sampling Point: **C-01**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Horizon	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Abundance/Contrast	Redox Features Type (1)	Redox Features Loc (2)	Texture	Remarks
0-12	A	10YR 4/1	90	7.5YR 4/4	10	Faint	C	PL	clayey loam	

(1) Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or coated Sand Grains.

(2) Location: PL= Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

	Histosol (A1)		Sandy Gleyed Matrix (S4)
	Histic Epipedon (A2)		Sandy Redox (S5)
	Black Histic (A3)		Stripped Matrix (S6)
	Hydrogen Sulfide (A4)		Loamy Mucky Mineral (F1)
	Stratified Layers (A5)		Loamy Gleyed Matrix (F2)
	2 cm Muck (A10)		Depleted Matrix (F3)
	Depleted Below Dark Surface (A11)		Redox Dark Surface (F6)
X	Thick Dark Surface (A12)		Depleted Dark Surface (F7)
	Sandy Mucky Mineral (S1)	X	Redox Depressions (F8)
	5 cm Mucky Peat or Peat (S3)		

Indicators for Problematic Hydric Soils (3)

	Coast Prairie Redox (A16)
	Iron-Manganese Masses (F12)
	Other (Explain in Remarks)

(3) Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Clay

Depth (inches): 12+

Hydric Soil Present? Yes: X No:

Remarks: **Shovel refusal at 12".**

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

X	Surface water (A1)		Water-stained leaves (B9)
	High water table (A2)		Aquatic Fauna (B13)
X	Saturation (A3)		True Aquatic Plants (B14)
	Water marks (B1)		Hydrogen sulfide odor (C1)
	Sediment deposits (B2)		Oxidized rhizospheres on living roots (C3)
	Drift deposits (B3)		Presence of reduced iron (C4)
	Algal mat or crust (B4)		Recent Iron Reduction in Tilled Soils (C6)
	Iron deposits (B5)		Thin muck surface (C7)
X	Inundation visible on aerial imagery (B7)		Gauge or Well Data (D9)
	Sparsely Vegetated Concave Surface (B8)		Other (explain in Remarks)

Secondary Indicators (minimum of two required)

	Surface soil cracks (B6)
X	Drainage patterns (B10)
	Dry-Season Water Table (C2)
	Crayfish burrows (C8)
X	Saturation visible on aerial imagery (C9)
	Stunted or Stressed Plants (D2)
	Geomorphic position (D2)
	FAC-neutral test (D5)
	Other (explain in Remarks)

Field Observations:

Surface Water Present?	Yes	X	No		Depth (inches)	
Water Table Present?	Yes	X	No		Depth (inches)	
Saturation Present? (includes capillary fringe)	Yes	X	No		Depth (inches)	

Wetland Hydrology Present? Yes: X No:

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: See attached aerial photo

Remarks: **Density/plasticity of clayey soil allowed limited infiltration into test hole. Surface water was approximately 15 ft from test hole and ~1+ ft deep.**

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site:	Lawrence Municipal Airport	City/County:	Lawrence / Douglas	Sampling Date:	10/8/2014
Applicant/Owner:	City of Lawrence	State:	KS	Sampling Point:	C-18
Investigator(s):	G.K. Behrens	Section, Township, Range:	S17, T12S, R20	Site ID	
Landform (hillslope, terrace, etc.):	Intermittent drainage channel	Local relief (concave, convex, none):	concave	Slope (%):	0-1
GPS: UTM	xxs xxxxxxxe xxxxxxxn	Lat:	39.002803	Long: -95.212706	Datum: WGS-84
Soil Map Unit Name:	Kimo Silty Clay loam			NWI classification:	

Are climatic / hydrologic conditions on the site typical for this time of year? Yes [ ] No [X] (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes [ ] No [X]

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	X	No		
Hydric Soil Present?	Yes	X	No		
Wetland Hydrology Present?	Yes	X	No		

Is the Sampled Area within a Wetland? Yes [X] No [ ]

Remarks: **Drainage area has significantly more water present than normal October levels.**

VEGETATION - Use scientific names of plants.

		Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30ft radius)				
1	NA			
2				
3				
4				
			= Total Cover	
Sapling/Shrub Stratum (Plot Size: 15ft radius)				
1	NA			
2				
3				
4				
5				
			= Total Cover	
Herb Stratum (Plot Size: 5ft radius)				
1	Alopecurus pratensis (Meadow foxtail)	30	Y	FACW
2	Polygonum amphibium (Water smartweed)	30	Y	FACW
3	Carex aquatilis (Water sedge)	20	Y	OBL
4	Schedonorus arundinaceus (Tall fescue)	20	N	FACU
5				
6				
7				
8				
9				
10				
		100	= Total Cover	
Woody Vine Stratum (Plot Size: 30ft radius)				
1	NA			
2				
			= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC	85	(A/B)

Prevalence Index worksheet:

Total % Cover of:

OBL Species	20	x 1 =	20
FACW Species	60	x 2 =	120
FAC Species		x 3 =	
FACU Species	20	x 4 =	80
UPL Species		x 5 =	
Column Totals:	100 (A)		220 (B)

Prevalence Index = B/A: 2.2

Hydrophytic Vegetation Indicators:

X	Dominance Test is > 50%
X	Prevalence Index is <= 3.0 (1)
	Morphological Adaptations (1) (Provide supporting data in Remarks or on a separate sheet)
	Problematic Hydrophytic Vegetation (1) (Explain)

(1) Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? Yes [X] No [ ]

Remarks:

SOIL

Sampling Point: C-18

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Horizon	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Abundance/Contrast	Redox Features Type (1)	Redox Features Loc (2)	Texture	Remarks
0-14	A	10YR 4/1	85	7.5YR 4/4	15	Faint	C	PL	clayey loam	

(1) Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or coated Sand Grains.

(2) Location: PL= Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

	Histosol (A1)		Sandy Gleyed Matrix (S4)
	Histic Epipedon (A2)		Sandy Redox (S5)
	Black Histic (A3)		Stripped Matrix (S6)
	Hydrogen Sulfide (A4)		Loamy Mucky Mineral (F1)
	Stratified Layers (A5)		Loamy Gleyed Matrix (F2)
	2 cm Muck (A10)		Depleted Matrix (F3)
	Depleted Below Dark Surface (A11)		Redox Dark Surface (F6)
X	Thick Dark Surface (A12)		Depleted Dark Surface (F7)
	Sandy Mucky Mineral (S1)	X	Redox Depressions (F8)
	5 cm Mucky Peat or Peat (S3)		

Indicators for Problematic Hydric Soils (3)

	Coast Prairie Redox (A16)
	Iron-Manganese Masses (F12)
	Other (Explain in Remarks)

(3) Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Clay

Depth (inches): 14+

Hydric Soil Present? Yes: X No:

Remarks: **Shovel refusal at 14".**

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

X	Surface water (A1)		Water-stained leaves (B9)
	High water table (A2)		Aquatic Fauna (B13)
X	Saturation (A3)		True Aquatic Plants (B14)
	Water marks (B1)		Hydrogen sulfide odor (C1)
	Sediment deposits (B2)		Oxidized rhizospheres on living roots (C3)
	Drift deposits (B3)		Presence of reduced iron (C4)
	Algal mat or crust (B4)		Recent Iron Reduction in Tilled Soils (C6)
	Iron deposits (B5)		Thin muck surface (C7)
X	Inundation visible on aerial imagery (B7)		Gauge or Well Data (D9)
	Sparsely Vegetated Concave Surface (B8)		Other (explain in Remarks)

Secondary Indicators (minimum of two required)

	Surface soil cracks (B6)
X	Drainage patterns (B10)
	Dry-Season Water Table (C2)
	Crayfish burrows (C8)
X	Saturation visible on aerial imagery (C9)
	Stunted or Stressed Plants (D2)
	Geomorphic position (D2)
	FAC-neutral test (D5)
	Other (explain in Remarks)

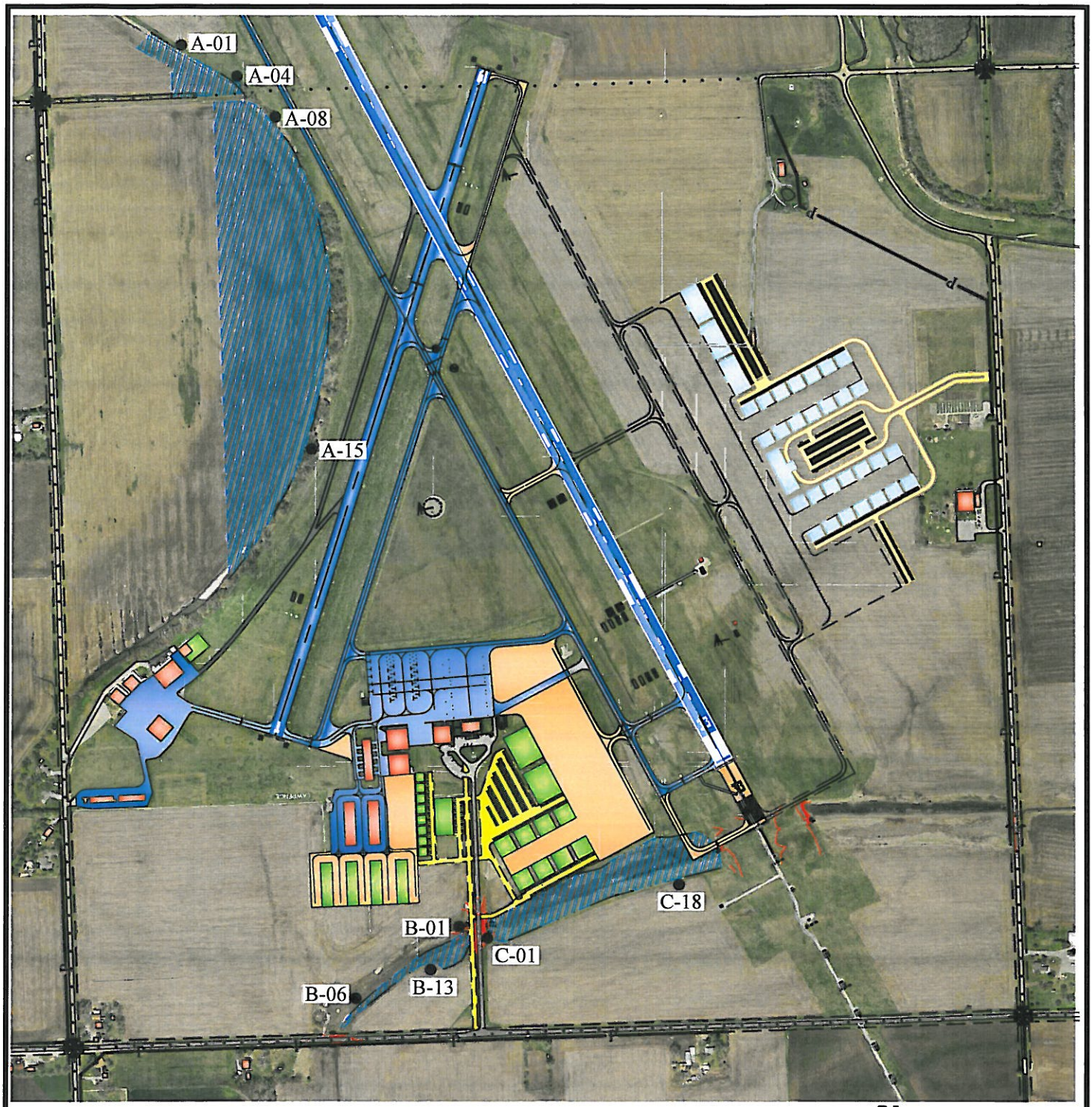
Field Observations:

Surface Water Present?	Yes	X	No		Depth (inches)	
Water Table Present?	Yes	X	No		Depth (inches)	
Saturation Present? (includes capillary fringe)	Yes	X	No		Depth (inches)	

Wetland Hydrology Present? Yes: X No:

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: See attached aerial photo

Remarks: **Density/plasticity of clayey soil allowed limited infiltration into test hole. Surface water was approximately 10 ft from test hole and ~1+ ft deep.**



