# Appendix J – Wetland Delineation, Functional Assessment, and Associated Correspondence

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October 2018	

# Minnesota Wetland Conservation Act Notice of Decision

Local Government Unit (LGU) Shingle Creek Watershed Management Commission

Address 3235 Fernbrook Lane Plymouth, MN 55447

1. PROJECT INFORMATION					
Applicant Name Bridget Rief – Metrop Airports Commission	P	roject Name rystal Airport	Date of Applicatio November 2018 – submitted outside growing season		Application Number
Attach site locator	map.				
Type of Decision:					
Wetland Boundary	or Type	No-Loss	Exemption	Se	equencing
	Replacement Pla	n	Banking Plan		
Technical Evaluation Pa	anel Findings and	•	•		
Approve		Approve with cond	itions		Deny
_	2. LOCAL GO	OVERNMENT UN	IT DECISION		
Date of Decision: 5/21	1/2019				
Approved	Appro	oved with conditions	(include below)	Den	ied
LGU Findings and Con	clusions (attach ad	ditional sheets as new	cessary).		
On behalf of the Appli application for Wetlan Crystal Airport Road i Shingle Creek watersh	icant (Metropolitar Id Boundary & Typ In Sections 4 & 5, 7 Ined (Figure 1).	Airports Commission of approval for the C F118N, and Sections wan Barrett of Mead	on) Mead & Hunt subn rystal Airport project lo 32 & 33, T119N, R21 & Hunt in October 201	ocated at W, within	n the
The TEP met on May 13, 2019. Changes were made to the boundaries of Wetland 5 in the northeast corner of the project site. The boundary is now shown as open/continuing to the east towards the creek. Additionally, a change to connect a section of the boundary on the west was also made. Approved wetland boundaries are shown in the attached Approved Wetland Boundaries Maps (Figure 2). The Shingle Creek WMC approves the application for wetland boundary and type. This decision is valid for five years.For Replacement Plans using credits from the State Wetland Bank:Bank Account #Bank Service AreaCountyCredits Approved for Withdrawal (sq. ft. or nearest .01 acre)					

**Replacement Plan Approval Conditions.** In addition to any conditions specified by the LGU, the approval of a <u>Wetland Replacement Plan</u> is conditional upon the following:

**Financial Assurance:** For project-specific replacement that is not in-advance, a financial assurance specified by the LGU must be submitted to the LGU in accordance with MN Rule 8420.0522, Subp. 9 (List amount and type in LGU Findings).

**Deed Recording:** For project-specific replacement, evidence must be provided to the LGU that the BWSR "Declaration of Restrictions and Covenants" and "Consent to Replacement Wetland" forms have been filed with the county recorder's office in which the replacement wetland is located.

**Credit Withdrawal:** For replacement consisting of wetland bank credits, confirmation that BWSR has withdrawn the credits from the state wetland bank as specified in the approved replacement plan.

#### Wetlands may not be impacted until all applicable conditions have been met!

LGU Authorized Signature:

Signing and mailing of this completed form to the appropriate recipients in accordance with 8420.0255, Subp. 5 provides notice that a decision was made by the LGU under the Wetland Conservation Act as specified above. If additional details on the decision exist, they have been provided to the landowner and are available from the LGU upon request.

Name	Title		
Meaghan Watson, Wenck Associates Inc.	SC WMC WCA Agent		
Signature M-WR	Date 5/22/2019	Phone Number and E-mail 763-252-6986 mwatson@wenck.com	

THIS DECISION ONLY APPLIES TO THE MINNESOTA WETLAND CONSERVATION ACT. Additional approvals or permits from local, state, and federal agencies may be required. Check with all appropriate authorities before commencing work in or near wetlands.

Applicants proceed at their own risk if work authorized by this decision is started before the time period for appeal (30 days) has expired. If this decision is reversed or revised under appeal, the applicant may be responsible for restoring or replacing all wetland impacts.

This decision is valid for three years from the date of decision unless a longer period is advised by the TEP and specified in this notice of decision.

## **3. APPEAL OF THIS DECISION**

Pursuant to MN Rule 8420.0905, any appeal of this decision can only be commenced by mailing a petition for appeal, including applicable fee, within thirty (30) calendar days of the date of the mailing of this Notice to the following as indicated:

Check one:

Appeal of an LGU staff decision. Send	Appeal of LGU governing body decision.
petition and \$ fee (if applicable) to:	Send petition and \$500 filing fee to:
Meaghan Watson, Wenck Associates, Inc.	Executive Director
7500 Olson Memorial Highway, Suite 300	Minnesota Board of Water and Soil Resources
Golden Valley, MN 55427	520 Lafayette Road North
	St. Paul, MN 55155

# 4. LIST OF ADDRESSEES

SWCD TEP member: Stacey Lijewski – stacey.lijewski@hennepin.us

BWSR TEP member: Ben Carlson – ben.carlson@state.mn.us

LGU TEP member (if different than LGU Contact):

DNR TEP member: Jason Spiegel – Jason.spiegel@state.mn.us

 ☑ DNR Regional Office (if different than DNR TEP member): Becky Hortonbecky.horton@state.mn.us
 ☑ WD or WMO (if applicable): judie@jass.biz
 ☑ Applicant (notice only) and Landowner (if different): Metropolitan Airports Commission (Bridget Rief) – bridget.rief@mspmac.org
 ☑ Members of the public who requested notice (notice only): Consultant: Mead & Hunt (Evan Barrett)
 –evan.barrett@meadhunt.com
 ☑ Corps of Engineers Project Manager (notice only): mvp-reg-inquiry@usace.army.mil
 □ BWSR Wetland Bank Coordinator (wetland bank plan applications only)

# **5. MAILING INFORMATION**

≻For a list of BWSR TEP representatives: <u>www.bwsr.state.mn.us/aboutbwsr/workareas/WCA\_areas.pdf</u>

For a list of DNR TEP representatives: <u>www.bwsr.state.mn.us/wetlands/wca/DNR\_TEP\_contacts.pdf</u>

#### Department of Natural Resources Regional Offices:

NW Region:	NE Region:	Central Region:	Southern Region:
Reg. Env. Assess. Ecol.	Reg. Env. Assess. Ecol.	Reg. Env. Assess.	Reg. Env. Assess. Ecol.
Div. Ecol. Resources	Div. Ecol. Resources	Ecol.	Div. Ecol. Resources
2115 Birchmont Beach Rd.	1201 E. Hwy. 2	Div. Ecol. Resources	261 Hwy. 15 South
NE	Grand Rapids, MN	1200 Warner Road	New Ulm, MN 56073
Bemidji, MN 56601	55744	St. Paul, MN 55106	

For a map of DNR Administrative Regions, see: http://files.dnr.state.mn.us/aboutdnr/dnr\_regions.pdf

➢ For a list of Corps of Project Managers: <u>www.mvp.usace.army.mil/regulatory/default.asp?pageid=687</u> or send to:

> US Army Corps of Engineers St. Paul District, ATTN: OP-R 180 Fifth St. East, Suite 700 St. Paul, MN 55101-1678

≻For Wetland Bank Plan applications, also send a copy of the application to:

Minnesota Board of Water and Soil Resources Wetland Bank Coordinator 520 Lafayette Road North St. Paul, MN 55155

#### 6. ATTACHMENTS

In addition to the site locator map, list any other attachments:

Figure 1 – Project Location Map

**Figure 2 – Approved Wetland Boundaries** 



# Wetland Delineation Report

Crystal (MIC) Airport Airfield Improvements

Report prepared for Metropolitan Airports Commission Minneapolis, Minnesota



May 2019

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#### Appendices

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# 1. Introduction

Crystal Airport (MIC) (Airport) is a general aviation reliever airport owned and operated by the Metropolitan Airports Commission (MAC). The Airport is located approximately seven miles northwest of downtown Minneapolis. The Airport is bordered by 63rd Avenue North on the north, Bottineau Blvd (County Road 81) on the west, and 56th Avenue North/Bass Lake Road (County Road 10) to the south. Airport property covers approximately 430 acres over four contiguous parcels. The central parcel includes the main airfield and associated facilities, roads, and hangar areas. The Airport is bordered by single-family residences with some park/open spaces to the east and lies within the Shingle Creek subwatershed within the Mississippi River – Twin Cities Watershed. The MAC Wildlife Conservation Area sits to the east of the Airport's East Building area along Twin Creek. A project location map is presented in Appendix A.

The airfield at MIC consists of three paved runways, one turf grass runway, two supporting taxiways, and numerous privately-owned hangars. The primary runways 14L/32R and 14R/32L are 3,267 feet and 3,266 feet long, respectively. Both are 75 feet wide. The crosswind runway (Runway 6L/24R) is 2,499 feet long and 75 feet wide. The turf runway, 6R/24L is 2,123 feet long and approximately 137 feet wide. There are two non-precision instrument approaches to the Airport. Fueling, flight training, aircraft storage, and aircraft maintenance services are available from a full-service fixed-base operator. The primary role of the airport is to serve personal, recreational, and business aviation users. The Airport provides business services including flight training and aircraft maintenance.

MAC has prepared a number of Long-Term Comprehensive Plans (LTCP) for the Airport. The most recent approved planning document for Crystal Airport was adopted in October 2017 and covers a planning horizon year of 2035 (2035 LTCP). This plan recommended "right-sizing" the Airport to better align infrastructure and activity levels by decommissioning the south parallel runway (14R/32L), simplifying the airfield and opening up property for development of both aeronautical and non-aeronautical opportunities. The 2035 LTCP updated the findings of the previous 2025 LTCP and extended the planning horizon to 2035.

The purpose of the proposed action at MIC is to pursue the following three general infrastructure goals for the Airport:

- 1) Better align airfield infrastructure to match existing and forecasted activity levels;
- 2) Preserve and improve operational capabilities for design aircraft family; and
- 3) Enhance safety by simplifying the runway and taxiway layout.

The need of the proposed action is based on achieving the following six objectives that support the project purpose, as defined in the following subsections:

- 1) Simplify airfield geometry;
- 2) Provide the required runway length for critical design aircraft needs;
- Enhance instrument approach capability and mitigate penetrations for both ends of the main primary runway;



- 4) Improve Airport ground vehicle circulation;
- 5) Increase aircraft parking apron capacity; and
- 6) Develop excess Airport property for non-aeronautical use.

In support of an alternatives analysis that explores meeting these goals, a wetland delineation was conducted by Mead & Hunt, Inc. (Mead & Hunt) within an Area of Interest (AOI) on June 4 – 5, 2018 and on September 24 – 26, 2018. The AOI comprises 50.1 acres spread over eight separate areas located in Section 4, Township 118N North, Range 21 West, and Section 33, Township 119N North, Range 21 West, Hennepin County, Minnesota. A total of seven wetlands were identified within the AOI.

This report summarizes the results of the wetland delineation. Delineator qualifications are provided in Appendix H. Mead & Hunt staff who performed the wetland delineation are:

- Brauna Hartzell, BS Biological Science, Florida State University, 1982; MS Environmental Monitoring, University of Wisconsin-Madison, 1994; 15 years wetland delineation practice.
- Kim Shannon, BS Biology, Oklahoma State University, 1994; MS Applied and Natural Science (Botany), Oklahoma State University, 1997; 10 years wetland delineation practice.

# 2. Methods

The wetland determination made use of available resources to provide context and background information and to assist in the field assessment including:

- U.S. Geological Survey (USGS) topographic maps and 2-foot elevation contours provided by Minnesota Geospatial Commons, Minnesota Elevation Mapping Project, 2011.
- U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) soil survey, Web Soil Survey at <u>http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx</u>
- U.S. Fish and Wildlife National Wetland Inventory (NWI) mapping with update for East-Central Minnesota at <a href="https://www.fws.gov/wetlands/data/mapper.html">https://www.fws.gov/wetlands/data/mapper.html</a>
- 2016 National Wetland Plant List (Lichvar, R.W., D. L. Banks, W. N. Kirchner, and N. C. Melvin, 2016)
- Minnesota Climatology Working group, Wetland Delineation Precipitation Data Retrieval from Gridded database <a href="http://climateapps.dnr.state.mn.us/gridded\_data/precip/wetland/wetland.asp">http://climateapps.dnr.state.mn.us/gridded\_data/precip/wetland/wetland.asp</a>
- Aerial photography (MnGEO WMS Image Service, USDA-FSA National Agriculture Imagery Program (NAIP), Minnesota Historical Aerial Photographs Online, GoogleEarth)

The field methods used conform to the Routine Onsite Method of the *1987 U.S. Army Corps of Engineers'* (USACE) Wetland Delineation Manual, as enhanced by the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (U.S. Army Corps of Engineers, 2011). Under wetland delineation guidance for the Minnesota Board of Water and Soil (BWSR), the project area falls within the Midwest Region based on township boundaries. However, the project area also falls within the Northcentral/Northeast Region as shown on USACE region maps; therefore, the Northcentral and Northeast regional supplement data sheets were used to be consistent with USACE guidance. Soil characteristics were examined by digging pits with a 16-inch tile spade and hydrologic indicators were visually assessed. Soil pits were left open for a minimum of 15 minutes to adequately assess the water table. Munsell Soil Color charts were used to determine the hue, value, and chroma for the matrix and any redoximorphic features in each soil layer.

Vegetation was documented on the North Central/Northeast Regional (NC/NE) data forms. Percent cover of each species in each stratum was estimated. The herbaceous stratum was sampled within a 5-foot radius plot; a 15-foot radius plot for the shrub/sapling stratum; and a 30-foot radius plot for the tree and woody vine stratum. The 2016 National Wetland Plant List (Lichvar, R.W., et al, 2016) was used to determine the wetland indicator status for each species and the 50/20 rule was applied to determine dominance.

Antecedent precipitation was assessed following procedures developed by the NRCS. Precipitation data three months prior to fieldwork were compared to 30-year precipitation averages (1981-2010) to determine if hydrologic conditions were normal, wetter, or drier than normal for the area.