Legend

Area Surveyed As Wetlands

N

Graphic Scale

400 0 200 400 800 1600

(Feet)

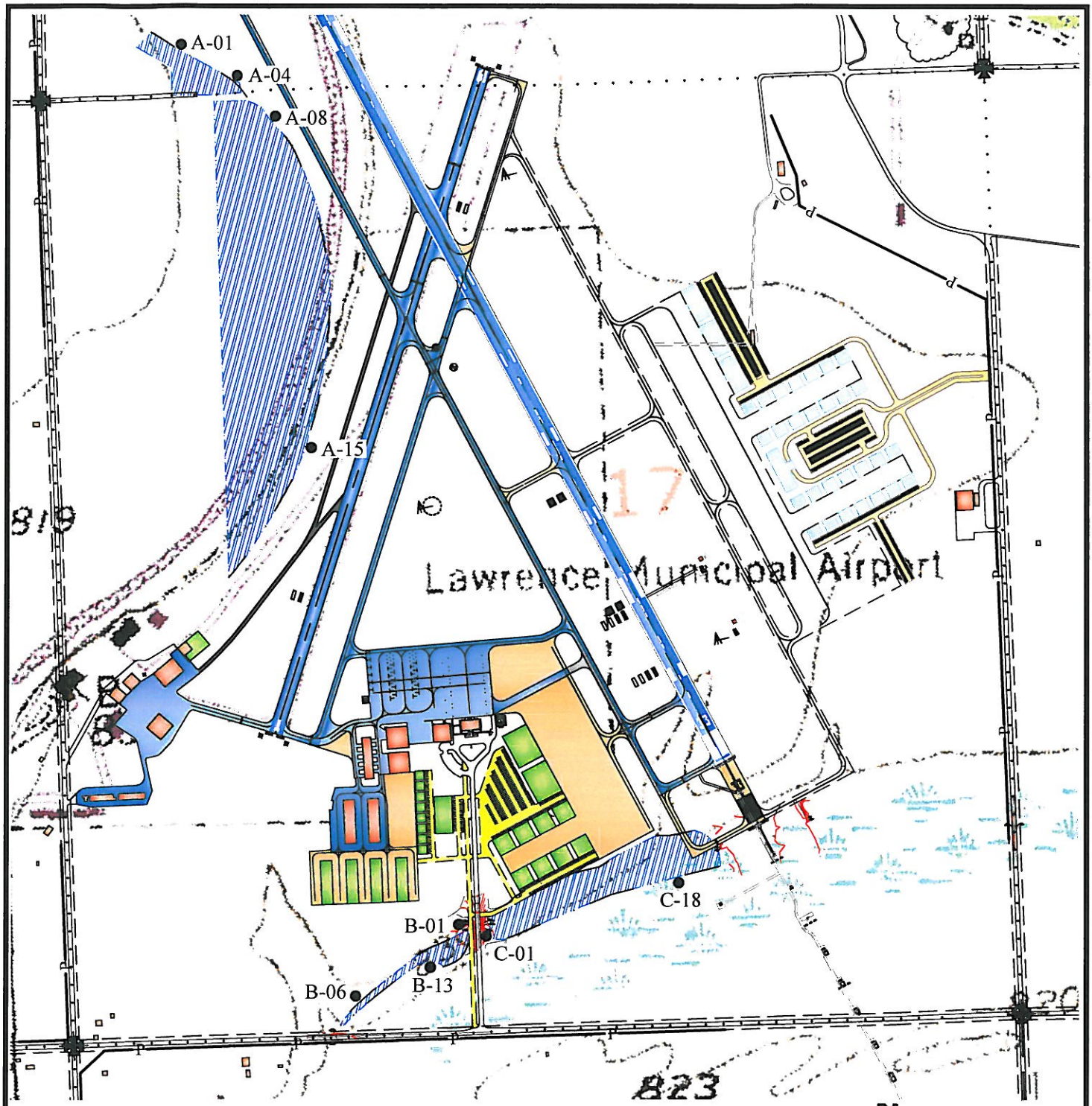
Lawrence Municipal Airport
Wetlands Survey

Douglas County, KS

ADG AIRPORT DEVELOPMENT GROUP INC
3900 Lakeland Drive / Suite 501 C
Jackson, Mississippi 39232
601.932.6920 / 601.932.6901 fax
www.ADGAirports.com

Project No: LWC1451
Date: October, 2014

Sheet: 1 of 2 Sheets



Lawrence Municipal Airport
Wetlands Survey

Douglas County, KS

ADG AIRPORT DEVELOPMENT GROUP INC.
3900 Lakeland Drive / Suite 501 C
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Date: October, 2014

Sheet: 2 of 2 Sheets

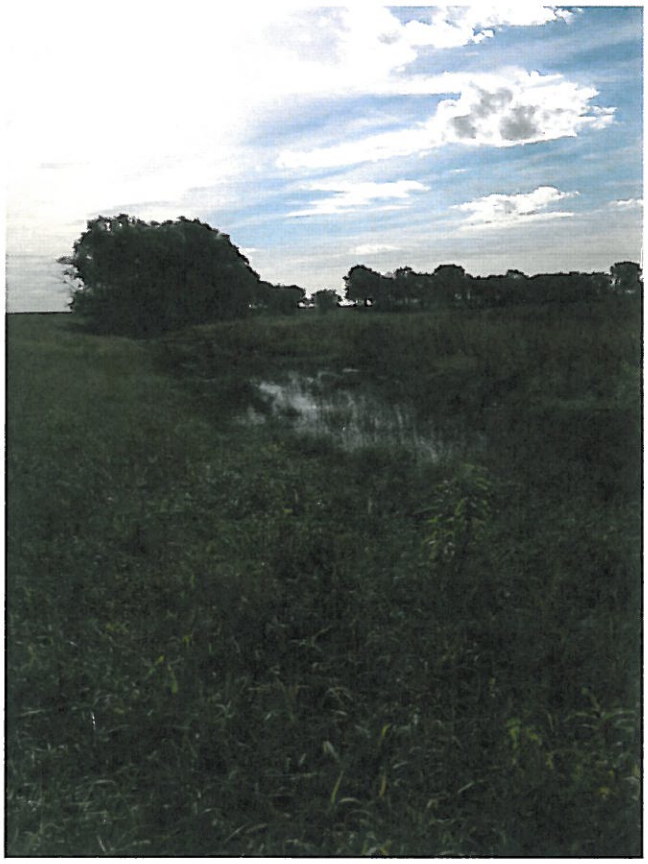


Photo 1: Polygon A drainage looking south toward crosswind runway

Photo 2: Kimo series soil from A-01, thick dark surface indicator

Photo 3: Polygon A, oxbow drainage, looking SSW

Photo 4: Common buttonbush *(Cephalanthus occidentalis)* along edge of drainage in polygon A.

Photo 5: Polygon B area beyond the rip/rap drainage

Photo 6: Example of Kimo series soil with thick dark surface indicator, Polygon B

Photo 7: Polygon C area looking east from Airport Rd., water sedge, meadow foxtail and Polygonum are dominant. K31 fescue is also present near field edges.

Photo 8: Kimo series soil in polygon c is consistent with other areas sampled.


500 Rd
E 1600 Rd
7050
N 1900th Rd
7155
N 1900 Rd
N 1950 Rd
Mud Creek
7176
7106
7155
E 1500 Rd
Airport Rd
7213
24
Highway 40
N 7th St
9 Doug
7155
7106

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Douglas County, Kansas
Survey Area Data: Version 10, Dec 5, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 3, 2010—Feb 25, 2012

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Douglas County, Kansas (KS045)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
7050	Kennebec silt loam, occasionally flooded	53.5	10.4%
7106	Eudora-Bismarckgrove silt loams, rarely flooded	39.4	7.7%
7155	Kimo silty clay loam, rarely flooded	86.6	16.8%
7176	Rossville silt loam, very rarely flooded	252.1	49.0%
7213	Reading silt loam, moderately wet, very rarely flooded	82.9	16.1%
Totals for Area of Interest		**514.4**	**100.0%**

KIMO SERIES

The Kimo series consists of very deep, somewhat poorly drained, soils old channels on flood plain steps. They formed in clayey over loamy alluvium. Slopes range from 0 to 1 percent. Mean annual temperature is 12 degrees C. (54 degree F.)

TAXONOMIC CLASS: Clayey over loamy, smectitic, mesic Fluvaquentic Hapludolls

TYPICAL PEDON: Kimo silty clay loam - cultivated. (Colors are for moist soil unless otherwise stated.)

Ap--0 to 18 centimeters (0 to 7 inches); very dark gray (10YR 3/1) silty clay loam, dark gray (10YR 4/1) dry; weak fine granular structure; hard, firm, sticky and plastic; moderately alkaline; abrupt smooth boundary.

A1--18 to 38centimeters (7 to 15 inches); very dark grayish brown (10YR 3/2) silty clay, grayish brown (10YR 5/2) dry; weak medium subangular blocky structure; very hard, very firm, very sticky and very plastic; neutral; gradual smooth boundary.

A2--38 to 58 centimeters (15 to 23 inches); very dark grayish brown (10YR 3/2) silty clay loam, grayish brown (10YR 5/2) dry; weak medium subangular blocky structure; very hard, very firm, very sticky and very plastic; neutral; gradual smooth boundary. (Combined thickness of A horizons is 31 to 61 centimeters (12 to 24 inches.)

AC--58 to 69 centimeters (23 to 27 inches); dark grayish brown (10YR 4/2) and very dark grayish brown (10YR 3/2) silty clay loam, light brownish gray (10YR 6/2) and dark grayish brown (10YR 4/2) dry; common fine prominent strong brown (7.5YR 5/6) redoximorphic concentrations; weak fine subangular blocky structure; hard, firm, sticky and plastic; neutral; abrupt smooth boundary. (0 to 31 centimeters (0 to 12 inches thick)

2C1--69 to 107 centimeters (27 to 42 inches); grayish brown (10YR 5/2) silt loam, light brownish gray (10YR 6/2) dry; common fine prominent strong brown (7.5YR 5/6) redoximorphic concentrations; massive; soft, very friable, nonsticky and nonplastic; neutral; diffuse wavy boundary.

2C2--107 to 152 centimeters (42 to 60 inches); dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; thin strata of light gray (10YR 7/2) very fine sand; massive; soft, very friable, nonsticky and nonplastic; moderately alkaline.

TYPE LOCATION: Shawnee County, Kansas; about 4.5 miles west of Rossville; 774 meters (2,540 feet) west and 31 meters (100 feet) south of the northeast corner of sec. 36, T. 10 S., R. 12 E. USGS Rossville Topographic quadrangle lat. 39 degrees 04 minutes 16 seconds N. and long. 95 Degrees 34 minutes 50 seconds W.

DEPARTMENT OF THE ARMY
KANSAS CITY DISTRICT, CORPS OF ENGINEERS
635 FEDERAL BUILDING
601 E 12TH STREET
KANSAS CITY MO 64106-2824

REPLY TO
ATTENTION OF

March 5, 2015

Regulatory Branch
(NWK-2014-00673)

Mr. Steve Marshall
Airport Development Group, Inc.
1776 South Jackson Street, Suite 950
Denver, Colorado 80210-3808

Dear Mr. Marshall:

This letter is in response to the request you submitted on behalf of Lawrence Municipal Airport for a Jurisdictional Determination for airport safety improvements. It was received on January 5, 2015. The project is located in Section 17, Township 12 South, Range 20 East, Lawrence, Douglas County, Kansas. Your request has been assigned Regulatory File No. NWK-2014-00673. Please reference this file number on any correspondence to us or to other interested parties concerning this matter.

Based upon a review of the information furnished, U.S. Geological Survey 7.5-minute topographical map, and multiple years of aerial photography, we have made a preliminary jurisdictional determination that Wetlands A, B, C, and D meet the current Wetland Delineation Manual criteria and are jurisdictional waters of the United States. Therefore, the placement of dredged or fill material within these wetlands as proposed by your project requires permit authorization from this office. The Corps of Engineers has jurisdiction over all waters of the United States. Discharges of dredged or fill material in waters of the United States, including wetlands, require prior authorization from the Corps under Section 404 of the Clean Water Act (33 USC 403). The implementing regulation for this Act is found at 33 C.F.R. 320-332.