All area within the AOI was examined. A total of 25 data points—17 in uplands and eight in wetlands collected on two site visits were established to characterize the range of soil, vegetation, and hydrologic conditions. Wetland boundary points were indicated by wire pin flags placed approximately 25-50 feet apart. These sampling points and wetland boundary flags were surveyed with a Trimble Geo7X capable of sub-meter accuracy and mapped using Geographic Information System (GIS) software. The wire pin flags were removed after survey so that mowing operations would not be impacted.

The following appendices are included with this report:

- Appendix A Project Location and Topography Map
- Appendix B Detailed Topographic Map, NRCS Soils Map, and Aquatic Resources Map
- Appendix C Historical Aerial Photography
- Appendix D WETS Analysis and Climatic Data
- Appendix E Wetland Boundary Maps
- Appendix F Data Sheets
- Appendix G Field Photographs
- Appendix H Delineator Qualifications

# 3. Results and Discussion

## A. Site Description

The AOI covers approximately 50.1 acres split across eight separate areas. The largest sections of the AOI cover areas at either end of the primary runways (Areas B and E/H) and a large area proposed for non-aeronautical development (Area G) at the northern entrance road (Zane Avenue North). Smaller sections of the AOI cover two taxiway connector areas, each of which is about 0.6 acres in size (Areas C and D). Proposed perimeter road additions at the north end of the primary runways and on the western side of the Airport connect hangar areas and facilitate aircraft movement within the airfield (Areas A and F). Areas A through G were examined during an early June site visit; lands within Area H were examined during a late September field visit. A project location map is presented in Appendix A.

Hangar storage areas surround the airfield, positioned at and named for the four cardinal directions – North, South, East and West. Nearly all infield areas consist of grasses and forbs and are mown on a regular basis. In the Northeast quadrant, Twin Creek flows to the southeast to Upper Twin Lake, just outside of Airport property. The airfield is relatively flat with little elevation change over the 430 acres of Airport property. The southwestern side is somewhat higher at approximately 870 feet (NAVD 1988), gently sloping to the north and east to about 858 feet along the Twin Creek stream channel. See Appendix B for a detailed Topographic Map.

Airfield drainage is managed through a system of swales and culverts. Closed infiltration areas are also utilized to infiltrate drainage at the southern and western sides of the Airport. The main runways (14L/32R and 14R/32L) divide the airfield along a northwest-to-southeast axis. Lands to the north and east of this axis are drained to Twin Creek, a Public Water Watercourse (Unnamed Stream M-058-002), and DNR Public Waters Wetland (27-639W). The remaining areas of the Airport drain internally to the west or south and runoff is infiltrated in closed basins in these areas.

Infield areas are actively managed by regular mowing. At the time of field work, many areas within the AOI had been mowed, with some regrowth observed, making vegetation identifiable in most cases. Reference areas, either unmown or with more regrowth, on other parts of the Airport were examined where identification was difficult. Most of the infield areas were dominated by a mix of grasses and forbs consisting of Kentucky blue grass, poverty grass, brome, tall rye grass, prairie cinquefoil, great and woolly plantain, common yarrow, yellow wood sorrel, and chickweed.

#### (1) Soils Mapping

About 50% of Airport property is covered by soils mapped as Udorthents (wet stratum, cut and fill land) and Urban Land. These areas generally underlay developed areas of the Airport – the hangar storage areas and portions of the main runways – where sandy or loamy soil material was placed to level land in preparation for construction. Because of the variability in these soil units, typical soil profile descriptions are not available.

Another 40% of Airport land is dominated by three soil units: poorly drained and very poorly drained Forada sandy loam (0 to 2 percent slopes), moderately well drained Duelm loamy sand (0 to 2

percent slopes), and excessively and well drained Hubbard loamy sand (1 to 6 percent slopes). Within the AOI, non-developed areas are covered primarily by Forada sandy loam (0 to 2 percent slopes) and Duelm loamy sand (0 to 2 percent slopes); developed areas mapped as Udorthents or Urban land account for approximately 50% of the AOI.

Typical soil profiles for Forada sandy loam (D10A) show a black (10YR 2/1) loam over a very dark gray (10YR 3/1) loam in the A horizon. The B horizon is marked by a dark grayish brown (2.5Y 4/2) sandy loam with dark gray (10YR 4/1) iron depletions and yellowish brown (10YR 5/6) iron concentrations. This soil is rated as predominantly hydric (85%).

The Duelm loamy sand (0 to 2 percent slopes) (D17A) soil profile is marked by a black (10YR 2/1) loamy sand in the A horizon underlain by a dark brown (10YR 3/3) loamy sand to 16 inches in depth. Underlying this is a dark yellowish brown (10YR 4/4) coarse sand to 20 inches in depth and the top of the B horizon. This soil is not rated as hydric.

Depressional areas, occurring along Twin Creek and an area at the southern end of the Airport within the AOI, generally are covered by hydric soils from the very poorly drained Seelyeville and Markey soils (depressional, 0 to 1 percent slopes) (D30A). The deep profile of the Seelyeville series shows a black (10YR 2/1) muck over a dark brown (7.5YR 3/2) muck to 19 inches in depth. The deep Markey series profile consists of very dark brown (10YR 2/2) muck material over very dark grayish brown (10YR 3/2) and very dark brown (10YR 2/2) muck layers to 32 inches in depth. This mapped soil unit is rated as hydric.

Soils present within the AOI are summarized in Table 1. Soils rated as hydric or predominantly hydric are highlighted in the table below. Soils mapping for the AOI is presented in Appendix B.

Map unit symbol	Map unit name	Percent of AOI	Primary Landform	Hydric Rating (Percent)
D10A	Forada sandy loam, 0 to 2 percent slopes	30.2%	Flats, stream terraces	Yes (85)
D17A	Duelm loamysand, 0 to 2 percent slopes	9.3%	Flats	No (7)
D30A	Seelyeville and Markey soils, depressional, 0 to 1 percent slopes	5.0%	Depressions on stream terraces	Yes (100)
D31A	Urban land-Duelm complex, 0 to 2 percent slopes	3.3%	Stream terraces	No (5)
D64B	Urban land-Hubbard complex, Mississippi River Valley, 0 to 8 percent slopes	5.2%	Stream terraces	No (0)
D67B	Hubbard loamysand, 1 to 6 percent slopes	5.9%	Stream terraces, hillslopes	No (3)
M-W	Water, miscellaneous	0.3%		No (0)

Table 1. Summary of Soils in Area of Interest

Map unit symbol	Map unit name	Percent of AOI	Primary Landform	Hydric Rating (Percent)
U1A	Urban land-Udorthents, wet substratum, complex, 0 to 2 percent slopes	1.1%	Outwash plains, moraines, stream terraces	No (0)
U2A	Udorthents, wet substratum, 0 to 2 percent slopes	15.2%	Outwash plains, moraines, stream terraces	No (0)
U3B	Udorthents (cut and fill land), 0 to 6 percent slopes	21.4%	Moraines	No (0)
U4A	Urban land-Udipsamments (cut and fill land) complex, 0 to 2 percent slopes	3.1%	Outwash plains, stream terraces	No (0)

#### Table 1. Summary of Soils in Area of Interest

#### (2) Aquatic Resources

The National Wetland Inventory (NWI) indicates several areas of mapped wetlands within Airport lands: a floodplain complex associated with Twin Creek, a large area just west of the East Building complex in the infield, and a large area at the southern end of the primary runways near Area E. The floodplain complex shows a mixture of forested and emergent wetland types while most other areas are mapped as emergent, temporary flooded wetlands (PEM1A).

The Twin Creek floodplain complex skirts the eastern edge of Area G and no wetlands are mapped in this area of the AOI. Within Area E, at the southern end of the primary runways, a large area is mapped as emergent, temporary flooded wetland (PEM1A).

MN Public Water (27-639W) lies just to the east of the airfield and is mapped as a combination of PEM1A, PEM1C, and PFO1A. Twin Creek (mapped as Public Watercourse) flows southeasterly through this complex to Upper Twin Lake (MN Public Water 27-42P).

Wetlands within the AOI are classified as Circular 39 Type 1. See Appendix B for aquatic resources mapping.

#### (3) Historic Aerial Photograph Review

Aerial photographs from 1945, 1956, 1962, 1967, 1971, 1991, 1997, 2000, 2006, 2010, 2013, 2015, 2016, 2017, and 2018 were reviewed to assess areas within the AOI for wet signatures. These photos are presented in Appendix C and focus on Areas E/H and G, areas with delineated wetlands. As discussed in later sections, wetlands were not delineated in other portions of the AOI and historic imagery for these areas is not presented.

#### Area G

The earliest photograph in this collection, taken in 1945, shows only about a third of the area under row crop production. By 1956, nearly all of the Area G is being cultivated except for the



Twin Creek floodplain. Two ditches flowing west-to-east towards the creek appear to be draining these fields.

The 1962 photograph shows Area G in agricultural use, prior to any construction in this area. By this time, Runways 14L/32R and 6L/24R had been constructed further to the south along with hangars at the West and South Building Areas. Two tree-lined ditches running eastward to the Twin Creek floodplain are visible as well as a fairly large but sparsely wooded area west of a farm access road (that later becomes Zane Avenue). The eastern edges of the two fields appear to be saturated along the creek.

Photographs taken in 1967 and 1971 show a continued pattern of agricultural use with the western wood lot experiencing growth and canopy closure. The two tree-lined ditches are also seeing ongoing growth.

The general vicinity of Area G in 1991, twenty years later, appears mostly as a managed landscape with the two wooded areas. The wood lot just west of Zane Avenue, seen as somewhat more open than it currently is, is generally in the same configuration as today. A second wooded area appears to follow "L-"shaped drainage ditches that run to the western edge of the Twin Creek floodplain. This wooded ditch is the northern drainage ditch as seen in the 1956 photo. The active floodplain appears to extend to the west into Area G. These wooded features remain today in basically the same configuration. Lands outside of these features appear to be managed by mowing.

By 1997, the Maintenance Building has been constructed north of the North Building Area, along Zane Avenue, just outside of the Area G boundary. Discussions with maintenance personnel indicated that at some time in the early 2000's (or perhaps earlier at the time of the Maintenance Building construction), the drainage was modified to carry flows through swales along the north hangar access road. This modification cut-off active drainage through the ditch to the east and with no inlets, these ditches now only carry surface run-off.

At some point around 2010, the fencing along Twin Creek (which forms the eastern boundary of Area G) appears to have been reconstructed and elevated on a berm which served to direct instream flows to a narrower channel and modified the extent of flooding in the broader floodplain. Images post-2010 show the broader floodplain inside the fence as being actively managed.

#### Areas E and H

The first photo in this series, taken in 1945, shows most of Area E/H to be undeveloped for agricultural purposes. There appears to be a shallow basin surrounded by scrub-shrub-type vegetation. Drainage to this area apparently flows from the northeast via a ditch cutting through agricultural lands to the east.

By 1956, some residential development is occurring on the fringes of Area E/H while the scrubshrub area appears unaltered. Between 1962 and 1967, the area sees continued single-family residential development on either side while construction of runways and taxiways at this end of



the airport has been completed. The hangar access road on the east side of Area E/H has also been constructed. Grading at the Runway 31 end (now Runways 32L and 32R) has covered a large portion of the northern part of Area E/H. The scrub-shrub area remains mostly intact but sees some decrease in size perhaps due to filling by 1971. Twenty years later in 1991, the scrub-shrub area appears largely as it does today.

In 1997, Area E/H appears to be managed as it currently is although a darker area indicating different vegetation, and/or a different hydrologic regime is seen just south of the Area E/H boundary. The darker area varies slightly over time, perhaps reflecting different moisture levels but remains in the same general area with respect to the Area E boundary.

Two small saturated areas can be seen consistently in several photos starting in 2010 (Spring 2010: Hennepin County) on either side of the proposed perimeter road extension. Over the course of numerous photos (2015, 2016, 2017, and 2018), these areas consistently show saturated wet signatures. This location was investigated during field work and is documented as Wetlands 1 and 2 in the Findings section below.

#### (4) Antecedent Climatic Conditions

Precipitation worksheets using the gridded method from the Minnesota Climatology Working Group were calculated for the three months prior to field work for each site visit. This analysis indicated that climatic conditions were drier than normal for the June 2018 visit and site conditions were within normal range at the September field visit (see Appendix D).

Four days prior to the September site visit, approximately 4.5 inches of rain fell on site. During the Fall field work, another 0.3 inches of precipitation fell on September 25. Precipitation data for September is presented in Appendix D.

# B. Findings

#### (1) Wetlands

A total of seven wetlands were delineated in the vicinity of the AOI during the two site visits. Wetland boundary maps with sampling point locations are presented in Appendix E followed by data sheets and field photographs in Appendices F and G. Table 2 summarizes the delineated wetlands within the AOI which are described in detail below.

Wetland	Wetland Type	Circular 39 Type	Dominant Vegetation	Total Area (Acres)	Total Area (Sq. Ft)
		Del	ineated June 2018		
1	Seasonally Flooded Basin	Type 1	Water smartweed, blunt spikerush	0.027	1,174.63
2	Seasonally Flooded Basin	Type 1	Water smartweed, dark green bulrush	0.031	1,343.44
3	Forested Floodplain	Type 1	Black ash, green ash, buckthorn, raspberry, reed canary grass	0.059	2,564.86
4	Seasonally Flooded Basin	Type 1	Water smartweed	0.060	2,619.77
5	Seasonally Flooded Basin	Type 1	Water smartweed	0.131	5,706.40
		Deline	ated September 2018		
6	Seasonally Flooded Basin	Type 1	Crabgrass, barnyard grass	0.179	7,790.95
7	Seasonally Flooded Basin	Type 1	Lady's-thumb, meadow foxtail, barnyard grass	0.156	6,779.07
Total				0.642	27,979.11

#### Table 2. Summary of Delineated Wetlands within the Area of Interest

## (a) Wetlands 1 and 2 (PEM1A/Type 1)

Wetlands 1 and 2 (W1 and W2) are small shallow basins located within Area E straddling the proposed perimeter road corridor. NWI mapping shows a large shallow area mapped as emergent (PEM1A) located in the infield south of the Runway 32R blast pad.

Data points 1 through 3 were taken in a transect crossing each wetland and the upland area separating the two wetlands. The locations of these sampling points are found on the Wetland Boundary Maps in Appendix E. Data sheets and field photographs are presented in Appendices F and G.

#### Vegetation

At both wetland data points DP1 and DP3, water smartweed (*Persicaria hydropiper: OBL*) was a dominant in the herb layer. Blunt spike rush (*Eleocharis obtusa*: OBL) was a co-dominant at DP1 and dark green bulrush (*Scirpus atrovirens*: OBL) was a co-dominant at DP3. Another minor component of the herb stratum at both wetland sampling points was field meadow-foxtail (*Alopecurus pratensis*: FAC). The dominant species at wetland sampling points DP1 and DP3 are hydrophytic (OBL) and meet the wetland vegetation criterion.

The area experiences mowing as part of regular maintenance activities at the airport. At the time of field work, vegetation was approximately 6 inches in height. Plant identification of water smartweed and dark green bulrush was made by reference to other nearby areas with more mature growth visible.

#### Hydrology

While evidence of surface water, a high water table, or saturation was not observed at either DP1 or DP3 under drier than normal climatic conditions, wetland hydrology was indicated by field observation of secondary indicators Geomorphic Position (D2) and a positive FAC-Neutral Test (D5) at both these sampling points. Examination of several recent aerial photographs (Google Earth 2018, 2017, 2016 in Appendix C), show saturated signatures corresponding to these areas and thus fulfill the secondary indicator Saturation Visible on Aerial Imagery (C9) at both sampling points. Wet signatures (darker areas) can be seen in other photographs taken in previous years later in the growing season.

#### Soils

Seelyeville and Markey soils (depressional, 0 to 1 percent slopes) (D30A) cover a large area in this vicinity. These soils consist of deep muck profiles. However, soil profiles taken at wetland sampling points DP1 and DP3 indicated layers of very dark grayish brown (10YR 3/2) to very dark brown (10YR 2/2) sand over black (10YR 2/1) or very dark gray (10YR 3/1) sand layers with dark reddish brown (10YR 3/4) to yellowish red (5YR 4/6) redox features. These soils profiles satisfied the hydric soils criterion by meeting the Sandy Redox (S5) hydric soils indicator.

It is therefore likely that the sandy profiles are indicative of placement of fill materials over the original mucky soils.

The upland data point (DP2) did not satisfy any hydric soils indicator with a very dark brown (10YR 2/2) sand over a mixed very dark gray (10YR 3/1) and black (10YR 2/1) sand layer. Redox features were not found in the very dark gray (10YR 3/1) component, the largest percentage component (90%) of the mixture. Redox features were found in the black (10YR 2/1) sand matrix component, the much smaller component by percentage basis (8%) of the overall layer. This profile did not meet any hydric soils indicators. The soil pit was dug to refusal at 16 inches where a very hard compacted layer was encountered.



#### Wetland Boundary

The wetland boundary was based on distinct differences in vegetation, hydrology, soils and topography. The upland sampling point (DP2) was taken on a transect between the two wetland sampling points on slightly higher ground. In transition to uplands, vegetation shifted to include Kentucky blue grass (*Poa pratensis*: FACU) and tall rye grass (*Schedonorus arundinaceus*: FACU) as dominants, and indicators of hydric soils were lacking in the mixed soils. Wetland hydrology was absent at the upland data point.

Topography changes seen as a slightly higher rise between the two wetlands in the otherwise nearly flat infield determined the boundary in this area.

#### (b) Wetland 3 (PFO1A/Type 1)

Wetland 3 (W3) is a small area of open canopy within a forested area located west of Zane Avenue within Area G. The more open central area is dominated by herbaceous vegetation and woody saplings and is ringed by black ash and box elder.

This wood lot is visible in many historical images as it experiences canopy closure over time. In 1962, the area is fairly sparse but over the following 50 years, the canopy has nearly closed (see 2010 image). In many of the images, a slightly open area can be seen in the middle of the wood lot that appears to correspond to W3.

This small basin appears to collect surface runoff from the south and was relatively undisturbed at the time of field work. W3 does not appear on NWI mapping.

Sampling points DP4 (wetland) and DP5 (upland) were taken in this area. The locations of these sampling points are found on the Wetland Boundary Maps in Appendix E. Data sheets and field photographs are presented in Appendices F and G.

#### Vegetation

The mix of vegetation within W3 was dominated by common red raspberry (*Rubus idaeus*: FAC) and reed canary grass (*Phalaris arundinacea*: FACW) in the herb stratum, green ash (*Fraxinus pennsylvanica*: FACW) and buckthorn (*Rhamnus cathartica*: FAC) in the sapling layer, black ash (*Fraxinus nigra*: FACW) and box elder (*Acer negundo*: FAC) in the tree layer, and Virginia-creeper (*Pathenocissus quinquefolia*: FACU) in the vine stratum. Other species including American elm (*Ulmus americana*: FACW) and black cherry (*Prunus serotina*: FACU) completed the assemblage. Also observed in the wetland area were sedge (*Carex* sp.) and river-bank grape (*Vitus riparia*: FAC). The dominant species within W3 are hydrophytic (FAC and FACW) and meet the hydrophytic vegetation criterion.

#### Hydrology

Wetland hydrology was indicated. At data point DP5 (wetland), secondary indicators Geomorphic Position (D2) and a positive FAC-Neutral Test (D5) were met. Runoff from the south appears to drain into this wooded area and collect in this shallow basin with no apparent outlet before infiltrating into the subsoil.

#### Soils

Forada sandy loam (0 to 2 percent slopes) is mapped underlying Wetland 3. The primary component of this series and another minor component are rated as hydric (see Appendix B for component list), making this a predominantly hydric soil. At wetland sampling point DP5, a layer of black (7.5YR 2.5/1) sandy loam over a black (7.5YR 2.5/1) sandy loam with brown (7.5YR 4/4) redoximorphic features was documented. This profile meets hydric soils indicator Redox Dark Surface (F6); therefore, hydric soils are present.

#### Wetland Boundary

The wetland boundary was determined by a transition to a plant community dominated by upland or facultative species with minor wetland components, an absence of hydric soils indicators, and a lack of wetland hydrology indicators.

In uplands, the vegetation shifted to one dominated by Siberian elm (*Ulmus pumila*: FACU), box elder, and buckthorn in both the tree and sapling strata at upland sampling point DP4. Other species observed as minor components included honeysuckle (*Lonicera x bella*: FACU) and garlic mustard (*Alliaria petiolata*: FACU) as American elm and green ash (both FACW) crossed the boundary. Hydrophytic vegetation was not present as the Prevalence Index was not satisfied at 3.09.

Hydric soils and wetland hydrology indicators were absent at DP4. The soil profile noted here was marked by a thick layer of very dark grayish brown (10YR 3/2) sandy loam over a pale brown (10YR 6/3) sand layer, both of which lacked redoximorphic features. Wetland hydrology was neither present nor indicated at this upland sampling point.

#### (c) Wetlands 4 and 5 (PEM1A/Type 1)

Wetlands 4 and 5 (W4 and W5) are emergent wetland communities located at the eastern boundary of Area G in a flat area situated within the Twin Creek floodplain. Slopes on the western side of this area rise three to four feet. The eastern boundary of Area G is formed by a fence which parallels the creek's stream bank. At the northern corner of Area G, the fence appears to be constructed on a berm, near the culvert exit under 63<sup>rd</sup> Avenue.

W4 and W5 do not appear on NWI mapping. The Twin Creek floodplain complex to the east is mapped as a mixture of forested and emergent wetland types.

This area is currently managed by regular mowing. However, historically, this area was part of the Twin Creek floodplain and often shows vegetative signatures consistent with the rest of the floodplain in aerial photos (1962, 1991, 1997, 2000, and 2006). Starting in 2010, the area exhibits signs of vegetative management (see Appendix C).



Two tree-lined ditches, one running eastward to the Twin Creek floodplain, and the other intersecting the western end of the first ditch, form an "L"-shape, just north of the Maintenance Building. These vacated ditches are lined with 40 - 50-feet tall mature cottonwood (*Populus deltoides*: FAC), box elder, and American elm as dominants. Other species present included black willow (*Salix nigra*: OBL), green ash, black cherry, grape (*Vitis* sp.), stinging nettle (*Urtica dioica*: FAC), and Virginia creeper. The eastern end of the ditch system forms the northern boundary of W5 and is mowed regularly.

These two ditches, as noted previously, were cut off from active drainage. No inlets were observed so surface runoff appears to be the primary source of hydrology. Test pits dug into each of the two ditches revealed that wetland hydrology was not present and that hydric soils were not present in the sandy soils.

Given these conditions – an alteration of hydrology due to the berm inhibiting normal flooding, regular vegetation management, and road construction and other soil disturbance – normal circumstances were not considered to be present in both wetlands.

Four sampling points on a transect were taken within Wetland 4 (DP6 – 9) and two paired sampling points within Wetland 5 (DP10 and 11). The locations of these points are shown on the Wetland Boundary Maps provided in Appendix E; data sheets along with field photographs are presented in Appendices F and G. The complex topography is shown on the detailed topography map in Appendix B.

#### Vegetation

The area had been recently mown at the time of field work. The plant community at DP7 (wetland) was dominated by water smartweed (*Persicaria hydropiper*: OBL) which was present at nearly every data point on the transect through W4. Water smartweed also dominated at wetland sampling point DP10 within W5 along with minor components blunt spike rush and reed canary grass.

One large cottonwood sits on the 63<sup>rd</sup> Avenue road embankment and several isolated box elder trees stand further south near W5.

#### Hydrology

Topographic rises along both sides of this part of the floodplain form a shallow basin within which both wetlands sit. Wetland hydrology is indicated at DP7 (wetland) within W4. Secondary indicators Geomorphic Position (D2) and a positive FAC-Neutral Test (D5) were observed and satisfied the hydrology criterion. The same secondary indicators were met at DP10 within W5.

#### Soils

Soils mapped in this portion of Area G are Seelyeville and Markey soils (depressional, 0 to 1 percent slopes), a soil unit rated as hydric. Upland and wetland sampling points in this area describe a deep soil profile of black (2.5/N) loam that met hydric soils indicator Thick Dark Surface (A12). No redox features were observed in any of the profiles. Soils were dry and crumbly to 20 inches in depth. The hydric soils criterion was satisfied at all the sampling points.



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#### Wetland Boundary

The wetland boundary was determined by a transition to a plant community dominated by upland species, a lack of wetland hydrology indicators, and changes in elevation. In uplands, the plant community shifted to one dominated by Kentucky blue grass and smooth brome (*Bromus inermis*: UPL). Chickweed (*Stellaria meadia*: FACU), white clover (*Trifolium repens*: FACU), dandelion (*Taraxacum officinale*: FACU), and plantain (*Plantago major*. FACU) entered the upland plant community as minor components.

Topography played a key role in determining the boundary. A topographic rise of about two to four feet along the east and west sides of Wetland 4 aided in boundary determination. Along the east side at DP6 near the fence, elevation changes associated with the berm formed the boundary. Along the northern side of W4, the boundary was formed by the road embankment and the western boundary was formed by a gentle rise to the terrace to the west. The southern boundary of W4 was determined by changes in the plant community in transition to uplands. Topographic changes were not as evident in the mostly level terrain here.

Wetland 5 included a portion of the eastern end of the vacated drainage ditch. Topography also played an important role in the boundary determination as the western slope of the floodplain rose two to three feet and a transition to upland vegetation determined the boundary. Upland vegetation at DP11 was dominated by Kentucky blue grass. Wetland hydrology indicators were absent at DP11.

#### (d) Wetlands 6 and 7 (PEM1A/Type 1)

During the June field work, lands within Area E were examined. Area E consists of land at the southern end of the primary runways and a narrow ribbon designated for a perimeter road from Taxiway E1 to the hangar access road on the east side of the Airport. During the September visit, additional areas were examined (Area H) beyond the original AOI to include options for perimeter road alignments through this area as well as to assess more fully the status of a previously mapped wetland. This previously mapped wetland, shown as a large area of PEM1A/Type 1 wetland on wetland mapping (see Aquatic Resources Map in Appendix B), is situated just south of the Runway 32R blastpad between the hangar access road on the east and the Airport fence on the west.

At the June field visit, the proposed perimeter road connection (and all area within Area E) was examined and Wetlands 1 and 2 were delineated. A concave area with wetland vegetation including spike rush, smartweed, and dark green bulrush was observed near the western fence line but was not delineated at that time. This area likely is associated with Wetland 6.

Delineation of Wetlands 6 and 7 occurred during the September field visit while examining lands within Area H. To assess the status of the previously mapped Type 1 wetland, an east-to-west sampling transect consisting of four data points was taken through the area. This second site visit also enabled the examination of Wetlands 1 and 2 under late season conditions.

#### General Site Observations

This area is currently managed with regular mowing and consists mostly of grasses and upland forbs. Historically, this area often shows vegetative signatures consistent with a scrub-shrub plant community in aerial photos (1945, 1956, 1962, 1967, and 1971). Starting in 1991, the area exhibits signs of vegetative management and an absence of the scrub-shrub community (see Appendix C).

No mower ruts or other evidence of poor drainage that could inhibit tractor operation was observed. Maintenance personnel indicated that mowing equipment did not experience issues with getting bogged down or stuck at any time during management activities. The area had been mown about one week prior to field work.

In several sampling points, soils exhibited signs of disturbance, either as fill layers over native soils or as a mixture of debris including glass, pottery, and nails or other iron materials.

Given these conditions – a likely alteration of hydrology due to grading and filling, regular vegetation management, and other potential soil disturbance – normal circumstances were not considered to be present in both wetlands.

A heavy rainfall event occurred four days prior to the start of the September field work when approximately 4.5 inches of rain fell. At the time of the site visit, standing water and saturation at the surface was observed in both Wetlands 6 and 7. Generally, the larger area south of the Runway 32L and 32R ends is a closed flat area with no external outlets; thus, this area serves a groundwater infiltration function.