The jurisdictional determination for this project is considered a Preliminary Jurisdictional Determination (PJD) in accordance with Corps regulations at 33 C.F.R. Part 331. PJDs, while sufficient for permit determinations, are not appealable. If you wish, you may request an Approved Jurisdictional Determination (which may be appealed) by contacting our office for further instructions. The PJD is described in the enclosed *Preliminary Jurisdictional Determination Form.* We request that you sign the signature block, and return the form to our office. If you do not concur with the jurisdictional determination, then you will need to obtain an Approved Jurisdictional Determination from our office, and the appropriate permit authorization, prior to impacting any waters identified in the PJD. This jurisdictional determination is valid until the expiration date of the permit authorization, unless new information warrants a revision.

We are interested in your thoughts and opinions concerning your experience with the Kansas City District, Corps of Engineers Regulatory Program. Please feel free to complete our Customer Service Survey form on our website at: http://corpsmapu.usace.army.mil/cm_apex/f?p=regulatory_survey. You may also call and request a paper copy of the survey which you may complete and return to us by mail or fax.

If you have any questions concerning this letter, please feel free to contact me at (816) 389-3739 or by email at matthew.c.sailor@usace.army.mil.

Sincerely,

Matthew C. Sailor
Project Manager

Enclosure

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

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

District Office: Kansas City | File/ORM #: NWK-2014-00673 | PJD Date: Mar 4, 2015

State: MO | City/County: Lawrence/Douglas

Nearest Waterbody: Mud Creek

Location: TRS, LatLong or UTM: Section 17, Township 12 South, Range 20 East
Lat: 39.00242 Long: -95.21491

Name/ Address of Person Requesting PJD: Lawrence Municipal Airport
East Highway 24/40
Lawrence, Kansas 66044

Identify (Estimate) Amount of Waters in the Review Area:

Non-Wetland Waters: ____ linear ft ____ width ____ acres | Stream Flow: N/A

Wetlands: ____ acre(s) | Cowardin Class: ____

Name of Any Water Bodies on the Site Identified as Section 10 Waters: Tidal: ____ Non-Tidal: ____

☑ Office (Desk) Determination
☐ Field Determination: Date of Field Trip: Mar 4, 2015

SUPPORTING DATA: Data reviewed for preliminary JD (check all that apply - checked items should be included in case file and, where checked and requested, appropriately reference sources below):

- ☑ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: Maps submitted by consultant
- ☑ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
  - ☐ Office concurs with data sheets/delineation report.
  - ☑ Office does not concur with data sheets/delineation report.
- ☐ Data sheets prepared by the Corps
- ☐ Corps navigable waters' study:
- ☑ U.S. Geological Survey Hydrologic Atlas:
  - ☐ USGS NHD data.
  - ☑ USGS 8 and 12 digit HUC maps.
- ☑ U.S. Geological Survey map(s). Cite quad name: KS-MIDLAND
- ☐ USDA Natural Resources Conservation Service Soil Survey. Citation:
- ☑ National wetlands inventory map(s). Cite name: Kansas
- ☐ State/Local wetland inventory map(s):
- ☐ FEMA/FIRM maps:
- ☐ 100-year Floodplain Elevation is:
- ☑ Photographs: ☑ Aerial (Name & Date): 5/3/14, 9/18/11, 5/30/11, 3/11/96, 6/21/03
  - ☐ Other (Name & Date):
- ☑ Previous determination(s). File no. and date of response letter: NWK-2002-475
- ☐ Other information (please specify):

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

3/4/15

Signature and Date of Regulatory Project Manager (REQUIRED)

Signature and Date of Person Requesting Preliminary JD (REQUIRED, unless obtaining the signature is impracticable)

EXPLANATION OF PRELIMINARY AND APPROVED JURISDICTIONAL DETERMINATIONS:

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

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

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

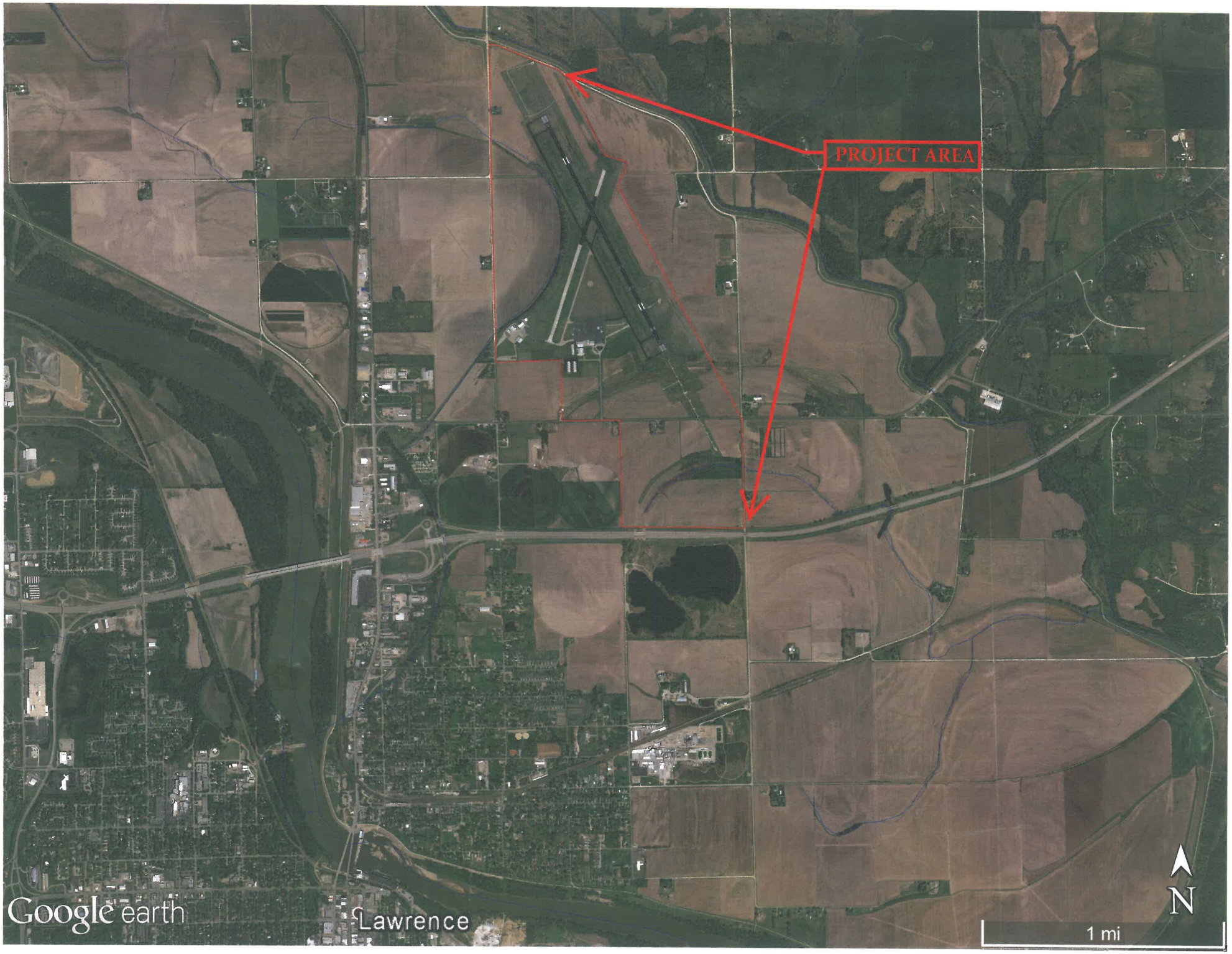
This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

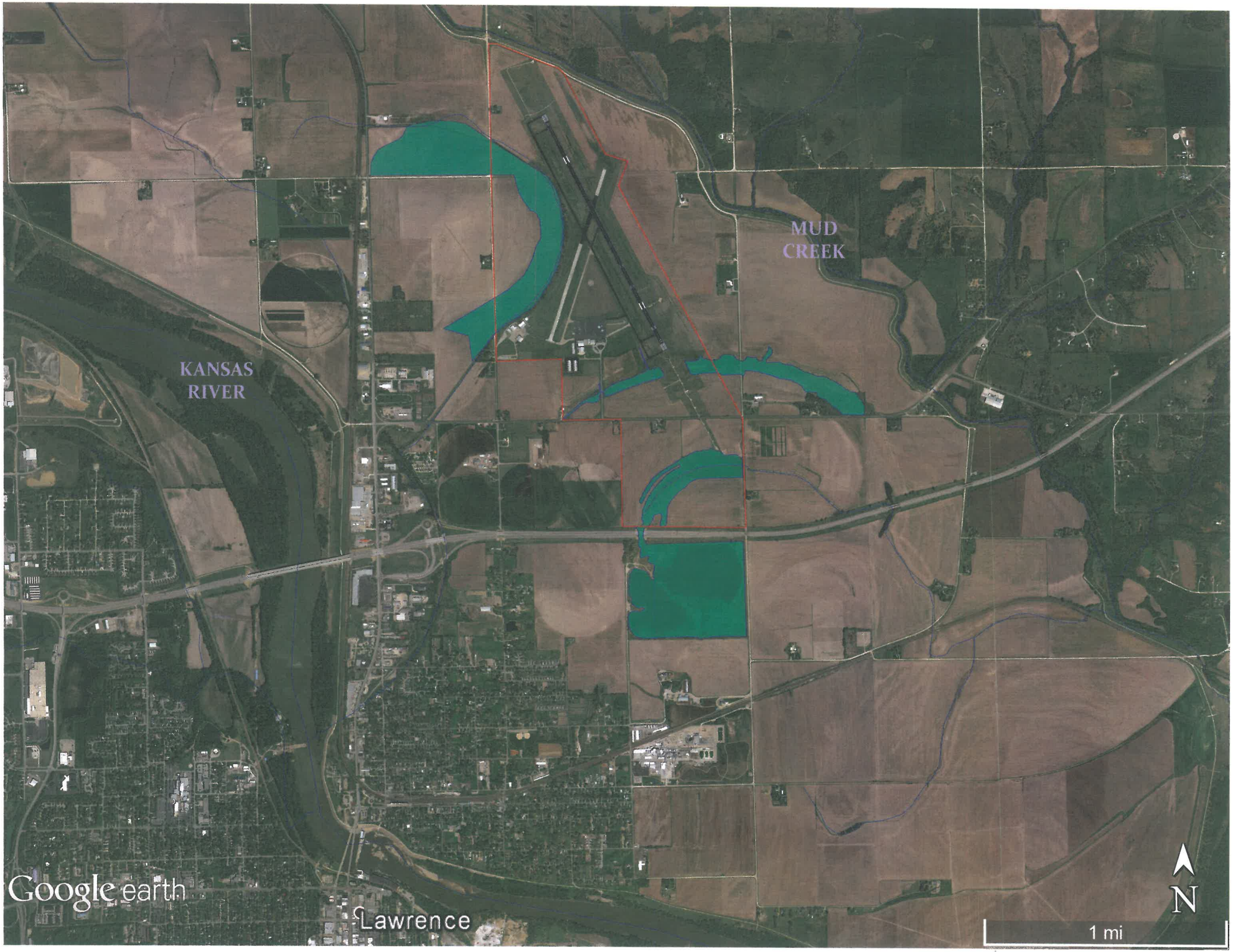
Appendix A - Sites

District Office	Kansas City	File/ORM #	NWK-2014-00673	PJD Date:	Mar 4, 2015
State	MO	City/County	Lawrence/Douglas	Person Requestinq PJD	Lawrence Municipal Airport