Five sampling points on two transects were taken within Wetland 6 (DP12 – 16) and three sampling points on a transect within Wetland 7 (DP17 – 19). The locations of these points are shown on the Wetland Boundary Maps provided in Appendix E; data sheets along with field photographs are presented in Appendices F and G. The complex topography is shown on the detailed topography map in Appendix B.

#### Vegetation

Wetlands 6 and 7 (W6 and W7) are emergent wetland communities located at the southern end of the Airport between the hangar access road (Scott Avenue North) and the western fence line. Wetland 6 is shallow basin adjacent to and west of Wetland 2 with a slight topographic rise separating them; Wetland 7 is a shallow basin/swale situated along the toe of the grading slope of the Runway 32R blast pad.

Due to mowing and late season vegetation changes leading to the introduction of annuals, hydrophytic vegetation was difficult to assess and was considered obscured. A mix of annual grasses and forbs were identifiable at DP13 (Wetland 6) including crabgrass (*Digitaria ischaemum*: FACU), barnyard grass (*Echinocloa muricata*: OBL), and lady's-thumb (*Persicaria maculosa*: FAC) complementing perennial quackgrass (*Elymus repens*: FACU) and Kentucky blue grass. This assemblage passed the Prevalence Index at 2.9.



At the other wetland sampling point within Wetland 6 (DP15), the vegetation was again obscured not only by mowing but by cut grass material that effectively acted as a mulch to suppress growth. Vegetation was dominated by crabgrass at this point along with other facultative and upland species such as creeping charlie (*Glechoma hederacea:* FACU), quackgrass, lady's-thumb, and meadow foxtail (*Alopecurus pratensis*: FAC). Barnyard grass (OBL) was also present.

As well, a concave area with wetland vegetation including spike rush, smartweed, and dark green bulrush was observed near the western fence line but was not delineated at the June field visit. This likely is associated with Wetland 6 in the general vicinity of DP15.

Given the satisfaction of both the hydric soils and wetland hydrology criteria at this sampling point, potential late season vegetation shifts, the lack of nearby or suitable reference sites, and the converging landform as evidenced by the shallow basin, hydrophytic vegetation was considered to be present at DP15.

Vegetation at Wetland 7 exhibited a similar situation at sampling point DP18: annuals such as barnyard grass and lady's-thumb dominated. Quackgrass and meadow foxtail joined as dominants. This complement of plants passed the Prevalence Index at 2.9.

#### Hydrology

Both wetlands exhibited multiple primary and secondary wetland hydrology indicators including Surface Water (A1), High Water Table (A2), Saturation (A3), and Geomorphic Position (D2). See sampling points DP13, 15, and 18. Pockets of standing water and saturation at the surface were present throughout both wetlands.

#### Soils

Soils mapped in this portion of Area E are Seelyeville and Markey soils (depressional, 0 to 1 percent slopes), a soil unit rated as hydric, Duelm loamy sand (0 to 2 percent slopes), and Udorthents (wet substratum, 0 to 2 percent slopes), both rated as not hydric. Delineated wetlands fall primarily on Seelyeville and Markey soils. This thick black mucky soil layer was evident throughout numerous sampling points, sometimes occurring at the surface or at times covered by up to 16 inches of sandy or loamy fill soil.

Within Wetland 6, sampling points DP13 and 15 show a black (10YR 2/1) muck layer. The deep black muck layer at DP15 is found at the surface and meets the Thick Dark Surface (A12) indicator while at DP13 the layer has been covered by a very dark grayish brown (10YR 3/2) sand layer to 16 inches in depth. The sandy top layer exhibited yellowish red (5YR 5/6) redoximorphic features and satisfied the Sandy Redox (S5) indicator.

Similarly, at wetland sampling point DP18 within Wetland 7, the deep 22-inch thick black (10YR 2/1) muck layer, found at the surface, satisfied the Thick Dark Surface (A12) indicator.

#### Wetland Boundary

The wetland boundary was determined by a transition to a plant community dominated by upland species, a lack of wetland hydrology indicators, and changes in elevation. In uplands, the plant community shifted to one dominated by Kentucky blue grass, quackgrass (*Elymus repens*: FACU), and crabgrass (*Digitaria ischaemum*: FACU). White clover (*Trifolium repens*: FACU), dandelion (*Taraxacum officinale*: FACU), and plantain (*Plantago major*: FACU) entered the upland plant community as minor components.

Indicators of wetland hydrology were generally lacking at upland sampling points associated with Wetlands 6 and 7 except for DP14 where a High Water Table (A2) and Saturation (A3) were present. The hydric soils criterion was satisfied at several upland sampling points (DPs 14, 16, and 19), often being the only wetland parameter satisfied.

Soils in uplands showed evidence of mixing, deposition of debris, trash, and other sandy fill materials over the native Seelyeville and Markey soils. This can be seen at upland sampling points DP12 and DP14, associated with Wetland 6, where the native soil is found at 20 and 22 inches in depth, respectively. At DP16, also associated with W6, the original muck layer was found at 11 inches in depth.

Located on the north side of Wetland 7, DP17 (upland) shows mixed soils to a depth of 20 inches, likely related to the grading for the Runway 32R blastpad. While at DP19 (upland) on the south side of the wetland, the hydric soils criterion satisfied the Redox Dark Surface (F6) hydric soils indicator. The native muck layer was found at 10 inches in depth here.

Topography played a key role in determining the boundary. A topographic rise of about two feet along the west and south sides of Wetland 6 aided in boundary determination. Along the east side of Wetland 6 topographic changes were more gradual. Along the northern side of W7, the boundary was formed at the toe of the grade slope and the southern boundary was formed by an absence of hydrophytic vegetation and a lack of hydrology. Both wetlands were found in low spots within the generally flat terrain enabling the collection of surface runoff.

#### (e) Re-examination of Wetlands 1 and 2

Re-examination of Wetlands 1 and 2 occurred during the September field visit. These wetlands consistently show wetness signatures in historic aerial photography as previously mentioned. At the September field visit, standing water was present within the two areas, both of which showed brown senescent vegetation corresponding to the delineated wetlands. Photo 34 (Appendix G) illustrates the vegetative conditions at Wetland 2 in the foreground and Wetland 1 in the background.

#### (f) Examination of Previously Mapped Wetland

During the September field visit, the large previously mapped area of PEM1A/Type 1 wetland was examined. Four sampling points (DP22 – 25), taken on an east-to-west transect, documented conditions within the area.

The terrain is generally flat in this area with elevation varying by one to two feet over this large expanse (see Detailed Topographic mapping in Appendix B).

Duelm loamy sand underlies the easternmost sampling point (DP22) where the hydric soils criterion was satisfied with a very dark gray (10YR 3/1) sandy loam layer over a very dark gray (10YR 3/1) sandy loam layer with reddish brown (5YR 4/4) redoximorphic features. This was the only wetland parameter satisfied here; both the hydrophytic vegetation and wetland hydrology criteria were not met at DP22.

Sampling points DP23 – 25 all were taken within the Seelyeville/Markey soils unit. Evidence of this layer, though, was not uncovered. At DP23 and 24, a hard pan restrictive layer encountered at 6 and 16 inches in depth, respectively, precluded digging below 16 inches at these locations. A very dark gray (10YR 3/1) sandy loam or sands with strong brown (7.5YR 4/6) or dark reddish brown (5YR 3/4) redox features satisfied the hydric soils criterion at these points. Saturation (A3) was present at 12 inches in depth at DP24. At neither point was the hydrophytic vegetation criterion satisfied.

The last point on this transect (DP25) did not meet the hydrophytic vegetation criterion but did satisfy both the wetland hydrology and hydric soils criteria with Saturation (A3) at 12 inches and Sandy Redox (S5) and Redox Dark Surface (F6). The soil profile showed both a depleted dark gray (10YR 4/1) sandy matrix with strong brown (7.5YR 4/6) redox features and very dark gray (10YR 3/1) sandy loam layer with dark reddish brown (5YR 3/4) redox features.

In all four data points, the hydrophytic vegetation criterion was not satisfied as Kentucky blue grass, white clover, crabgrass, and quackgrass dominated. Historic aerial imagery indicates that this area was at one time likely a scrub-shrub wetland. However, these four sampling points provide evidence that most of this area does not meet all three wetland criteria currently.

# C. Uplands

Uplands within the AOI consisted primarily of managed landscapes with a mixture of grasses and forbs. Dominant upland vegetation included Kentucky blue grass and tall rye grass. Other species seen in infield Areas A, B, C, D, and F included poverty grass (*Dichanthelium* sp.), smooth brome (*Bromus inermis*: FACU), silverleaf cinquefoil (*Potentilla argentea*: FACU), great and woolly plantain (*Plantago major*: FACU and *Plantago patagonica*: UPL), common yarrow (*Achillea millifolium*: FACU), yellow wood sorrel (*Oxalis stricta*: FACU), and chickweed (*Stellaria meadia*: FACU). Transition to upland was marked by a lack of wetland hydrology and absence of hydric soils in many cases.

## D. Summary

In summary, the AOI is primarily covered by Urban land, loamy sand, and sandy loam soils, with most areas in managed landscapes. Seven wetlands were identified within or near the AOI under primarily atypical conditions. Twenty-five (25) sampling points document conditions within the AOI. The wetland boundary was determined by the observation of multiple secondary indicators of wetland hydrology associated with wetland vegetation on soils exhibiting Sandy Redox (S5), Thick Dark Surface (A12), and

Redox Dark Surface (F6) in isolated depressional basins. Wetland hydrology during the June field visit was indicated by multiple secondary indicators observed as Geomorphic Position (D2), positive FAC-Neutral Test (D5), and Saturation Visible on Aerial Imagery (C9). At the late fall field visit in September, hydrology was present as primary indicators of Surface Water (A1), High Water Table (A2), and Saturation (A3). The boundary determinations primarily relied on the absence of one or more wetland criteria: lack of hydrophytic vegetation, wetland hydrology indicators, and hydric soils.

A transect of four sampling points within a previously mapped area of PEM1A/Type 1 wetland south of the primary runways documented upland conditions that do not meet all three wetland criteria currently.

#### (1) Other waters

This AOI does not include any intermittent or perennial streams or navigable waters. No other water bodies were identified during the delineation.

# 4. Conclusion

A total of seven separate wetland boundaries enclosing 0.642 acres were delineated within or near the AOI at Crystal Airport. A jurisdictional determination for these wetlands will be needed from the U.S. Corps of Engineers (USACE) as they may be considered isolated water bodies. A Section 404 wetland fill permit from the USACE will be needed for any construction activities within the jurisdictional wetland boundaries. A Section 401 water quality certification of the 404 permit will also be required by the Minnesota Pollution Control Agency, and additional permits may be required from the Local Government Unit (LGU) under the Minnesota Wetland Conservation Act. Independent review by local land use authorities may also be required. Final authority over the project rests with the above federal, state, and local agencies.

# 5. Certification and Limitations

The undersigned does hereby certify and state that she is an employee of Mead & Hunt, Inc., that she has been designated as being in responsible charge of the delineation of wetlands described herein; and that this delineation was performed in accordance with the USACE 1987 *Wetland Delineation Manual* as enhanced by the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region* (U.S. Army Corps of Engineers, 2011).

This wetland delineation report documents vegetation, soils, and hydrology conditions on the abovereferenced parcel according to these standard accepted practices, and the wetland boundary so established is valid only for the designated area. No uses or interpretations of wetland conditions or boundaries outside of the work area are supported by this work.

The mapped wetland boundaries are valid under the environmental conditions existing at the time of delineation. The user of this information is hereby notified that changing environmental conditions may affect the future validity of the wetland boundary.

MEAD & HUNT, Inc.

Roma Hatzell

Brauna Hartzell Wetland Ecologist & GIS Analyst

Date: May 2019

# 6. References

The following data sources were examined prior to fieldwork:

- Google Earth. Historical Aerial Images, Google Inc.
- Lichvar, R.W., D. L. Banks, W. N. Kirchner, and N. C. Melvin, 2016. State of Wisconsin 2016 Wetland Plant List. The National Wetland Plant List: 2016 wetland ratings, version 3.3. Phytoneuron 2016-30:1-17. Published 28 April 2016. <u>http://wetland\_plants.usace.army.mil/.</u>
- MnGEO Geospatial Image Service. Minnesota Geospatial Information Office, Saint Paul, Minnesota. Accessed at <u>http://geoint.lmic.state.mn.us/cgi-bin/wms</u>.
- National Wetlands Inventory (with Minnesota Update) from the U.S. Fish and Wildlife Service at https://www.fws.gov/wetlands/data/mapper.html.
- Soils Survey of Hennepin County, MN, 2004. U.S. Department of Agriculture (USDA), Natural Resources Conservation Service, Web Soil Survey available online at <u>http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx</u>.
- U.S. Army Corps of Engineers, 2011. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0), ed. J.S. Wakely, R.W. Lichvar, C.V. Noble, and J. F. Berkowitz. ERDC/EL TR-12-1. Vicksburg, MS: U.S. Army Engineer Research and Development Center.
- U.S. Army Corps of Engineers, 2016. *Guidance for Offsite Hydrology/Wetland Determinations*. USACE, St. Paul District and Minnesota Board of Water and Soil Resources. Minneapolis, MN.
- U.S. Department of Agriculture, Natural Resource Conservation Service (USDA, NRCS), 2016. *Field Indicators of Hydric Soils in the United States*, Version 8.0, ed. L.M. Vasilas, G.W. Hurt, and J.F. Berkowitz. USDA, NRCS in cooperation with the National Technical Committee for Hydric Soils.
- University of Minnesota Libraries, Minnesota Historical Aerial Photographs Online available online at <u>https://www.lib.umn.edu/apps/mhapo/.</u>

Appendix A. Project Location and Topography Map



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2,000

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#### CRYSTAL AIRPORT Proposed Airfield Improvements



Appendix B.Detailed Topographic Map, NRCS Soils Map, AquaticResources Map, and Minnesota Public Waters Map





# **Detailed Topography Map**

**CRYSTAL AIRPORT** Proposed Airfield Improvements

#### Legend



## **Contour Elevation**

— Index

----- Intermediate



Note: Contour interval is 2 feet.

## **Project Information**

T118N, R21W, Section 4 and T119N, R21W, Section 33 Cities of Brooklyn Park, Brooklyn Center, and Crystal Hennepin County, MN LRR subregion: K USACE Regional Supplement: NC/NE Area of Interest = 50.1 acres Field work conducted: June 4 -5 and Sept. 24 - 26, 2018

# Mead &

#### Contour Source:

Hennepin County GIS Office, Data derrived from Minnesota Department of Natural Resources LiDAR, 2012

Image Source: MnGEO WMS Image Service, Hennepin County (2016 color 7-county)



National Cooperative Soil Survey

**Conservation Service** 

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# Hydric Rating by Map Unit

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
D10A	Forada sandy loam, 0 to 2 percent slopes	85	59.8	13.9%
D17A	Duelm loamy sand, 0 to 2 percent slopes	7	55.2	12.8%
D30A	Seelyeville and Markey soils, depressional, 0 to 1 percent slopes	100	31.6	7.3%
D31A	Urban land-Duelm complex, 0 to 2 percent slopes	5	27.8	6.4%
D64B	Urban land-Hubbard complex, Mississippi River Valley, 0 to 8 percent slopes	0	38.6	8.9%
D67B	Hubbard loamy sand, 1 to 6 percent slopes	3	52.0	12.0%
M-W	Water, miscellaneous	0	1.1	0.2%
U1A	Urban land-Udorthents, wet substratum, complex, 0 to 2 percent slopes	0	22.2	5.1%
U2A	Udorthents, wet substratum, 0 to 2 percent slopes	0	69.5	16.1%
U3B	Udorthents (cut and fill land), 0 to 6 percent slopes	0	36.5	8.4%
U4A	Urban land- Udipsamments (cut and fill land) complex, 0 to 2 percent slopes	0	37.8	8.7%
Totals for Area of Inter	rest		432.1	100.0%


Conservation Service

Web Soil Survey National Cooperative Soil Survey



USDA

## Hydric Rating by Map Unit

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
D10A	Forada sandy loam, 0 to 2 percent slopes	85	11.3	22.5%
D17A	Duelm loamy sand, 0 to 2 percent slopes	7	6.7	13.4%
D30A	Seelyeville and Markey soils, depressional, 0 to 1 percent slopes	100	4.8	9.5%
D31A	Urban land-Duelm complex, 0 to 2 percent slopes	5	1.2	2.4%
D64B	Urban land-Hubbard complex, Mississippi River Valley, 0 to 8 percent slopes	0	2.6	5.3%
D67B	Hubbard loamy sand, 1 to 6 percent slopes	3	2.2	4.4%
M-W	Water, miscellaneous	0	0.1	0.2%
U1A	Urban land-Udorthents, wet substratum, complex, 0 to 2 percent slopes	0	2.1	4.1%
U2A	Udorthents, wet substratum, 0 to 2 percent slopes	0	9.9	19.7%
U3B	Udorthents (cut and fill land), 0 to 6 percent slopes	0	8.0	16.0%
U4A	Urban land- Udipsamments (cut and fill land) complex, 0 to 2 percent slopes	0	1.2	2.4%
Totals for Area of Inter	rest	·	50.1	100.0%

### Description

This rating indicates the percentage of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is rated based on its respective components and the percentage of each component within the map unit.

The thematic map is color coded based on the composition of hydric components. The five color classes are separated as 100 percent hydric components, 66 to 99 percent hydric components, 33 to 65 percent hydric components, 1 to 32 percent hydric components, and less than one percent hydric components.

In Web Soil Survey, the Summary by Map Unit table that is displayed below the map pane contains a column named 'Rating'. In this column the percentage of each map unit that is classified as hydric is displayed.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

#### References:

Federal Register. July 13, 1994. Changes in hydric soils of the United States. Federal Register. September 18, 2002. Hydric soils of the United States. Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

### **Rating Options**

Aggregation Method: Percent Present Component Percent Cutoff: None Specified Tie-break Rule: Lower



## Hydric Soil List - All Components

This table lists the map unit components and their hydric status in the survey area. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; Hurt and others, 2002).

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; U.S. Army Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). Criteria for all of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils, under natural conditions, are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

Map units that are dominantly made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units dominantly made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

The criteria for hydric soils are represented by codes in the table (for example, 2). Definitions for the codes are as follows:

- 1. All Histels except for Folistels, and Histosols except for Folists.
- 2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, Pachic subgroups, or Cumulic subgroups that:
  - A. Based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or
  - B. Show evidence that the soil meets the definition of a hydric soil;
- 3. Soils that are frequently ponded for long or very long duration during the growing season.
  - A. Based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or
  - B. Show evidence that the soil meets the definition of a hydric soil;
- 4. Map unit components that are frequently flooded for long duration or very long duration during the growing season that:
  - A. Based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or
  - B. Show evidence that the soil meets the definition of a hydric soil;

Hydric Condition: Food Security Act information regarding the ability to grow a commodity crop without removing woody vegetation or manipulating hydrology.

#### References:

- Federal Register. July 13, 1994. Changes in hydric soils of the United States.Federal Register. Doc. 2012-4733 Filed 2-28-12. February, 28, 2012. Hydric soils of the United States.
- Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.
- Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.
- Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.
- Vasilas, L.M., G.W. Hurt, and C.V. Noble, editors. Version 7.0, 2010. Field indicators of hydric soils in the United States.

## **Report—Hydric Soil List - All Components**

Hydric	Soil List - All Compon	ents-MN05	3-Hennepin County, Mi	nnesota	
Map symbol and map unit name	Component/Local Phase	Comp. pct.	Landform	Hydric status	Hydric criteria met (code)
D10A: Forada sandy loam, 0 to 2 percent slopes	Forada	60-90	Flats,stream terraces	Yes	2
	Oylen	5-15	Flats,stream terraces	No	-
	Leafriver-Frequently ponded	3-10	Depressions,stream terraces	Yes	2,3
	Arvilla	1-8	Flats,stream terraces	No	—
	Marysland	1-7	Flats, stream terraces	Yes	2
D17A: Duelm loamy sand, 0 to 2 percent slopes	Duelm	70-90	Flats	No	—
	Glendorado	5-15	Flats	No	—
	Isan	2-7	Swales	Yes	2
	Hubbard	2-5	Hillslopes	No	—
	Isan-Frequently ponded	1-3	Depressions	Yes	2,3
D30A: Seelyeville and Markey soils, depressional, 0 to 1 percent slopes	Markey-Surface drained	0-100	Depressions on stream terraces	Yes	1,3
	Seelyeville-Surface drained	0-100	Depressions on stream terraces	Yes	1,3
	Mineral soil-Surface drained	0-20	Depressions on stream terraces	Yes	2,3
D31A: Urban land-Duelm complex, 0 to 2 percent slopes	Urban land	35-80	Stream terraces	—	-
	Duelm	0-20	Stream terraces	No	—
	Isan	0-5	Swales on stream terraces	Yes	2
	Hubbard	0-5	Stream terraces	No	—
D64B: Urban land-Hubbard complex, Mississippi River Valley, 0 to 8 percent slopes	Urban land	65-85	Stream terraces	_	-
	Hubbard-Terrace	15-30	Stream terraces	No	—
	Mosford	0-5	Stream terraces	No	—
D67B: Hubbard loamy sand, 1 to 6 percent slopes	Hubbard	70-95	Stream terraces,hillslopes	No	-
	Mosford	2-10	Stream terraces,hillslopes	No	-
	Duelm	3-10	Flats, stream terraces	No	_
	Isan	0-5	Swales,stream terraces	Yes	2
	Nymore	0-5	Stream terraces,hillslopes	No	_

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8/6/2018

Hydric	Soil List - All Compone	ents-MN05	3-Hennepin County, Mir	nnesota	
Map symbol and map unit name	Component/Local Phase	Comp. pct.	Landform	Hydric status	Hydric criteria met (code)
M-W: Water, miscellaneous	Water-Miscellaneous	100	—	_	—
U1A: Urban land-Udorthents, wet substratum, complex, 0 to 2 percent slopes	Urban land	65-90	Outwash plains,moraines,stre am terraces	_	_
	Udorthents-Wet substratum	10-35	Outwash plains,moraines,stre am terraces	—	—
U2A: Udorthents, wet substratum, 0 to 2 percent slopes	Udorthents-Wet substratum	100	Outwash plains,moraines,stre am terraces	_	
U3B: Udorthents (cut and fill land), 0 to 6 percent slopes	Udorthents-Loamy (cut and fill land)	100	Moraines	_	—
U4A: Urban land-Udipsamments (cut and fill land) complex, 0 to 2 percent slopes	Urban land	65-85	Outwash plains,stream terraces	_	_
	Udipsamments-Cut and fill land	15-50	Outwash plains,stream terraces	_	_

### **Data Source Information**

Soil Survey Area: Hennepin County, Minnesota Survey Area Data: Version 13, Oct 4, 2017



## **Aquatic Resources Map**

National Wetlands Inventory (NWI) and Minnesota Public Waters

CRYSTAL AIRPORT Proposed Airfield Improvements

Legend
Project Area of Interest
Airport Boundary
PUBLIC WATERCOURSES**
Public Water Watercourse
Public Ditch/Altered Natural Watercourse
MNPublic Waters Basins
WETLAND TYPE*
Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond

\* Labeled with NWI classificaiton and Circular 39 Type



#### **Project Information**

T118N, R21W, Section 4 and T119N, R21W, Section 33 Cities of Brooklyn Park, Brooklyn Center, and Crystal Hennepin County, MN LRR subregion: K USACE Regional Supplement: NC/NE Area of Interest = 50.1 acres Field work conducted: June 4 -5 and Sept. 24 - 26, 2018



\* National Wetland Inventory Update for Minnesota, 2010-2011 MN Geospatial Commons

\*\* **Mn Public Waters Data:** Public Waters (PW) Basin and Watercourse Delineations, Hennepin County, MN Geospatial Commons

Image Source: MnGEO WMS Image Service, Hennepin County (2016 color 7-county)



Appendix C. Historic Aerial Photography



**Historic Aerial Imagery** 

Image Date: April 2018 Image Source: Google Earth

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**Historic Aerial Imagery** 

Image Date: April 2017 Image Source: Google Earth

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**Historic Aerial Imagery** 

CRYSTAL AIRPORT Proposed Airfield Improvements



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Image Date: 8/31/2017 Image Source: NAIP (MNGeo WMS service)



**Historic Aerial Imagery** 

Image Date: April 2016 Image Source: Google Earth

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CRYSTAL AIRPORT Proposed Airfield Improvements



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Image Date: 9/27/2015 Image Source: NAIP (MNGeo WMS service)



**Historic Aerial Imagery** 

CRYSTAL AIRPORT Proposed Airfield Improvements



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Image Date: 7/12/2013 Image Source: NAIP (MNGeo WMS service)



Historic Aerial Imagery

**CRYSTAL AIRPORT** Proposed Airfield Improvements



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**Historic Aerial Imagery** 

CRYSTAL AIRPORT Proposed Airfield Improvements



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Image Date: 9/12/2010 Image Source: NAIP (MNGeo WMS service)



**Historic Aerial Imagery** 



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**CRYSTAL AIRPORT** Proposed Airfield Improvements



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Image Date: Spring 2000 Image Source: Hennepin County, bw 7-county (MNGeo WMS service)



CRYSTAL AIRPORT Proposed Airfield Improvements



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Image Date: Spring 1997 Image Source: Hennepin County, bw 7-county (MNGeo WMS service)



CRYSTAL AIRPORT Proposed Airfield Improvements



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Image Date: Spring 1991 Image Source: Hennepin County, bw USGS (MNGeo WMS service)



CRYSTAL AIRPORT Proposed Airfield Improvements



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Image Date: November 1971 Image Source: University of Minnesota, Online Historic Aerial Photos



**Historic Aerial Imagery** 

**CRYSTAL AIRPORT** Proposed Airfield Improvements



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Image Date: November 1967 Image Source: University of Minnesota, Online Historic Aerial Photos





**CRYSTAL AIRPORT** Proposed Airfield Improvements



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**Historic Aerial Imagery** 

CRYSTAL AIRPORT Proposed Airfield Improvements



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**CRYSTAL AIRPORT** Proposed Airfield Improvements



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Image Date: 1945 (Photo Date Unknown) Image Source: University of Minnesota, Online Historic Aerial Photos Appendix D. WETS Analysis and Climatic Data

# Minnesota State Climatology Office

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## **Precipitation Worksheet Using Gridded Database**

#### Precipitation data for target wetland location:

county: Hennepin township name: Brooklyn Center nearest community: Brooklyn Center township number: **118N** range number: **21W** section number: **4** 

#### Aerial photograph or site visit date: Tuesday, September 25, 2018

#### Score using 1981-2010 normal period

values are in inches A 'R' following a monthly total indicates a provisional value derived from radar-based estimates.	first prior month: August 2018	second prior month: July 2018	third prior month: June 2018
estimated precipitation total for this location:	3.64R	3.44R	4.23
there is a 30% chance this location will have less than:	3.44	2.84	3.54
there is a 30% chance this location will have more than:	5.17	4.82	5.78
type of month: dry normal wet	normal	normal	normal
monthly score	3 * 2 = 6	2 * 2 = 4	1 * 2 = 2
multi-month score:           6 to 9 (dry)         10 to 14 (normal)         15 to 18 (wet)		12 (Normal)	

#### **Other Resources:**

- retrieve daily precipitation data
- view radar-based precipitation estimates
- view weekly precipitation maps
- Evaluating Antecedent Precipitation Conditions (BWSR)

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## **Precipitation Worksheet Using Gridded Database**