Site Number	Latitude	Longitude	Cowardin Class	Est. Amount of Aquatic Resource in Review Area	Class of Aquatic Resource
W-A	39.01235	-95.22319	Palustrine, emergent	130 acres	Non-Section 10 wetland
W-B	39.00273	-95.21424	Palustrine, emergent	8.15 acres	Non-Section 10 wetland
W-C	39.00273	-95.20130	Palustrine, emergent	33.5 acres	Non-Section 10 wetland
W-D	38.99124	-95.20975	Palustrine, emergent	146 acres	Non-Section 10 wetland

Notes:


PROJECT AREA
Google earth
Lawrence
N
1 mi


MUD
CREEK
KANSAS
RIVER
Google earth
Lawrence
N
1 mi

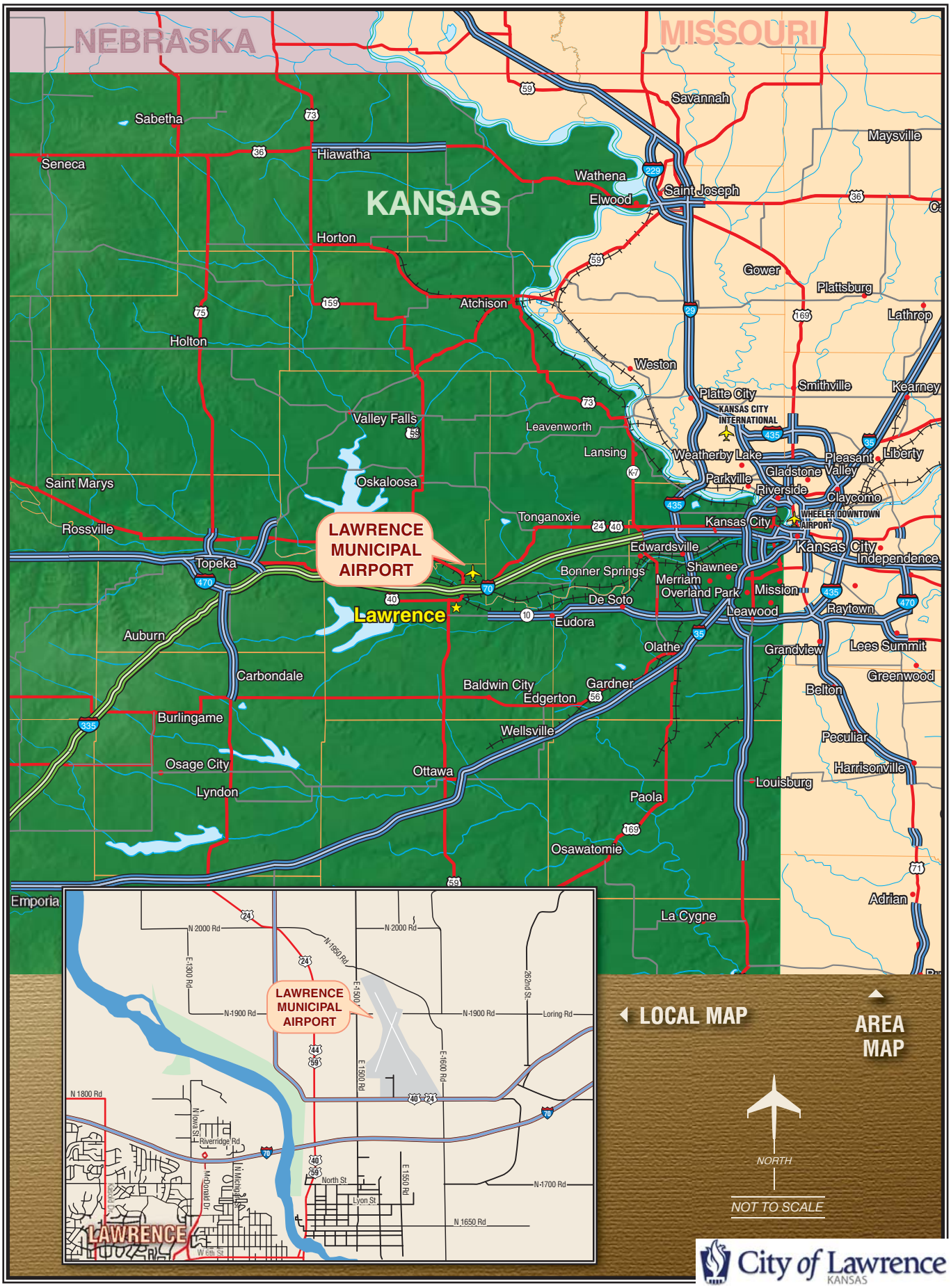

MUD
CREEK
W-A
W-A
W-A
Google earth
3000 ft
N


W-B
W-B
W-C
W-C
W-D
33
Google earth
N
2000 ft

Appendix G: Affected Environment and Area Photography:

- -Exhibit 1A Location Map (Source: 2012 LWC Airport Master Plan)
- -Exhibit 1B Current Land Use (Source: 2012 LWC Airport Master Plan)
- -Exhibit 1C Area Zoning (Source: 2012 LWC Airport Master Plan)
- -Exhibit 1D Airspace Overlay District (Source: 2012 LWC Airport Master Plan)
- -Exhibit 5A Master Plan Concept (Source: 2012 LWC Airport Master Plan)
- -Exhibit C; Lawrence City Parks (Source: City of Lawrence)
- -Exhibit 1Z: Referenced Project Area Photographs (By ADG, Inc.)
    - -Page 1 Referenced Project Area Photographs 1, 7, 11, 15 (By ADG, Inc.)
    - -Page 2 Referenced Project Area Photographs 21, 40, 45, 46 (By ADG, Inc.)
    - -Page 3 Referenced Project Area Photographs 54, 62, 67, 71 (By ADG, Inc.)
    - -Page 4 Referenced Project Area Photographs 26, 34, 19, 76 (By ADG, Inc.)
    - -Page 5 Referenced Project Area Photographs 81, 83, 86, 100 (By ADG, Inc.)
    - -Page 6 Referenced Project Area Photographs 96, 107, 112, 109 (By ADG, Inc.)