#### Precipitation data for target wetland location:

county: Hennepin township name: Brooklyn Center nearest community: Brooklyn Center section nu

township number: 118N range number: 21W section number: 4

Aerial photograph or site visit date: Monday, June 4, 2018

#### Score using 1981-2010 normal period

values are in inches A 'R' following a monthly total indicates a provisional value derived from radar- based estimates.	first prior month: May 2018	second prior month: April 2018	third prior month: March 2018
estimated precipitation total for this location:	2.49R	2.90R	1.31
there is a 30% chance this location will have less than:	2.89	2.21	1.38
there is a 30% chance this location will have more than:	4.88	3.29	2.04
type of month: dry normal wet	dry	normal	dry
monthly score	3 * <mark>1</mark> = 3	2 * 2 = 4	1 * 1 = 1
multi-month score: 6 to 9 (dry) 10 to 14 (normal) 15 to 18 (wet)		8 (Dry)	

#### **Other Resources:**

- retrieve daily precipitation data
- view radar-based precipitation estimates
- view weekly precipitation maps
- Evaluating Antecedent Precipitation Conditions (BWSR)

Climatological Data for BROOKLYN CENTER 1.1 E, MN (CoCoRaHS) - September 2018

Date	Max Temperature	Min Temperature	Avg Temperature	GDD Base 40	GDD Base 50	Precipitation	Snowfall	Snow Depth
2018-09-01	М	М	М	М	М	0.00	0.0	М
2018-09-02	М	М	М	М	М	0.00	М	М
2018-09-03	М	М	М	М	М	0.12	М	М
2018-09-04	М	М	М	М	М	0.02	М	М
2018-09-05	М	М	М	М	М	0.84	М	М
2018-09-06	М	М	М	М	М	0.00	0.0	М
2018-09-07	М	М	М	М	М	0.00	0.0	М
2018-09-08	М	М	М	М	М	0.00	0.0	М
2018-09-09	М	М	М	М	М	0.00	0.0	М
2018-09-10	М	М	М	М	М	0.00	0.0	М
2018-09-11	М	М	М	М	М	0.00	0.0	М
2018-09-12	М	М	М	М	М	0.00	0.0	М
2018-09-13	М	М	М	М	М	0.00	0.0	М
2018-09-14	М	М	М	М	М	0.00	0.0	М
2018-09-15	М	М	М	М	М	0.00	0.0	М
2018-09-16	М	М	М	М	М	0.00	0.0	М
2018-09-17	М	М	М	М	М	0.00	0.0	М
2018-09-18	М	М	М	М	М	0.47	М	М
2018-09-19	М	М	М	М	М	0.02	М	М
2018-09-20	М	М	М	М	М	0.15	М	М
2018-09-21	М	М	М	М	М	4.47	М	М
2018-09-22	М	М	М	М	М	0.00	М	М
2018-09-23	М	М	М	М	М	0.00	0.0	М
2018-09-24	М	М	М	М	М	0.00	0.0	М
2018-09-25	М	М	М	М	М	0.29	М	М
2018-09-26	М	М	М	М	М	0.07	М	М
2018-09-27	М	М	М	М	М	0.00	0.0	М
2018-09-28	М	М	М	М	М	0.00	0.0	М
2018-09-29	М	М	М	М	М	0.00	0.0	М
2018-09-30	М	М	М	М	М	0.00	0.0	М
Average Sum	М	М	М	М	М	6.45	0.0	М

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## Wetland Delineation Precipitation Data Retrieval from a Gridded Database

Obtaining a long-term precipitation data time-series for wetland delineation efforts can be a difficult and time-consuming process. Locating the nearest precipitation monitoring station to the wetland often proves challenging. Once a nearby monitoring location is identified, retrieving the data, accounting for gaps in the record, and generating the summary statistics can provide further challenges.

By offering access to "synthetic" data, this application assists users in overcoming some the challenges inherent in assembling a precipitation data set. The synthetic data are made up of regularly-spaced grid nodes whose values were calculated using data interpolated from Minnesota's outstanding, but spatially and temporally irregular, precipitation data base.

Click to learn more about Precipitation Grids.

#### select a wetland location

Precipitation data for target wet	land location:	To create a <b>precipitation documentation worksheet</b> using
county: Hennepin	township number:	the three-prior-month (NRCS) method, select the date of the
township name: Brooklyn	118N	site visit or aerial photograph and click on "create
Center	range number: 21W	worksheet".
nearest community: <b>Brooklyn</b> Center	section number: 4	2018 ✓ September ✓ 25 ✓ create worksheet

#### precipitation totals are in inches

#### color key:

total is in lowest 30th percentile of the period-of-record distribution total is => 30th and <= 70th percentile total is in highest 30th percentile of the period-of-record distribution multi-month totals:
WARM = warm season (May thru September)
ANN = calendar year (January thru December)
WAT = water year (Oct. previous year thru Sep. present year)

A 'R' following a monthly total indicates a provisional value derived from radar-based estimates.

					Pe	eriod-of-F	Record Su	ummary S	Statistics	;					
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	WARM	ANN	WAT
30%	0.52	0.50	1.07	1.66	2.57	3.22	2.45	2.83	1.92	1.23	0.73	0.60	16.26	26.24	26.15
70%	1.08	1.21	2.03	2.78	4.61	5.49	4.39	4.39	3.87	2.77	1.91	1.32	21.46	32.91	31.91
mean	0.89	0.90	1.63	2.46	3.74	4.48	3.87	3.71	3.11	2.25	1.52	1.03	18.93	29.60	29.64
						1981-20	10 Sumn	nary Stat	istics						
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	WARM	ANN	WAT
30%	0.53	0.42	1.38	2.20	2.89	3.54	2.84	3.44	2.32	1.42	1.00	0.66	18.71	30.80	29.55
70%	1.18	0.97	2.04	3.28	4.89	5.78	4.82	5.17	3.88	3.49	2.17	1.38	22.71	34.66	35.94
mean	0.86	0.79	1.88	2.95	3.92	4.73	4.32	4.27	3.54	2.59	1.76	1.20	20.78	32.81	32.62
				<u>.</u>		Y	ear-to-Ye	ear Data							
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	WARM	ANN	WAT
2018	1.07	1.40	1.32	2.43	2.49	4.23	3.44R	3.64R							
2017	0.74	0.70	0.60	3.28	6.20	3.70	2.94	7.07	1.88	4.91	0.49	0.70	21.79	33.21	34.32
2016	0.31	0.74	1.57	3.57	2.57	2.64	7.24	8.62	7.46	3.07	2.48	1.66	28.53	41.93	43.39
2015	0.32	0.25	0.61	2.01	4.63	3.42	6.65	3.59	3.95	2.90	4.07	1.70	22.24	34.10	29.00
2014	1.11	1.32	0.82	7.26	4.30	9.76	3.42	3.17	1.48	1.20	1.30	1.07	22.13	36.21	39.23
2013	0.67	1.21	2.13	4.55	4.68	7.75	3.68	1.02	1.29	4.36	0.61	1.62	18.42	33.57	31.03
2012	0.53	1.93	1.27	2.83	9.97	4.29	4.32	1.15	0.56	1.49	0.88	1.68	20.29	30.90	28.67
2011	0.89	0.82	2.19	3.18	6.51	3.80	9.11	4.71	0.50	0.85	0.15	0.82	24.63	33.53	38.96
2010	0.56	0.80	0.88	1.94	2.96	6.17	3.30	5.67	5.41	1.84	2.30	3.11	23.51	34.94	36.41
2009	0.46	0.96	1.76	1.58	0.49	4.01	1.26	6.24	0.64	5.92	0.53	2.27	12.64	26.12	21.69
2008	0.13	0.50	2.03	3.81	2.64	4.73	2.27	2.35	2.26	1.72	1.11	1.46	14.25	25.01	28.12
2007	0.59	1.38	3.45	2.47	3.49	2.04	1.89	5.17	5.28	5.52	0.03	1.85	17.87	33.16	30.01
2006	0.52	0.44	1.93	4.14	5.62	4.38	1.19	4.36	3.86	0.68	1.04	2.53	19.41	30.69	33.99
2005	1.24	1.06	1.34	2.41	3.76	6.17	2.24	4.15	8.53	4.28	1.90	1.37	24.85	38.45	35.79
2004	0.55	1.51	2.01	2.60	6.02	5.21	3.48	1.87	5.20	3.38	1.01	0.50	21.78	33.34	31.55
2003	0.24	0.98	1.63	3.12	5.83	8.33	1.80	0.44	2.59	1.04	1.08	0.98	18.99	28.06	29.26
2002	0.56	0.55	1.98	4.32	5.28	9.17	8.83	6.05	3.94	3.99	0.08	0.23	33.27	44.98	45.51
2001	1.28	1.61	0.97	7.72	5.04	4.47	2.71	4.19	3.76	0.97	3.26	0.60	20.17	36.58	37.94
2000	0.97	1.21	1.00	1.61	3.18	3.81	6.44	4.00	2.43	0.99	3.93	1.27	19.86	30.84	26.46
1999	1.32	0.37	1.72	3.41	5.99	5.62	5.21	4.35	2.10	0.68	0.75	0.38	23.27	31.90	35.70
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	WARM	ANN	WAT
1998	1.28	0.89	4.00	2.27	4.24	4.35	2.90	5.18	1.50	3.00	1.90	0.71	18.17	32.22	29.72
1997	1.82	0.25	1.29	1.10	1.90	2.49	10.01	4.12	2.63	2.08	0.78	0.25	21.15	28.72	36.28
1996	2.18	0.34	1.71	0.84	4.62	4.02	1.81	1.43	1.82	4.11	4.84	1.72	13.70	29.44	26.18
		5.01	1	0.01											

http://climateapps.dnr.state.mn.us/gridded\_data/precip/wetland/wetland.asp

1995	0.60	0.34	2.19	2.59	4.02	7.08	4.10	8.22	2.34	5.08	1.09	1.24	25.76	38.89	37.93
1994	1.26	0.82	0.46	7.59	2.09	2.87	4.12	3.31	3.13	4.26	1.59	0.60	15.52	32.10	29.67
1993	1.42	0.39	1.32	2.85	5.70	7.14	5.89	7.42	2.91	1.47	1.88	0.67	29.06	39.06	41.30
1992	0.96	0.44	1.45	2.42	1.36	3.63	6.10	3.42	5.22	2.54	2.46	1.26	19.73	31.26	31.76
1991	0.54	1.25	2.59	4.32	9.26	3.09	6.58	5.40	8.33	1.46	4.39	0.91	32.66	48.12	45.05
1990	0.10	0.74	4.25	3.23	4.14	8.29	7.22	3.27	1.92	2.08	0.67	0.94	24.84	36.85	34.93
1989	0.45	0.71	1.82	2.41	4.11	3.18	3.78	2.75	1.33	0.47	0.98	0.32	15.15	22.31	24.74
1988	1.16	0.18	1.48	1.11	2.15	0.26	1.42	5.51	2.91	0.83	2.73	0.64	12.25	20.38	20.03
1987	0.46	0.02	0.52	0.16	2.55	1.85	12.66	3.22	1.44	0.86	2.12	0.87	21.72	26.73	25.08
1986	0.82	0.91	2.07	5.74	3.34	4.66	3.72	3.69	7.13	1.32	0.66	0.22	22.54	34.28	38.31
1985	0.62	0.27	3.13	2.56	5.08	3.34	3.19	5.37	6.14	3.63	1.46	1.14	23.12	35.93	36.58
1984	0.69	1.46	1.11	2.74	2.71	7.91	3.17	4.13	3.74	4.49	0.33	2.06	21.66	34.54	35.52
1983	0.44	0.77	2.74	2.04	3.39	5.08	4.66	4.31	2.62	2.79	3.68	1.39	20.06	33.91	35.59
1982	2.27	0.23	2.21	2.05	4.82	2.28	3.36	3.45	3.60	3.43	2.89	3.22	17.51	33.81	29.73
1981	0.22	2.23	1.40	3.45	1.80	6.20	4.33	5.04	1.57	2.80	1.45	1.21	18.94	31.70	27.85
1980	1.14	0.94	1.16	0.95	1.52	5.08	3.71	5.78	4.00	1.08	0.29	0.24	20.09	25.89	28.64
1979	1.30	1.55	2.37	0.58	4.39	5.68	2.18	5.52	2.21	2.83	1.33	0.20	19.98	30.14	28.96
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	WARM	ANN	WAT
1978	0.31	0.17	0.85	4.36	3.71	7.65	8.73	3.43	2.99	0.56	1.69	0.93	26.51	35.38	39.06
1977	0.79	0.17 1.29	4.30	2.19	2.69	4.78	3.94	5.23	3.89	4.02	1.69 1.48	1.36	20.53	35.96	30.14
1977 1976	0.79 1.23	1.29 0.63	4.30 2.35	2.19 0.81	2.69 1.09	4.78 2.76	3.94 2.40	5.23 1.47	3.89 1.27		1.48 0.14	1.36 0.40	20.53 8.99	35.96 15.05	30.14 20.56
1977 1976 1975	0.79 1.23 3.85	1.29 0.63 0.76	4.30 2.35 2.03	2.19 0.81 6.13	2.69 1.09 5.66	4.78 2.76 7.90	3.94 2.40 3.18	5.23 1.47 6.33	3.89 1.27 1.59	4.02 0.50 0.65	1.48 0.14 5.14	1.36 0.40 0.76	20.53 8.99 24.66	35.96 15.05 43.98	30.14 20.56 41.07
1977 1976 1975 1974	0.79 1.23 3.85 0.25	1.29 0.63 0.76 1.47	4.30 2.35 2.03 0.86	2.19 0.81 6.13 2.65	2.69 1.09 5.66 3.05	4.78 2.76	3.94 2.40 3.18 1.69	5.23 1.47 6.33 3.31	3.89 1.27 1.59 1.03	4.02 0.50 0.65 1.88	1.48 0.14 5.14 1.29	1.36 0.40 0.76 0.47	20.53 8.99 24.66 15.49	35.96 15.05 43.98 24.36	30.14 20.56 41.07 25.53
1977 1976 1975 1974 1973	0.79 1.23 3.85	1.29 0.63 0.76 1.47 1.22	4.30 2.35 2.03 0.86 1.40	2.19 0.81 6.13 2.65 1.42	2.69 1.09 5.66 3.05 4.57	4.78 2.76 7.90 6.41 1.64	3.94 2.40 3.18 1.69 3.14	5.23 1.47 6.33 3.31 4.22	3.89 1.27 1.59 1.03 3.15	4.02 0.50 0.65 1.88 1.04	1.48 0.14 5.14 1.29 2.34	1.36 0.40 0.76 0.47 1.43	20.53 8.99 24.66 15.49 16.72	35.96 15.05 43.98 24.36 26.94	30.14 20.56 41.07 25.53 27.03
1977 1976 1975 1974 1973 1972	0.79 1.23 3.85 0.25	1.29 0.63 0.76 1.47 1.22 0.38	4.30 2.35 2.03 0.86 1.40 1.10	2.19 0.81 6.13 2.65 1.42 1.12	2.69 1.09 5.66 3.05 4.57 2.32	4.78 2.76 7.90 6.41 1.64 3.21	3.94 2.40 3.18 1.69 3.14 6.10	5.23 1.47 6.33 3.31 4.22 4.26	3.89 1.27 1.59 1.03 3.15 2.84	4.02 0.50 0.65 1.88	1.48 0.14 5.14 1.29 2.34 1.12	1.36 0.40 0.76 0.47 1.43 1.69	20.53 8.99 24.66 15.49 16.72 18.73	35.96 15.05 43.98 24.36 26.94 27.12	30.14 20.56 41.07 25.53 27.03 31.69
1977 1976 1975 1974 1973 1972 1971	0.79 1.23 3.85 0.25 1.37 0.89 0.98	1.29 0.63 0.76 1.47 1.22 0.38 1.68	4.30 2.35 2.03 0.86 1.40 1.10 1.06	2.19 0.81 6.13 2.65 1.42 1.12 1.32	2.69 <b>1.09</b> <b>5.66</b> <b>3.05</b> <b>4.57</b> <b>2.32</b> <b>3.66</b>	4.78 2.76 7.90 6.41 1.64 3.21 4.31	3.94 2.40 3.18 1.69 3.14 6.10 3.27	5.23 1.47 6.33 3.31 4.22 4.26 2.50	3.89 1.27 1.59 1.03 3.15 2.84 3.30	4.02 0.50 0.65 1.88 1.04 2.09 6.16	1.48 0.14 5.14 1.29 2.34 1.12 2.71	1.36 0.40 0.76 0.47 1.43 1.69 0.60	20.53 8.99 24.66 15.49 16.72 18.73 17.04	35.96 15.05 43.98 24.36 26.94 27.12 31.55	30.14 20.56 41.07 25.53 27.03 31.69 31.82
1977 1976 1975 1974 1973 1972 1971 1970	0.79 1.23 3.85 0.25 1.37 0.89 0.98 0.98	1.29 0.63 0.76 1.47 1.22 0.38 1.68 0.17	4.30 2.35 2.03 0.86 1.40 1.10 1.06 1.65	2.19 0.81 6.13 2.65 1.42 1.12 1.32 3.63	2.69 1.09 5.66 3.05 4.57 2.32 3.66 5.39	4.78 2.76 7.90 6.41 1.64 3.21 4.31 2.41	3.94 2.40 3.18 1.69 3.14 6.10 3.27 4.73	5.23 1.47 6.33 3.31 4.22 4.26 2.50 2.86	3.89 1.27 1.59 1.03 3.15 2.84 3.30 3.10	4.02 0.50 0.65 1.88 1.04 2.09 6.16 5.46	1.48 0.14 5.14 1.29 2.34 1.12 2.71 3.86	1.36 0.40 0.76 0.47 1.43 1.69 0.60 0.42	20.53 8.99 24.66 15.49 16.72 18.73 17.04 18.49	35.96 15.05 43.98 24.36 26.94 27.12 31.55 34.35	30.14 20.56 41.07 25.53 27.03 31.69 31.82 30.46
197719761975197419731972197119701969	0.79 1.23 3.85 0.25 1.37 0.89 0.98 0.67 2.17	1.29 0.63 0.76 1.47 1.22 0.38 1.68 0.17 0.50	4.30 2.35 2.03 0.86 1.40 1.10 1.06 1.65 0.83	2.19 0.81 6.13 2.65 1.42 1.12 1.32 3.63 1.97	2.69 1.09 5.66 3.05 4.57 2.32 3.66 5.39 2.40	4.78 2.76 7.90 6.41 1.64 3.21 4.31 2.41 3.21	3.94 2.40 3.18 1.69 3.14 6.10 3.27 4.73 4.39	5.23 1.47 6.33 3.31 4.22 4.26 2.50 2.86 0.59	3.89 1.27 1.59 1.03 3.15 2.84 3.30 3.10 0.31	4.02 0.50 0.65 1.88 1.04 2.09 6.16 5.46 2.49	1.48 0.14 5.14 1.29 2.34 1.12 2.71 3.86 0.87	1.36 0.40 0.76 0.47 1.43 1.69 0.60 0.42 2.49	20.53 8.99 24.66 15.49 16.72 18.73 17.04 18.49 10.90	35.96 15.05 43.98 24.36 26.94 27.12 31.55 34.35 22.22	30.14 20.56 41.07 25.53 27.03 31.69 31.82 30.46 25.54
1977 1976 1975 1974 1973 1972 1971 1970 1969 1968	0.79 1.23 3.85 0.25 1.37 0.89 0.98 0.67 2.17 0.69	1.29 0.63 0.76 1.47 1.22 0.38 1.68 0.17 0.50 0.16	4.30 2.35 2.03 0.86 1.40 1.10 1.06 1.65 0.83 1.81	2.19 0.81 6.13 2.65 1.42 1.12 1.32 3.63 1.97 3.39	2.69 1.09 5.66 3.05 4.57 2.32 3.66 5.39 2.40 3.96	4.78 2.76 7.90 6.41 1.64 3.21 4.31 2.41 3.21 7.36	3.94 2.40 3.18 1.69 3.14 6.10 3.27 4.73 4.39 4.59	5.23 1.47 6.33 3.31 4.22 4.26 2.50 2.86 0.59 1.21	3.89 1.27 1.59 1.03 3.15 2.84 3.30 3.10 0.31 4.89	4.02 0.50 0.65 1.88 1.04 2.09 6.16 5.46 2.49 6.47	1.48 0.14 5.14 1.29 2.34 1.12 2.71 3.86 0.87 0.67	1.36 0.40 0.76 0.47 1.43 1.69 0.60 0.42 2.49 2.03	20.53 8.99 24.66 15.49 16.72 18.73 17.04 18.49 10.90 22.01	35.96 15.05 43.98 24.36 26.94 27.12 31.55 34.35 22.22 37.23	30.14 20.56 41.07 25.53 27.03 31.69 31.82 30.46 25.54 30.14
1977           1976           1975           1974           1973           1972           1971           1970           1969           1968           1967	0.79 1.23 3.85 0.25 1.37 0.89 0.98 0.67 2.17 0.69 3.10	1.29 0.63 0.76 1.47 1.22 0.38 1.68 0.17 0.50 0.16 1.44	4.30 2.35 2.03 0.86 1.40 1.10 1.06 1.65 0.83 1.81 0.82	2.19 0.81 6.13 2.65 1.42 1.12 1.32 3.63 1.97 3.39 2.66	2.69 1.09 5.66 3.05 4.57 2.32 3.66 5.39 2.40 3.96 1.67	4.78 2.76 7.90 6.41 1.64 3.21 4.31 2.41 3.21 7.36 7.43	3.94 2.40 3.18 1.69 3.14 6.10 3.27 4.73 4.39 4.59 1.99	5.23 1.47 6.33 3.31 4.22 4.26 2.50 2.86 0.59 1.21 3.67	3.89 1.27 1.59 1.03 3.15 2.84 3.30 3.10 0.31 4.89 0.78	4.02 0.50 0.65 1.88 1.04 2.09 6.16 5.46 2.49 6.47 1.49	1.48 0.14 5.14 1.29 2.34 1.12 2.71 3.86 0.87 0.67 0.09	$ \begin{array}{r} 1.36\\ 0.40\\ 0.76\\ 0.47\\ 1.43\\ 1.69\\ 0.60\\ 0.42\\ 2.49\\ 2.03\\ 0.50\\ \end{array} $	20.53 8.99 24.66 15.49 16.72 18.73 17.04 18.49 10.90 22.01 15.54	35.96 15.05 43.98 24.36 26.94 27.12 31.55 34.35 22.22 37.23 25.64	30.14 20.56 41.07 25.53 27.03 31.69 31.82 30.46 25.54 30.14 28.10
1977           1976           1975           1974           1973           1972           1971           1970           1969           1967           1966	0.79 1.23 3.85 0.25 1.37 0.89 0.98 0.67 2.17 0.69 3.10 0.85	1.29 0.63 0.76 1.47 1.22 0.38 1.68 0.17 0.50 0.16 1.44 1.61	4.30 2.35 2.03 0.86 1.40 1.10 1.06 1.65 0.83 1.81 0.82 2.39	2.19 0.81 6.13 2.65 1.42 1.12 1.32 3.63 1.97 3.39 2.66 1.17	2.69 1.09 5.66 3.05 4.57 2.32 3.66 5.39 2.40 3.96 1.67 1.66	4.78 2.76 7.90 6.41 1.64 3.21 4.31 2.41 3.21 7.36 7.43 3.49	3.94 2.40 3.18 1.69 3.14 6.10 3.27 4.73 4.39 4.59 1.99 2.39	5.23 1.47 6.33 3.31 4.22 4.26 2.50 2.86 0.59 1.21 3.67 4.42	3.89 1.27 1.59 1.03 3.15 2.84 3.30 3.10 0.31 4.89 0.78 2.43	4.02 0.50 0.65 1.88 1.04 2.09 6.16 5.46 2.49 6.47 1.49 3.15	1.48 0.14 5.14 1.29 2.34 1.12 2.71 3.86 0.87 0.67 0.09 0.46	1.36 0.40 0.76 0.47 1.43 1.69 0.60 0.42 2.49 2.03 0.50 0.93	20.53 8.99 24.66 15.49 16.72 18.73 17.04 18.49 10.90 22.01 15.54 14.39	35.96 15.05 43.98 24.36 26.94 27.12 31.55 34.35 22.22 37.23 25.64 24.95	30.14 20.56 41.07 25.53 27.03 31.69 31.82 30.46 25.54 30.14 28.10 25.94
1977         1976         1975         1974         1973         1972         1971         1970         1969         1968         1967         1966         1965	0.79 1.23 3.85 0.25 1.37 0.89 0.98 0.67 2.17 0.69 3.10 0.85 0.33	1.29 0.63 0.76 1.47 1.22 0.38 1.68 0.17 0.50 0.16 1.44 1.61 1.48	4.30 2.35 2.03 0.86 1.40 1.10 1.06 1.65 0.83 1.81 0.82 2.39 3.68	2.19 0.81 6.13 2.65 1.42 1.12 1.32 3.63 1.97 3.39 2.66 1.17 3.84	2.69 1.09 5.66 3.05 4.57 2.32 3.66 5.39 2.40 3.96 1.67 1.66 6.05	4.78 2.76 7.90 6.41 1.64 3.21 4.31 2.41 3.21 7.36 7.43 3.49 4.51	3.94 2.40 3.18 1.69 3.14 6.10 3.27 4.73 4.39 4.59 1.99 2.39 5.06	5.23 1.47 6.33 3.31 4.22 4.26 2.50 2.86 0.59 1.21 3.67 4.42 3.46	3.89 1.27 1.59 1.03 3.15 2.84 3.30 3.10 0.31 4.89 0.78 2.43 5.42	4.02 0.50 0.65 1.88 1.04 2.09 6.16 5.46 2.49 6.47 1.49 3.15 1.52	1.48 0.14 5.14 1.29 2.34 1.12 2.71 3.86 0.87 0.67 0.09 0.46 2.18	1.36 0.40 0.76 0.47 1.43 1.69 0.60 0.42 2.49 2.03 0.50 0.93 1.83	20.53 8.99 24.66 15.49 16.72 18.73 17.04 18.49 10.90 22.01 15.54 14.39 24.50	35.96 15.05 43.98 24.36 26.94 27.12 31.55 34.35 22.22 37.23 25.64 24.95 39.36	30.14 20.56 41.07 25.53 27.03 31.69 31.82 30.46 25.54 30.14 28.10 25.94 36.74