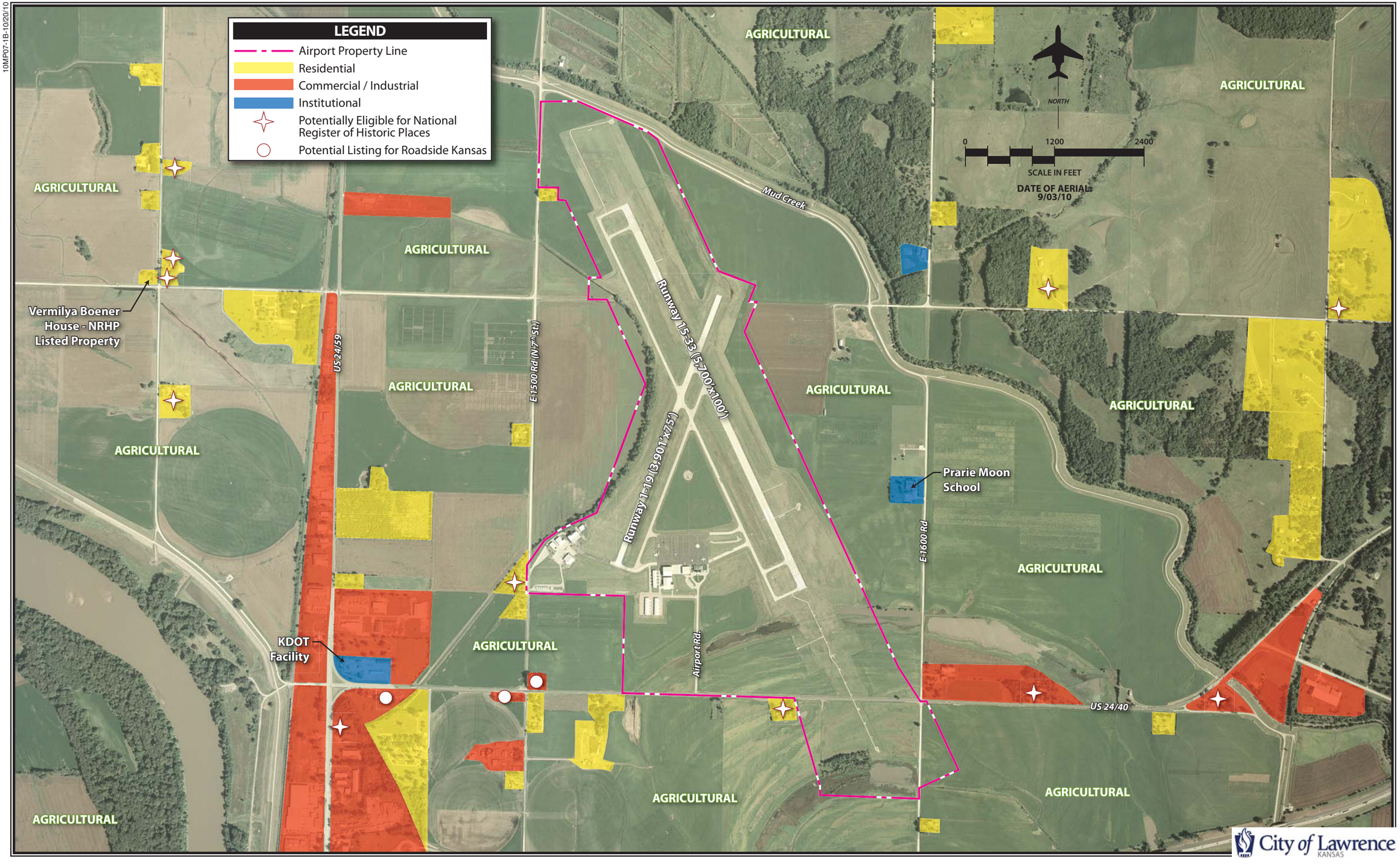
10MP07-1A-8/27/10



City of Lawrence KANSAS

Exhibit 1A
LOCATION MAP

10MP07-1B-10/20/10



City of Lawrence KANSAS

Exhibit 1B
CURRENT LAND USE

10MP07-1C-8/26/10

Source: City of Lawrence

City of Lawrence KANSAS

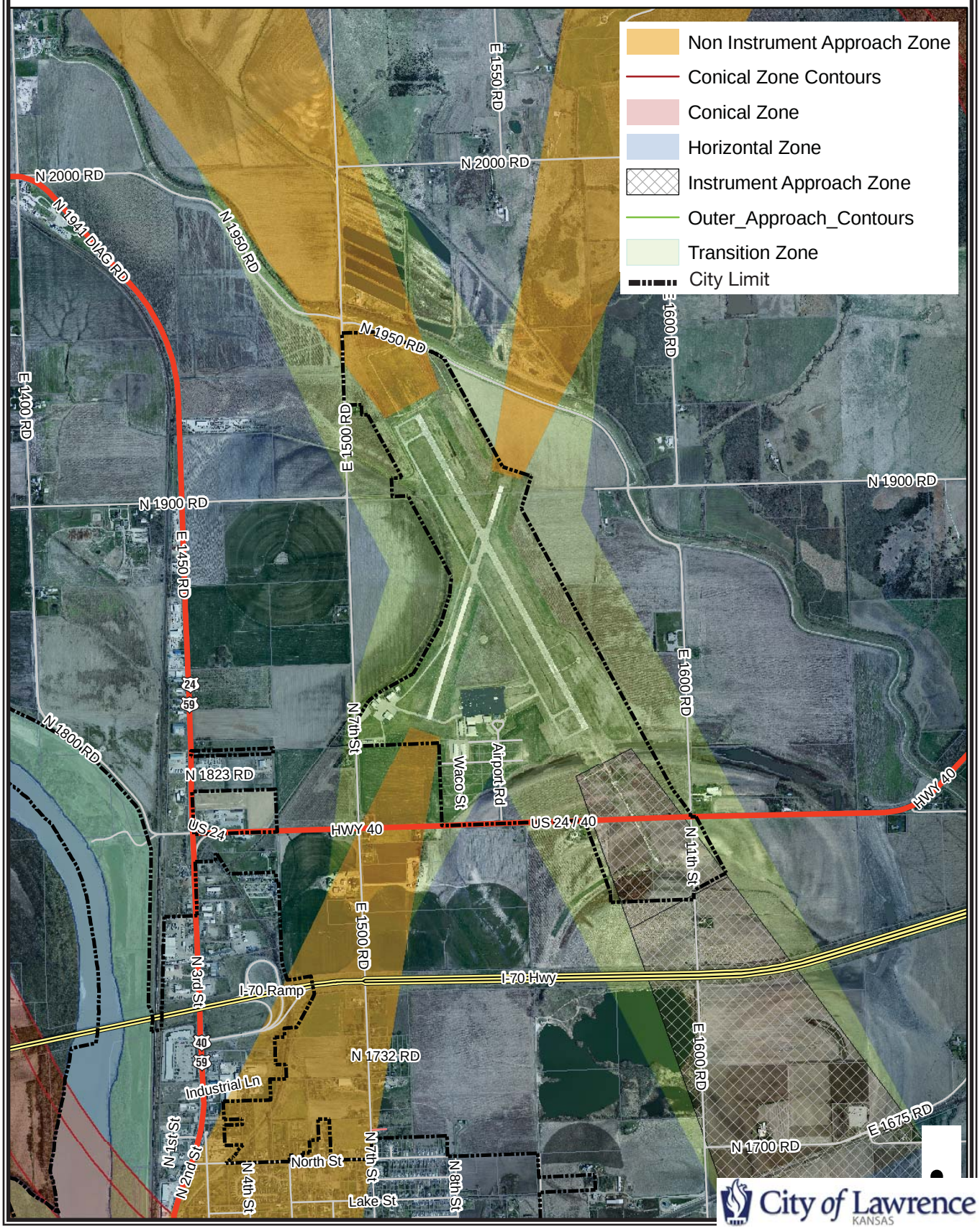
Exhibit 1C
AREA ZONING

10MP07-1D-8/26/10

Airspace Overlay Zoning Districts At Lawrence Municipal Airport

0 485 970 1,940 2,910 3,880 Feet

1 inch = 2,000 feet

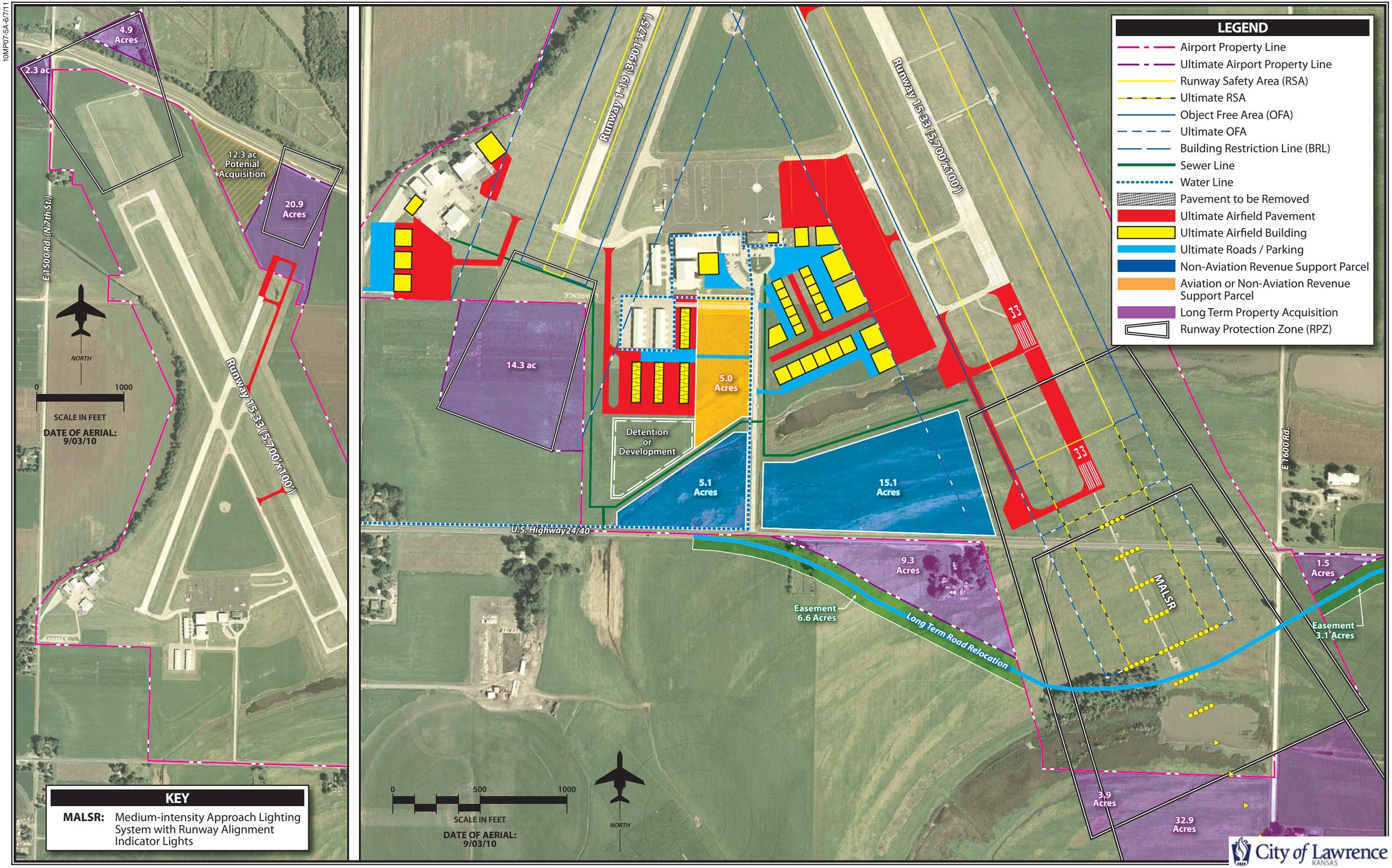


City of Lawrence KANSAS

Source: City of Lawrence

Exhibit 1D
AIRSPACE OVERLAY DISTRICT

10MP07-5A-6/7/11

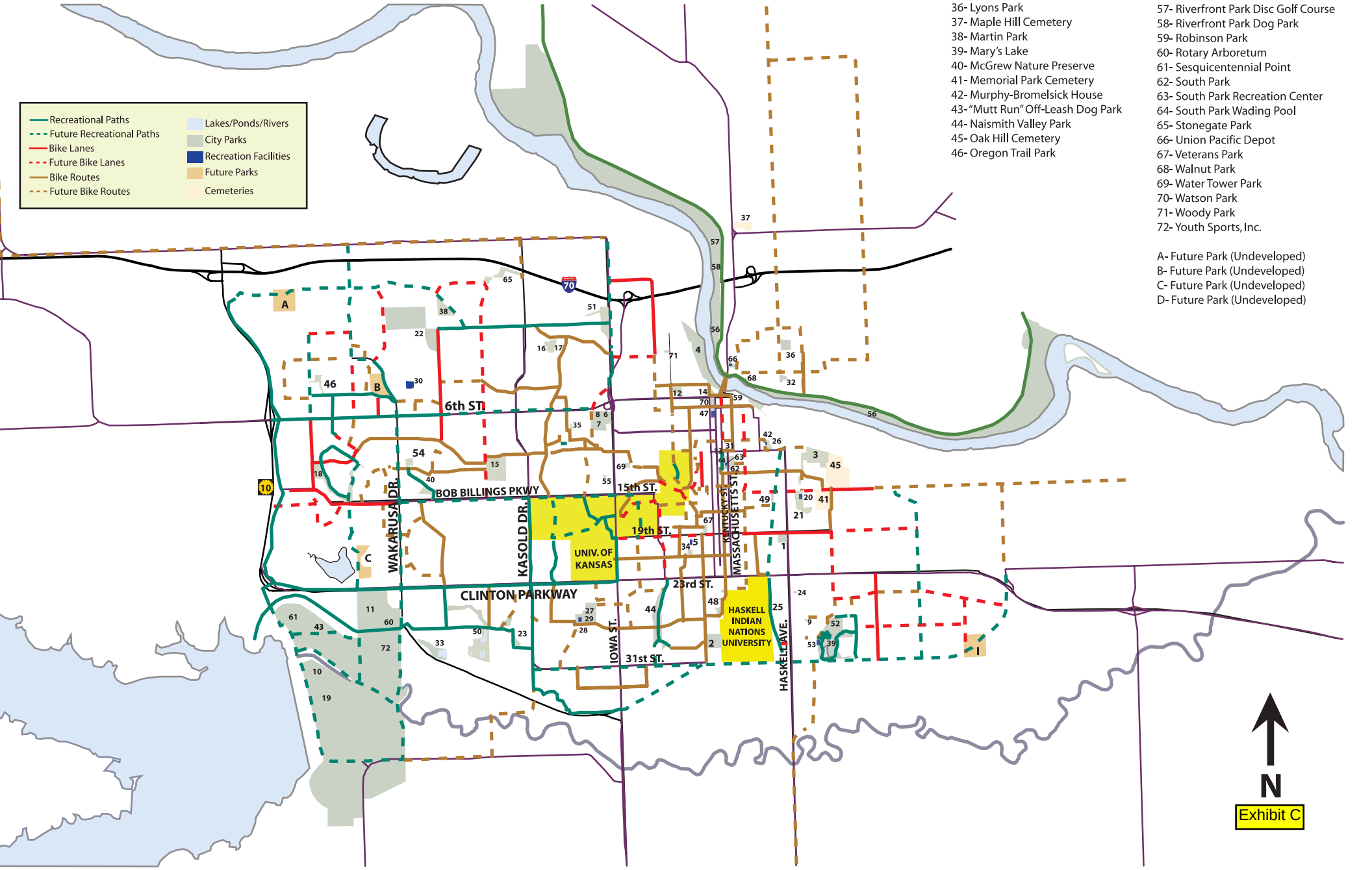


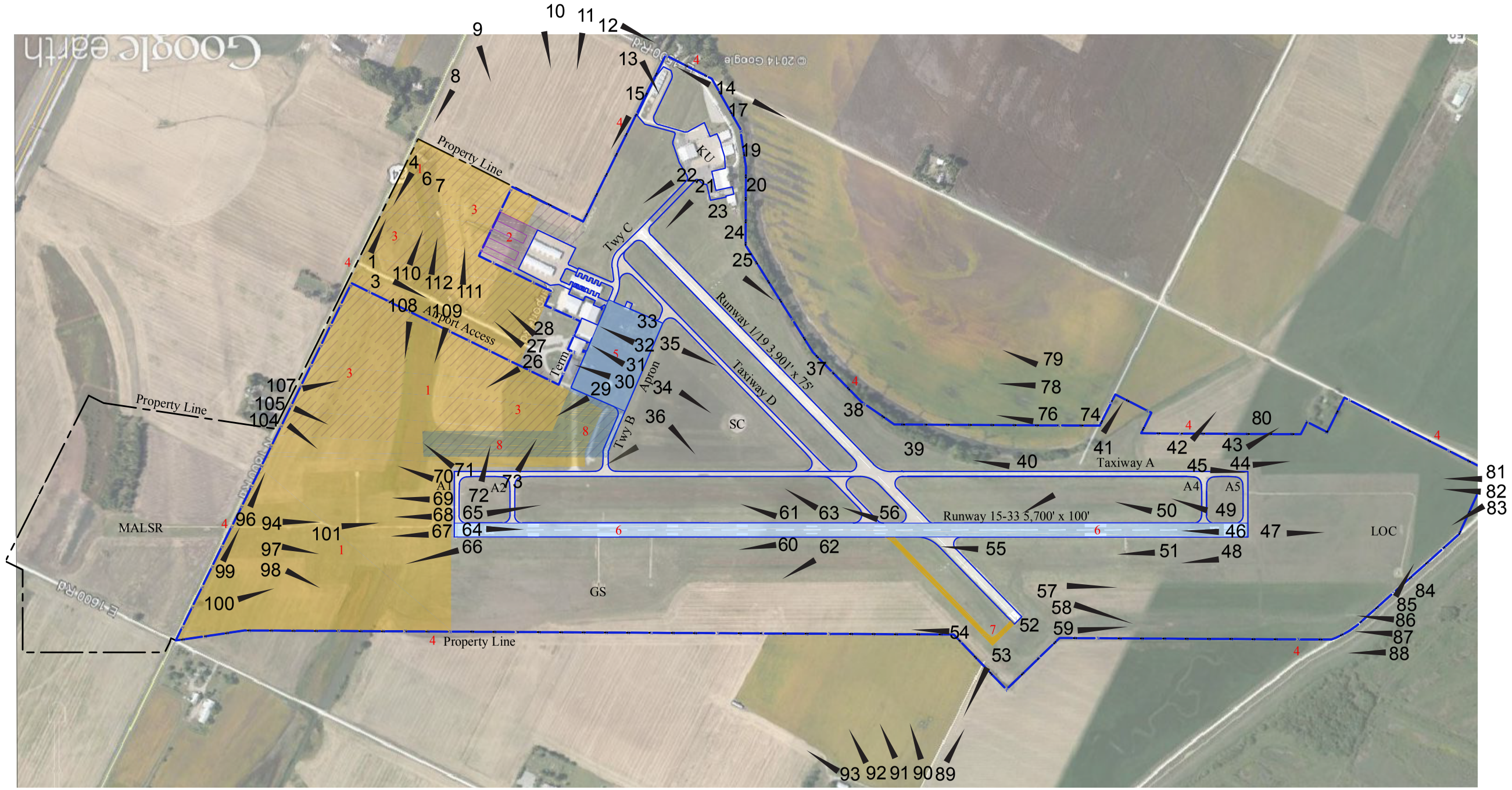
City of Lawrence KANSAS

Exhibit 5A
MASTER PLAN CONCEPT

1- 19th & Haskell Park
2- Broken Arrow Park
3- Brook Creek Park
4- Burcham Park
5- Carl Knox Natatorium
6- Centennial Park
7- Centennial Park Disc Golf Course
8- Centennial Park Skate Park
9- Chaparral Playlot
10- Clinton Lake Outlet Park
11- Clinton Lake Softball Complex
12- Clinton Park
13- Community Building
14- Constant Park
15- "Dad" Perry Park
16- Deerfield Park
17- Deerfield Park Skate Park
18- DeVictor Park
19- Eagle Bend Golf Course and Learning Center
20- East Lawrence Recreation Center
21- Edgewood Park
22- Folks Road Park
Thomas-Hunter Walking Trails
23- Green Meadows Park
24- HAND Park
25- Haskell Rail Trail
26- Hobbs Park/ Municipal Stadium
27- Holcom Park
28- Holcom Park Recreation Center
29- Holcom Sports Complex
30- Indoor Aquatic Center
31- Japanese Friendship Garden
32- John Taylor Park
33- KANZA Southwind Nature Preserve
34- Lawrence Tennis Center
35- Ludlam Park
36- Lyons Park
37- Maple Hill Cemetery
38- Martin Park
39- Mary's Lake
40- McGrew Nature Preserve
41- Memorial Park Cemetery
42- Murphy-Bromelsick House
43- "Mutt Run" Off-Leash Dog Park
44- Naismith Valley Park
45- Oak Hill Cemetery
46- Oregon Trail Park
47- Outdoor Aquatic Center
48- Park Hills Parks
49- Parnell Park
50- Pat Dawson-Billings Nature Area
51- Peterson Road Park
52- Prairie Park
53- Prairie Park Nature Center
54- Quail Run Park
55- Quary Park
56- Riverfront Park
57- Riverfront Park Disc Golf Course
58- Riverfront Park Dog Park
59- Robinson Park
60- Rotary Arboretum
61- Sesquicentennial Point
62- South Park
63- South Park Recreation Center
64- South Park Wading Pool
65- Stonegate Park
66- Union Pacific Depot
67- Veterans Park
68- Walnut Park
69- Water Tower Park
70- Watson Park
71- Woody Park
72- Youth Sports, Inc.

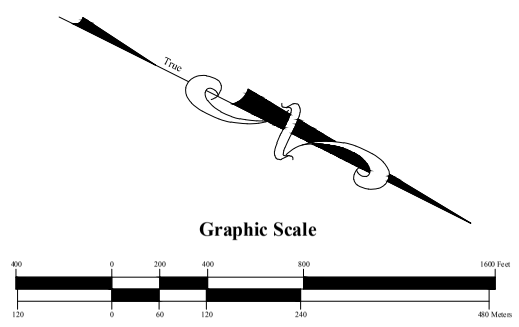
A- Future Park (Undeveloped)
B- Future Park (Undeveloped)
C- Future Park (Undeveloped)
D- Future Park (Undeveloped)





Planned Improvements	
Number	Project
1	Perform Drainage Study on a Portion of the Airport (±120 Ac)
2	Construct T-Hangars and Access Taxiways (±11,650 sqyds)
3	Prepare (Grade and Disturb) Area for Planned Development (±50 Ac)
4	Construct Perimeter Fence (±29,500 lf)
5	Rehabilitate General Aviation Apron (±32,350 sqyds)
6	Rehabilitate (and Strengthen) Runway 15-33 (±63,333 sqyds)
7	Extend Taxiway D to Full-Parallel (±4,950 sqyds)
8	Construct Phase I (±16,500 sqyds) and II (±23,400 sqyds) GA Aprons

EA Site Photos Taken May 13, 2014 and location/direction tagged.



No.	Revision	Ckd	Date

Lawrence Municipal Airport
Lawrence, Kansas

ADG AIRPORT DEVELOPMENT GROUP Inc.
1776 South Jackson Street / Suite 205
Denver, Colorado 80210-3802
303.782.0882 / 303.782.0842 fax
www.ADGAirports.com

AIP Project No. 03-20-0047-17-2014 (EA)

Project No.:	LWC		
Designed By:	JES		
Drawn By:	SPM		
Approved By:	DPH		
Date:	March 2014		

Environmental Assesssment
Projects; Purpose/Need
Aerial Backgroud

Exhibit:
I
of II Exhibits

Photo 1: Airport Road entrance looking west on Hwy 40. White poles delinate crop boundary on airport.

Photo 7: Looking North from airport septic system pump station off Hwy 40.

Photo 11: View looking northeast across privately owned crop land off intersection of Hwy 40 and County Road East 1500 Road.

Photo 15: Looking east on off East 1500 Road on property line of airport and private owner of line similar to Photo 11.

Photo 21: View southeast from KU hangar apron on west side of airfield.

Photo 40: View south, west of Runway 15/33, along east property edge of airport bounded by Kaw Valley Drainage Association creek.

Photo 45: View north, west of Runway 15/33, airport property line.

Photo 46: View south on Runway 15/33.

Photo 54: View southeast off Runway 15/33 just south of Runway 19 threshold. White poles delinate crop boundary lines on airport property.

Photo 62: View south, off east edge of Runway 15/33. AWOS is visible at right edge.

Photo 67: View south, east edge of Runway 15/33, toward Hwy 40.

Photo 71: View south, west edge of Runway 15/33, toward Hwy 40.

Photo 26: View southeast from airport terminal circle drive. White pole delinates crop boundry on airport property.

Photo 34: View north, off apron edge toward segmented circircle at mid-field.

Photo 19: View southwest along 7th St. behind the KU and two other private hangars, with Kaw Valley Drainage creek right of the trees down the embankment.

Photo 76: View east from access road off County Road 1500 North. West property line of airport split by Kaw Valley Drainage creek and private property.

Photo 81: View south toward Runway 15/33 from top of Mud Creek levee and North 1500 Road.

Photo 83: View southeast toward Runway 15/33 showing localizer and doghouse along North 1950 Road at bottom of Mud Creek levee.

Photo 86: View south from County Road N 1950 delinating crop line on airport property.

Photo 100: View north toward Runway 15/33 from Hwy 40 across the safety area covering the drainage creek.

Photo 96: View west along Hwy 40 from access gate off Runway 15/33.

Photo 107: View northwest from Hwy 40 toward Airport Road showing airport property agricultural activity before it falls into drainage creek.

Photo 112: View west off Airport Road culvert span showing water volume after heavy running through property toward Hwy 40. This area was noted as avian habitat in 2012 WHA.

Photo 109: View east showing off Airport Road showing water volume in drainage creek on airport property. In the background is the box culvert for safety area on Runway 15/33. This area was noted as avian habitat in 2012 WHA.

LAWRENCE MUNICIPAL AIRPORT (LWC)

LAWRENCE, KANSAS

AIP PROJECT NO. 03-20-0047-17-2014

ENVIRONMENTAL ASSESSMENT (EA)

FOR

- Perform drainage study on a portion of the airport (±67 acres)
- Construct T-hangar and access taxiways (±11,650 square yards; ±300 feet by ±350 feet)
- Prepare (grade and disturb) area for planned landside development (±50 acres)
- Construct perimeter fencing (±27,400 linear feet)
- Rehabilitate general aviation apron (±32,350 square yards; ±420 feet by ±693 feet)
- Rehabilitate (and strengthen as a consequence) Runway 15-33 (±63,333 square yards; ±100 feet by ±5,700 feet)
- Extend Taxiway D to full parallel (±4,950 square yards; ±35 feet by ±1,272 feet)
- Construct Phase I (±16,500; ±420 feet by ±353 feet) and II (±23,400 square yards; ±185 feet by ±1,138 feet) GA Aprons

and other work as described within the EA.

Prepared by:
Airport Development Group, Inc.
1776 South Jackson Street, Suite 950
Denver, Colorado 80120-3880

For:
City of Lawrence, Kansas
6 East Sixth Street
Lawrence, Kansas 66044

This environmental assessment becomes a Federal document when evaluated, signed, and dated by the Responsible Federal Aviation Administration (FAA) Official.

_____ _____

Responsible FAA Official Date

TABLE OF CONTENTS

1. Purpose and Need

1.1. Introduction - This Environmental Assessment (EA) has been prepared per FAA Order 5050.4B, FAA Order 1050.1E, CHG 1 and the FAA Environmental Desk Reference for Airport Actions.

1.2. Statutory Objectives –

- Evaluate drainage changes needed for proposed airport development (including affects to wetlands) per FAA Advisory Circular 150/5320-5D, *Airport Drainage Design,* Sections 1-6 and 1-7.
- Meet demand for new hangars per FAA Advisory Circular 150/5070-6B, *Airport Master Plans,* Section 807(b) and the approved, on-file ALP.
- Prepare (grade and disturb) area for planned landside development per FAA Advisory Circular 150/5320-5D, *Airport Drainage Design*, Sections 1-6 and 1-7, FAA Advisory Circular 150/5070-6B, *Airport Master Plans,* Section 807(b) and the approved, on-file ALP.
- Control deer and other hazardous wildlife attractants and provide secure perimeter per approved Wildlife Hazard Management Plan for LWC and TSA's *Security Guidelines for General Aviation Airports*, May 2004, Appendix D, and the approved, on-file ALP.
- Preserve general aviation apron pavement per FAA Advisory Circular 150/5380-7A *Airport Pavement Management Program,* FAA Advisory Circular 150/5380-6B *Guidelines and Procedures for Maintenance of Pavement Airport Pavements,* and the approved, on-file ALP.
- Preserve (and strengthen as a consequence) Runway 15-33 pavement) per FAA Advisory Circular 150/5380-7A *Airport Pavement Management Program,* FAA Advisory Circular 150/5380-6B *Guidelines and Procedures for Maintenance of Pavement Airport Pavements,* and the approved, on-file ALP.
- Improve safety of partial parallel taxiway per FAA Advisory Circular 150/5300-13A, Section 405 and the approved, on-file ALP.
- Meet demand for sufficient General Aviation (GA) parking per FAA Advisory Circular 150/5320-5D, *Airport Drainage Design*, Sections 1-6 and 1-7, FAA Advisory Circular 150/5070-6B, *Airport Master Plans,* Section 807(b) and the approved, on-file ALP.

1.3. Proposed Action –

- Perform drainage study on a portion of the airport (±67 acres) – Scheduled in year 2014
- Construct T-hangar and access taxiways (±11,650 square yards; ±300 feet by ±350 feet) - 2016
- Prepare (grade and disturb) area for planned landside development (±50 acres) - 2017
- Construct perimeter fencing (±27,400 linear feet) - 2015
- Rehabilitate General Aviation (GA) apron (±32,350 square yards; ±420 feet by ±693 feet) - 2016
- Rehabilitate (and strengthen as a consequence) Runway 15-33 (±63,333 square yards; ±100 feet by ±5,700 feet) - 2018
- Extend Taxiway D to full parallel (±4,950 square yards; ±35 feet by ±1,272 feet) - 2018
- Construct Phase I (±16,500; ±420 feet by ±353 feet) and II (±23,400 square yards; ±185 feet by ±1,138 feet) GA Aprons – 2018

These proposed actions are included within in the Sponsor's latest Airport Layout Plan (ALP) which was conditionally approved on June 2012.

1.4. Aviation Forecast Data –Baseline 2014 values for this EA are straight-line interpolated and extrapolated (for 2024) from the approved, on-file 2012 Airport Master Plan.

Planning Year	Itinerant General Aviation Operations	Local General Aviation Operations	Military Operations (Itinerant)	Air Taxi (Itinerant)	Total Itinerant	Total Local	--	Total Aircraft Operations
2014	17,090	13,884	150	2,136	19,376	13,884	--	33,260
2019	18,572	15,078	150	2,320	21,042	15,078	--	36,120
2024	24,939	19,035	150	2,928	26,565	19,035	--	45,600
Planning Year	--	--	Single-Engine	Multi-Engine	Turboprop	Business Jet	Helicopter	Total Based Aircraft
2014	--	--	53	5	2	2	2	64
2019	--	--	62	5	3	2	2	74
2024	--	--	78	6	4	3	3	94

2. Alternatives

2.1. Introduction – This section defines the No Action and the Proposed Action. It also explains why each alternative is not considered in detail, each action's expected environmental impacts and conceptual measures needed to mitigate those impacts.

2.2. No Action Alternative – The no action alternative is somewhat self-explaining in that no changes are proposed with respect to the proposed action or means to accommodate it. The No Action alternative does not meet the spirit and intent of Section 1.

2.3. Proposed Action – See Section 1.3

2.4. Reasonable Alternatives Discussion – Due to the nature of the Proposed Action, options are limited. There are no reasonable alternatives to propose and none will be carried forward for evaluation.

3. Affected Environment

3.1. Introduction – This section describes the existing environmental conditions of the potentially affected geographical area.

3.2. Past, Present, and Reasonably Foreseeable Actions –Past Projects (within 5 years) include:

- 2014 Select Medium-Intensity Runway Lighting (MIRL)/Hold Signs, Runway End Identifier Lighting (REILs) and supplemental windcones for Runway 15-33,
- 2013 Seal and Mark Runway 15-33, Taxiway A,
- 2010 Acquire Land.

Present Projects include (as identified in 2012 LWC Master Plan):

- Extension of municipal water to the airport,
- Extension of city wastewater service to the airport.

Future Projects include:

- 2016 Construct T-hangar and access taxiways

3.3. Location Map, Vicinity Map, ALP, Photographs – Depictions and information hereto are found throughout Appendices, but primarily in Appendix G.

3.4. Existing/Planned Land Uses & Zoning – Lawrence Municipal Airport (LWC) is surrounded (adjacent to) agricultural land use, primarily row crop and wheat raising, with the exception of three residential land uses and one commercial use.

Two of the residential uses are, according to the 2012 LWC Master Plan potentially eligible for the National Register of Historic Places. The commercial use is similarly potentially eligible.

The northernmost (closest) limits of the contiguous City of Lawrence proper are found approximately ½-mile due southwest of the Runway 1 end. Sponsor-owned airport properties are essentially an island within unincorporated Douglas County. Refer to Exhibits 1A, 1B, 1C, 1D, 1E and D1 from the 2012 LWC Master Plan as found within Appendix G.

Horizon 2020 constitutes the City of Lawrence's comprehensive planning, currently as of September 4, 2013. Appendix G contains Map 3-1 *Lawrence Urban Growth Area Service Areas and Future Land Use*. This depiction shows Service Area 2 to the south, and Service Area 4 surrounding LWC for the remaining directions. *Horizon 2020* specifies that urban development shall not occur until utilities and drainage (and study thereto) are in place. Map 3-2 *Lawrence Future Land Use* (not appended) specifies that planned residential and commercial uses are to remain well south of Interstate 70 and west of North 9th Street/Harper Road. *Horizon 2020* identifies LWC land uses as Industrial. Horizon 2020 calls for additional non-aviation and aviation-related industrial uses around (with annexation recommended) and within LWC properties. Map 7-2 (not appended) calls for an industrial development on Service Area 2's approximate 230 acres southwest of the LWC and north of Interstate 70. Horizon 2020 calls for "some amount" of "high-quality agricultural uses" on these and nearby development properties for purposes of soils preservation, and that "unique challenges related to storm water management" need to be addressed for development purposes.

3.4.1. Industrial/Commercial Activities – The nearest commercial and industrial land uses (aside from LWC itself) are found due west of LWC along Highway 24 within ½-mile of the Runway 1 end at closest. Refer to Exhibit 1B.

3.4.2. Residential Areas, Schools, Churches, & Hospitals – Nearby residential land uses are found per Exhibit 1B within Appendix G. The Prairie Moon Waldorf School is approximately ¼-mile direct due east of the airport along East 1600 Road. Cavalry Lawrence Church is found approximately 1 mile due southwest from the end of Runway 1 near the Interstate Highway 70 and US Highway 24 exchange. This is the closest church, with several others farther away to the south of LWC within North Lawrence. Lawrence Memorial Hospital is found approximately 2½ miles due southwest from the end of Runway 1. This is the closest hospital, with several others farther away within Lawrence proper.

Planned Improvements

Number	Project
1	Perform Drainage Study on a Portion of the Airport (±67 Ac)
2	Construct T-Hangars and Access Taxiways (±11,650 sqyds)
3	Prepare (Grade and Disturb) Area for Planned Development (±50 Ac)
4	Construct Perimeter Fence (±27,400 lf)
5	Rehabilitate General Aviation Apron (±32,350 sqyds)
6	Rehabilitate (and Strengthen) Runway 15-33 (±63,333 sqyds)
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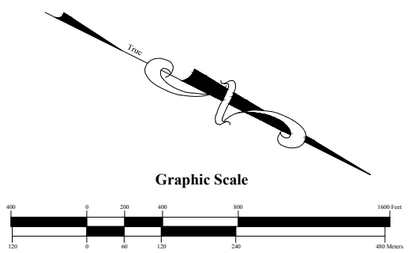

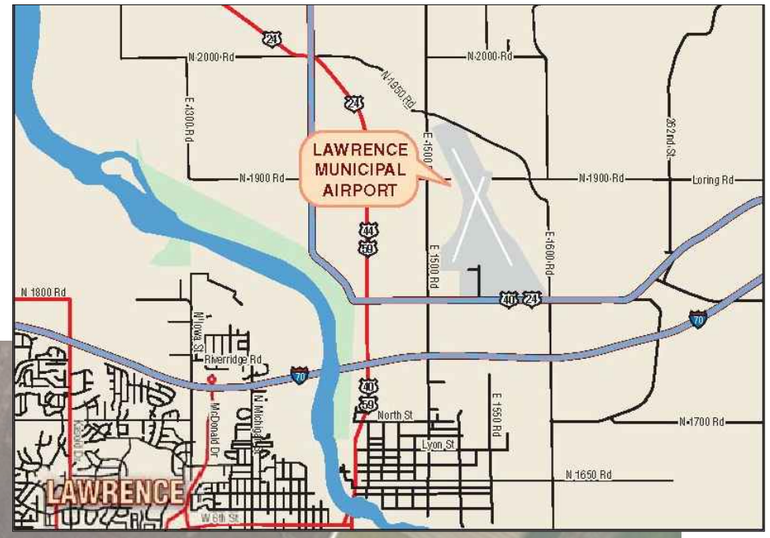

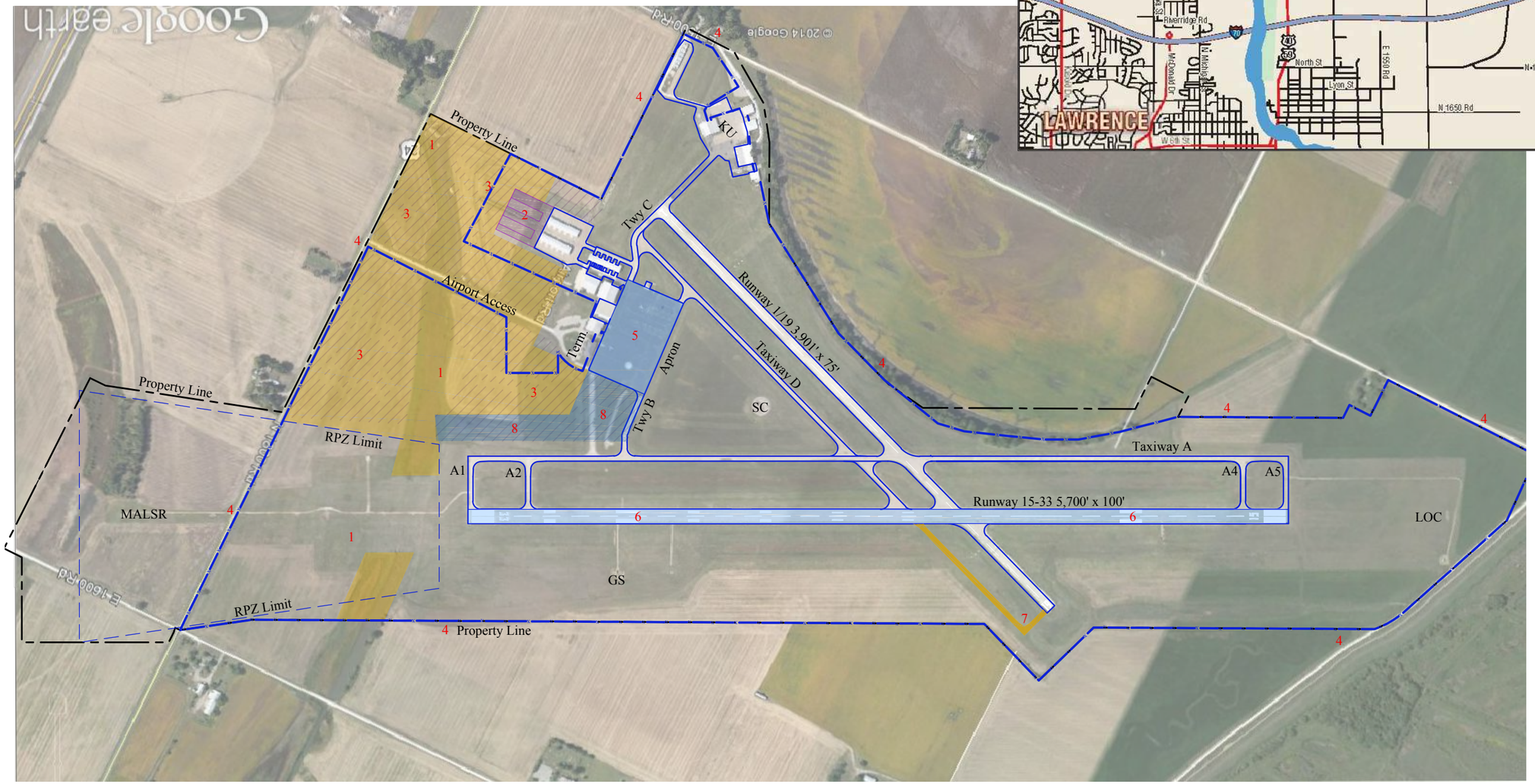

ADG AIRPORT DEVELOPMENT GROUP INC.
1776 South Jackson Street / Suite 950
Denver, Colorado 80210-2852
303.782.0840 / 303.782.0845 fax
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Lawrence Municipal Airport
Lawrence, Kansas

AIP Project No. 03-20-0047-17-2014 (EA)

No.	Revision	Ckd	Date

Project No.:	LWC		
Designed By:	JES		
Drawn By:	SPM		
Approved By:	DPH		
Date:	March 2014		

Environmental Assesssment
Projects; Purpose/Need
Aerial Backgroud

Exhibit:

I

of II Exhibits

3.4.3. Publicly-owned Parks, Recreational Areas, Wildlife & Waterfowl Refuges – Riverfront Park including the disc golf and dog park facilities exist for an approximate 8 mile stretch adjacent to (generally) the north banks of the Kansas River. This park along with three city parks, Lyons Park, John Taylor Park, Walnut Park and the Union Pacific Depot and Maple Grove Cemetery, all/near in North Lawrence, are the closest city parks/recreation areas. Exhibit 1B and C within Appendix G provide depictions. Robinson Park is the nearest county park/recreation area (2 direct miles) from airport properties. It is located at the northern end of the downtown Lawrence area at the south side banks of the Kansas River. Clinton Lake State Park is the nearest (8 direct miles) state park. It is located on southwest side of Lawrence proper. No wildlife or waterfowl refuges or habitat set asides exist within Douglas County.

3.4.4. National/State Forests, Wilderness Areas, Wild & Scenic Rivers, Nationwide Rivers Inventory. No state or federal forests, wilderness areas, or federally-designated wild or scenic rivers exist within Douglas County.

3.4.5. Federally-listed/State-listed Threatened & Endangered Species/Habitat - Query to the Kansas Department of Wildlife and Parks (KDWP) and the US Department of Fish and Wildlife (FWS) (*in italics*) reveals the following within Douglas County (~ indicates Kansas critical habitat associated with status)(T = Threatened, E = Endangered, C = Candidate, SINC = Kansas Species of Need of Conservation, -- = Not Identified):

Species (Common)	Federal/ State Status	Species (Common)	Federal/ State Status
Mead's Milkwood	*T/--*	*Western Prairie Fringed Orchid*	*T/E*
~Pallid Sturgeon	*E/E*	*Sprague's Pipit*	*C/--*
~Flathead Chub	--/T	Snuffbox Mussel	--/SINC
~Piping Plover	T/T	River Shiner	--/SINC
~Redbelly Snake		Southern Bog Lemming	--/SINC
~Sturgeon Chub		Whip-poor-will	--/SINC
~Silver Chub		Yellow-Throated Warbler	--/SINC
~Least Tern		Black Tern	--/SINC
~Mucket Mussel		Short-eared Owl	--/SINC
~Plains Minnow		Crawfish Frog	--/SINC
~Shoal Chub		Ferruginous Hawk	--/SINC
American Burying Beetle		Franklin's Ground Squirrel	--/SINC
Eastern Spotted Skunk		Golden Eagle	--/SINC
Eskimo Curlew		Highfin Carpsucker	--/SINC
Hornyhead Chub		Lake Sturgeon	--/SINC
Chestnut Lamprey		Timber Rattlesnake	--/SINC
Sicklefin Chub		Southern Flying Squirrel	--/SINC
Smooth Earth Snake		Blue Sucker	--/SINC
Snowy Plover		Eastern Hognose Snake	--/SINC
Topeka Shiner		Common Shiner	--/SINC
Whooping Crane	E/E	Johnny Darter	--/SINC
Western Silvery Minnow	--/T	Bobolink	--/SINC
		Cerulean Warbler	--/SINC
		Henslow's Sparrow	--/SINC
		Long-billed Curlew	--/SINC

3.4.6. Wetlands, Floodplains, Floodways. Appendix G contains a flood area depiction a flood area (as Exhibit D1) for the LWC area. Consultation pursuant to the wetland impact category is found in Appendix F.

3.4.7. Historic, Archeological, or Cultural Resources. Consultation hereto is found in Appendix E.

3.5. Affected Political Jurisdiction – City of Lawrence and Douglas County.

3.6. Demographic Information– Refer to Appendix G, Table 2A.

4. Environmental Consequences & Mitigation

4.1. Introduction – This section is organized per the *Environmental Desk Reference* impact categories, with the exception of Section 4.2.

4.2. Resources Not Affected – The Proposed Action would not affect Air Quality; Coastal Barriers; Coastal Zone Management; Wild & Scenic Rivers and Climate impact categories.

4.3. Biotic Resources – Section 3.4.5 identifies potential species/habitat, KDWPT could not document any impacts to currently-listed Threatened or Endangered species. See Appendix B for correspondence.

4.4. Compatible Land Use – The proposed action would not meaningfully modify fleet mix or air traffic/flight procedure changes, the 20-year 65 Day-Night Average Sound Level (DNL) noise contour is confined to existing airport property or within Runway Protection Zone (RPZ) property proposed for acquisition at part of the 2012 airport master plan and the approved Airport Layout Plan (ALP). Given that the noise and social impacts, impact category thresholds are not reached compatible land use impacts similar do not reach thresholds. No social impact objections were noted per Appendix B. Correspondence substantiating the maintenance of compatible land use is found as Appendix D. See Appendices G and H. One of the (compatible land use related) conclusions from the October 2012 Lawrence Municipal Airport (LWC) Wildlife Hazard Assessment was fence construction (herein as proposed improvement no. 4) for the 'high to moderate' risk mammalian species potentially accessing the field from the former Kansas River oxbow area west of midfield. A United States Corps of Engineers (USACE) made a Preliminary Jurisdictional determination for wetlands within the Area of Potential Effect (APE) area to be disturbed. The Environmental Protection Agency (EPA) inferred banking as the appropriate compensatory technique and recommended that banking occur with the 'HUC 8 or smaller watershed as the location of project impacts'. The US Fish and Wildlife Service (FWS) and the Kansas Department of Wildlife, Parks, and Tourism (KDWPT) advised to avoid wetlands if possible.

4.5. Construction Impacts – Sponsor will incorporate project design specification recommendations established in FAA Advisory Circular 150/5370-10, Standards for Specifying Construction of Airports, Item P-156, Temporary Air and Water Pollution, Soil Erosion and Siltation Control. Kansas Department of Health and Environment (KDHE) correspondence recommends erosion control Best Management Practices, low-impact development features/design and reseeding with warm-season grass types. The Cultural Resources Investigation recommends further investigation in the event that cut exceeds 65 inches in depth in th e area around the T-hangar (proposed improvement item no. 2).

Before construction begins, (KDHE) will require storm water permitting to comply with the National Pollutant Discharge Elimination System (NPDES) as the APE disturbance area exceeds 1 acre.

USACE identified non-classified, non-caveated jurisdictional wetlands within the APE disturbance area, see Appendix F. As such a Clean Water Act (CWA) 404 permit from USACE will be prerequisite to construction. Mitigation planning pursuant this permitting will likely find wetland banking as the preferred compensatory mechanism, and EPA recommended the banking to occur with the 'HUC 8 or smaller watershed as the

location of project impacts'. FWS and KDWPT advised to avoid wetlands if possible. See Appendix B for correspondence.

FWS recommends that "construction and operations impacts should avoid wetlands, streams and riparian woodlands to the maximum extent possible. Construction rights-of-way should be surveyed for the presence of marshes and other wetland habitat types. All disturbed riparian area should re-vegetated with native plants as soon as possible after disturbance.

4.6. Section 4(f) Resources – Section 3.4, KDWPT and FWS correspondence finds that no public recreational area would be impacted. The National Park Service (NPS) did not respond to correspondence. See Appendix B for correspondence.

4.7. Federally-listed Endangered and Threatened Species – A Threatened and Endangered Species assessment for FWS's recommended plant species: Mead's milkweed *(Asclepias meadii)* and western prairie fringed orchid *(Platanthere praeclara)* observed that suitable habitat does not exist on airport or adjoining properties. The investigation also revealed no observed instances of FWS's recommended northern long-eared bat *(Myotis septenrionalis)* specie (for investigation). The investigator noted that any tree clearing activities should occur within FWS's specified November 1 to February 28 period. FWS response concurring with these observations was not received. See Appendix B for correspondence.

4.8. Energy Supplies, Natural Resources, and Sustainable Design - The proposed action would not cause a substantial demand on available energy resources, would not cause an appreciable increase in aviation fuel consumption, and no objections of subject were noted per Appendix B.

4.9. Environmental Justice – The proposed action would not cause a disproportionate effect on a minority or low-income population, and no objections of subject were noted per Appendix B.

4.10. Farmlands – Form AD-1006 was executed and filed with the National Resources Conservation Service (NRCS). Although on-airport farmland would be converted from an agricultural land use, the threshold for additional action or consultation therein was not reached. See Appendix B for correspondence. Preparer consultation with *NEPAassist* revealed a Resource Conservation and Recovery Act (RCRA) notation as an active and in compliance (Dream Wings; registered to 2550 North 7th Street, Lawrence, KS).

4.11. Floodplains – Most of the APE is not within a designed floodplain as the airport is levee-protected (FEMA 2010; Zone X); a small portion of the proposed action item no.4 (perimeter fence area) around the historical Kansas River oxbow west of midfield has the potential to be constructed within the flood plain (FEMA 2010; Zone AE). This portion of the proposed action does reach impact category threshold.

4.12. Hazardous Materials – A review of EPA's *Environmapper* tool revealed no APE instances of concern. EPA noted a review of their NEPAassit planning tool revealed no instances of concern. KDHE identified 'Scotch Cleaners", more than two miles from LWC properties, as a contaminated drycleaner facility. See Appendix B for correspondence.

4.13. Historic and Archeological – a cultural resources investigation for specific APE areas was conducted per SHPO instruction. No historic register-eligible resources were located during the investigation. The cultural work recommended additional

investigation in the event that earthmoving activities occur below 65 inches within a portion of the APE generally between the T-hangars and the low area between Highway 24 and the terminal area, all east of Airport Road.

4.14. Induced Socioeconomic – Given that noise, compatible land use and social impacts, impact category thresholds are not reached, no social impact objections were noted. See Appendix B.

4.15. Light Emissions and Visual Impact - No airport lighting or lighting modifications are planned pursuant to Section 1.3, no visual effect objections were noted per Appendix B correspondence.

4.16. Noise – The 20-year 65 DNL noise contour is confined to existing airport property or within Runway Protection Zone (RPZ) property proposed for acquisition at part of the 2012 LWC Airport Master Plan.

4.17. Social Impacts – No relocations are specified per Section 1.3. Per Appendix B, objections of subject were not noted. As such impact category thresholds are not reached.

Best Management Practices (BMPs) will be used to restrict children from the construction/demolition site, which may include the posting of signs around the construction site, prohibiting access, fencing, warnings posted around areas of open excavation, and site policing.

4.18. Solid Waste – Solid waste as a consequence of Section 4.5 is not considered significant and is within the capacity of the County landfill to accommodate. Solid waste generated as a consequence of the marginal increase in aviation activity per Section 1.3 is similarly considered inconsequential. The nearest landfill is sufficiently distant (more than 2 miles) from LWC pursuant to Federal Aviation Administration (FAA) compatible land use recommendation. No solid-waste related objections were noted per Appendix B.

4.19. Water Quality – Related Section 4.5 impacts have been addressed, no water quality related objections were noted per Appendix B, KDHE noted that an National Pollutant Discharge Elimination System (NPDES) permit (for greater than one acre of disturbance is compulsory for project earthmoving activities.

4.20. Wetlands – Per FAA guidance, Environmental Protection Agency (EPA), FWS and KHWPT recommendation, wetlands delineation was performed and reviewed by USACE. USACE found unclassified, non-caveated area jurisdictional wetlands within the APE. See Appendix F. EPA recommended mitigation to occur with the ‘HUC 8 or smaller watershed as the location of project impacts’. FWS and KDWPT advised to avoid wetland if possible. FWS “will be given the opportunity to review the public notice” for any permitting. FWS encouraged project(s) administrators to consult. See Appendix B for correspondence.

5. Cumulative Impact Analysis

Consideration of the proposed action's impact category threshold determinations per Section 4, combined with Section 3.2 suggests that there are no cumulative impacts.