1977           1976           1975           1974           1973           1972           1971           1970           1969           1968           1967           1965           1964	0.79 1.23 3.85 0.25 1.37 0.89 0.98 0.67 2.17 0.69 3.10 0.85 0.33 0.39	1.29 0.63 0.76 1.47 1.22 0.38 1.68 0.17 0.50 0.16 1.44 1.61 1.48 0.07	4.30 2.35 2.03 0.86 1.40 1.10 1.06 1.65 0.83 1.81 0.82 2.39 3.68 0.95	2.19 0.81 6.13 2.65 1.42 1.12 1.32 3.63 1.97 3.39 2.66 1.17 3.84 2.94	2.69 1.09 5.66 3.05 4.57 2.32 3.66 5.39 2.40 3.96 1.67 1.66 6.05 3.57	4.78 2.76 7.90 6.41 1.64 3.21 4.31 2.41 3.21 7.36 7.43 3.49 4.51 2.87	3.94 2.40 3.18 1.69 3.14 6.10 3.27 4.73 4.39 4.59 1.99 2.39 5.06 2.30	5.23 1.47 6.33 3.31 4.22 4.26 2.50 2.86 0.59 1.21 3.67 4.42 3.46 5.88	3.89 1.27 1.59 1.03 3.15 2.84 3.30 3.10 0.31 4.89 0.78 2.43 5.42 4.33	4.02 0.50 0.65 1.88 1.04 2.09 6.16 5.46 2.49 6.47 1.49 3.15 1.52 0.54	1.48         0.14         5.14         1.29         2.34         1.12         2.71         3.86         0.87         0.67         0.09         0.46         2.18         1.33	$ \begin{array}{r} 1.36\\ 0.40\\ 0.76\\ 0.47\\ 1.43\\ 1.69\\ 0.60\\ 0.42\\ 2.49\\ 2.03\\ 0.50\\ 0.93\\ 1.83\\ 1.04 \end{array} $	20.53 8.99 24.66 15.49 16.72 18.73 17.04 18.49 10.90 22.01 15.54 14.39 24.50 18.95	35.96 15.05 43.98 24.36 26.94 27.12 31.55 34.35 22.22 37.23 25.64 24.95 39.36 26.21	30.14 20.56 41.07 25.53 27.03 31.69 31.82 30.46 25.54 30.14 28.10 25.94 36.74 25.30
1977         1976         1975         1974         1973         1972         1971         1970         1969         1968         1967         1966         1965         1964         1963	0.79 1.23 3.85 0.25 1.37 0.89 0.98 0.67 2.17 0.69 3.10 0.85 0.33 0.39 0.40	1.29 0.63 0.76 1.47 1.22 0.38 1.68 0.17 0.50 0.16 1.44 1.61 1.48 0.07 0.34	4.30 2.35 2.03 0.86 1.40 1.10 1.06 1.65 0.83 1.81 0.82 2.39 3.68 0.95 1.17	2.19 0.81 6.13 2.65 1.42 1.12 1.32 3.63 1.97 3.39 2.66 1.17 3.84 2.94 2.15	2.69 1.09 5.66 3.05 4.57 2.32 3.66 5.39 2.40 3.96 1.67 1.66 6.05 3.57 4.70	4.78 2.76 7.90 6.41 1.64 3.21 4.31 2.41 3.21 7.36 7.43 3.49 4.51 2.87 3.62	3.94 2.40 3.18 1.69 3.14 6.10 3.27 4.73 4.39 4.59 1.99 2.39 5.06 2.30 2.12	5.23 1.47 6.33 3.31 4.22 4.26 2.50 2.86 0.59 1.21 3.67 4.42 3.46 5.88 1.87	3.89 1.27 1.59 1.03 3.15 2.84 3.30 3.10 0.31 4.89 0.78 2.43 5.42 4.33 3.20	4.02 0.50 0.65 1.88 1.04 2.09 6.16 5.46 2.49 6.47 1.49 3.15 1.52 0.54 0.63	1.48 0.14 5.14 1.29 2.34 1.12 2.71 3.86 0.87 0.67 0.09 0.46 2.18 1.33 0.64	1.36 0.40 0.76 0.47 1.43 1.69 0.60 0.42 2.49 2.03 0.50 0.93 1.83 1.04 0.73	20.53 8.99 24.66 15.49 16.72 18.73 17.04 18.49 10.90 22.01 15.54 14.39 24.50 18.95 15.51	35.96 15.05 43.98 24.36 26.94 27.12 31.55 34.35 22.22 37.23 25.64 24.95 39.36 26.21 21.57	30.14 20.56 41.07 25.53 27.03 31.69 31.82 30.46 25.54 30.14 28.10 25.94 36.74 25.30 21.93
1977         1976         1975         1974         1973         1972         1971         1970         1969         1968         1967         1968         1967         1968         1967         1968         1967         1968         1965         1964         1963         1962	0.79 1.23 3.85 0.25 1.37 0.89 0.98 0.67 2.17 0.69 3.10 0.85 0.33 0.39 0.40 0.57	1.29 0.63 0.76 1.47 1.22 0.38 1.68 0.17 0.50 0.16 1.44 1.61 1.48 0.07 0.34 1.74	4.30 2.35 2.03 0.86 1.40 1.10 1.06 1.65 0.83 1.81 0.82 2.39 3.68 0.95 1.17 1.74	2.19 0.81 6.13 2.65 1.42 1.12 1.32 3.63 1.97 3.39 2.66 1.17 3.84 2.94 2.15 1.38	2.69 1.09 5.66 3.05 4.57 2.32 3.66 5.39 2.40 3.96 1.67 1.66 6.05 3.57 4.70 6.98	4.78 2.76 7.90 6.41 1.64 3.21 4.31 2.41 3.21 7.36 7.43 3.49 4.51 2.87 3.62 2.86	3.94 2.40 3.18 1.69 3.14 6.10 3.27 4.73 4.39 4.59 1.99 2.39 5.06 2.30 2.12 5.85	5.23 1.47 6.33 3.31 4.22 4.26 2.50 2.86 0.59 1.21 3.67 4.42 3.46 5.88 1.87 3.99	3.89 1.27 1.59 1.03 3.15 2.84 3.30 3.10 0.31 4.89 0.78 2.43 5.42 4.33 3.20 3.16	4.02 0.50 0.65 1.88 1.04 2.09 6.16 5.46 2.49 6.47 1.49 3.15 1.52 0.54 0.63 1.60	1.48 0.14 5.14 1.29 2.34 1.12 2.71 3.86 0.87 0.67 0.09 0.46 2.18 1.33 0.64 0.54	1.36 0.40 0.76 0.47 1.43 1.69 0.60 0.42 2.49 2.03 0.50 0.93 1.83 1.04 0.73 0.22	20.53 8.99 24.66 15.49 16.72 18.73 17.04 18.49 10.90 22.01 15.54 14.39 24.50 18.95 15.51 22.84	35.96 15.05 43.98 24.36 26.94 27.12 31.55 34.35 22.22 37.23 25.64 24.95 39.36 26.21 21.57 30.63	30.14 20.56 41.07 25.53 27.03 31.69 31.82 30.46 25.54 30.14 25.54 30.14 25.94 36.74 25.30 21.93 34.44
1977         1976         1975         1974         1973         1972         1971         1970         1969         1968         1967         1966         1965         1964         1963	0.79 1.23 3.85 0.25 1.37 0.89 0.98 0.67 2.17 0.69 3.10 0.85 0.33 0.39 0.40	1.29 0.63 0.76 1.47 1.22 0.38 1.68 0.17 0.50 0.16 1.44 1.61 1.48 0.07 0.34	4.30 2.35 2.03 0.86 1.40 1.10 1.06 1.65 0.83 1.81 0.82 2.39 3.68 0.95 1.17	2.19 0.81 6.13 2.65 1.42 1.12 1.32 3.63 1.97 3.39 2.66 1.17 3.84 2.94 2.15	2.69 1.09 5.66 3.05 4.57 2.32 3.66 5.39 2.40 3.96 1.67 1.66 6.05 3.57 4.70	4.78 2.76 7.90 6.41 1.64 3.21 4.31 2.41 3.21 7.36 7.43 3.49 4.51 2.87 3.62	3.94 2.40 3.18 1.69 3.14 6.10 3.27 4.73 4.39 4.59 1.99 2.39 5.06 2.30 2.12	5.23 1.47 6.33 3.31 4.22 4.26 2.50 2.86 0.59 1.21 3.67 4.42 3.46 5.88 1.87	3.89 1.27 1.59 1.03 3.15 2.84 3.30 3.10 0.31 4.89 0.78 2.43 5.42 4.33 3.20	4.02 0.50 0.65 1.88 1.04 2.09 6.16 5.46 2.49 6.47 1.49 3.15 1.52 0.54 0.63	1.48 0.14 5.14 1.29 2.34 1.12 2.71 3.86 0.87 0.67 0.09 0.46 2.18 1.33 0.64	1.36 0.40 0.76 0.47 1.43 1.69 0.60 0.42 2.49 2.03 0.50 0.93 1.83 1.04 0.73	20.53 8.99 24.66 15.49 16.72 18.73 17.04 18.49 10.90 22.01 15.54 14.39 24.50 18.95 15.51	35.96 15.05 43.98 24.36 26.94 27.12 31.55 34.35 22.22 37.23 25.64 24.95 39.36 26.21 21.57	30.14 20.56 41.07 25.53 27.03 31.69 31.82 30.46 25.54 30.14 28.10 25.94 36.74 25.30 21.93
1960	0.66	0.17	0.69	2.41	4.53	3.33	2.05	5.56	3.58	0.37	1.06	0.52	19.05	24.93	27.42
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1959	0.04	0.37	0.34	0.49	6.40	2.14	3.27	5.87	3.34	2.55	0.53	1.36	21.02	26.70	25.04
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	WARM	ANN	WAT
1958	0.27	0.11	0.35	2.14	1.87	2.54	2.99	4.54	1.50	1.78	0.87	0.13	13.44	19.09	19.43
1957	0.32	0.77	1.47	1.41	3.92	7.37	4.43	5.70	3.03	1.36	1.52	0.24	24.45	31.54	32.23
1956	0.62	0.16	1.40	0.71	2.86	7.00	5.34	5.53	0.80	2.13	1.53	0.15	21.53	28.23	28.09
1955	0.51	1.44	0.62	0.96	0.88	2.51	7.45	3.88	1.54	1.58	0.93	1.16	16.26	23.46	22.47
1954	0.26	0.43	1.72	4.66	3.11	4.82	2.57	3.07	3.68	1.79	0.54	0.35	17.25	27.00	28.13
1953	0.81	1.24	1.51	2.66	3.66	6.83	5.40	3.59	0.85	0.23	1.97	1.61	20.33	30.36	28.02
1952	1.08	1.18	2.63	0.70	3.28	4.86	4.76	4.93	0.40	0.03	1.07	0.37	18.23	25.29	28.73
1951	0.48	1.64	2.91	2.06	3.94	5.21	7.41	3.67	5.56	1.82	1.68	1.41	25.79	37.79	37.08
1950	1.42	0.61	2.67	2.70	3.96	1.13	3.53	1.50	1.95	1.21	1.16	1.83	12.07	23.67	23.42
1949	2.10	0.27	2.98	1.87	1.27	4.22	5.32	2.03	3.62	2.34	0.57	1.04	16.46	27.63	27.67
1948	0.20	1.86	1.55	2.05	0.74	2.94	2.53	3.71	0.99	0.84	2.37	0.78	10.91	20.56	21.10
1947	0.87	0.21	0.46	2.95	2.70	5.05	1.38	3.53	1.60	0.96	3.04	0.53	14.26	23.28	24.14
1946	0.77	1.31	1.16	0.95	3.25	6.81	2.31	0.71	5.68	2.77	1.86	0.76	18.76	28.34	26.13
1945	0.78	1.93	2.16	3.52	2.56	6.07	3.67	3.21	2.15	0.41	1.24	1.53	17.66	29.23	28.82
1944	0.50	1.30	1.43	2.53	5.67	7.18	4.17	3.53	0.89	0.16	2.35	0.26	21.44	29.97	30.81
1943	1.34	0.63	1.30	1.00	5.31	4.05	3.99	2.26	1.91	1.52	2.09	0.00	17.52	25.40	23.88
1942	0.15	0.44	2.20	3.10	7.56	2.91	3.89	2.82	7.04	0.70	0.38	1.01	24.22	32.20	36.65
1941	0.68	1.18	1.07	2.24	3.95	4.52	2.45	3.79	4.00	4.74	0.86	0.94	18.71	30.42	30.94
1940	0.37	0.93	2.23	1.39	1.97	5.74	1.93	4.29	0.37	1.77	4.16	1.13	14.30	26.28	21.63
1939	1.19	1.18	0.72	2.49	3.62	6.49	3.12	3.47	3.24	1.52	0.02	0.87	19.94	27.93	29.33
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	WARM	ANN	WAT
1938	0.85	0.72	2.19	3.43	7.92	3.26	4.05	3.65	3.30	0.83	2.11	0.87	22.18	33.18	32.17
1937	1.23	0.52	0.91	2.53	5.73	2.57	1.06	4.69	1.85	1.66	0.53	0.61	15.90	23.89	24.31
1936	0.92	1.77	2.87	1.79	2.36	1.72	0.11	2.83	1.42	0.52	0.76	1.94	8.44	19.01	21.93
1935	1.56	0.23	1.44	2.42	3.22	5.32	2.98	3.54	1.90	4.28	0.80	1.06	16.96	28.75	30.25
1934	0.85	0.17	0.80	1.22	0.26	2.65	1.34	2.07	5.26	4.28	2.02	1.34	11.58	22.26	17.43
1933	0.75	0.77	1.85	1.46	6.71	1.53	2.12	0.95	3.25	1.44	0.66	0.71	14.56	22.20	24.47
1932	1.66	0.72	1.49	2.27	2.56	2.42	4.25	3.93	0.84	1.11	2.54	1.43	14.00	25.22	26.78
1931	0.17	0.99	1.63	1.03	1.34	4.55	0.88	3.74	2.43	2.13	3.87	0.64	12.94	23.40	21.06
1930	1.06	2.24	0.59	0.58	3.67	5.79	1.80	0.99	4.00	1.47	2.72	0.11	16.25	25.02	23.97
1929	1.61	1.04	1.28	1.87	1.55	3.46	2.87	2.71	4.27	2.33	0.48	0.44	14.86	23.91	24.90
1928	0.33	1.53	0.88	2.54	2.13	3.53	3.92	5.41	2.58	3.27	0.41	0.56	17.57	27.09	29.47
1927	0.51	0.46	2.61	2.79	4.25	5.65	1.97	2.49	4.35	2.21	1.59	2.82	18.71	31.70	30.16

1926	0.91	0.62	1.48	0.53	1.22	3.85	2.91	3.80	5.52	1.75	1.93	1.40	17.30	25.92	22.78
1925	0.53	0.55	0.48	1.22	2.37	4.89	5.47	0.58	3.47	0.62	0.53	0.79	16.78	21.50	22.11
1924	0.47	0.60	1.57	4.32	1.26	6.30	1.69	8.04	3.90	0.93	0.62	1.00	21.19	30.70	29.93
1923	1.15	0.46	1.07	2.44	2.80	5.51	3.19	2.04	1.51	0.93	0.46	0.39	15.05	21.95	25.27
1922	0.83	3.38	1.87	1.41	2.56	5.08	1.67	1.72	2.24	1.24	3.73	0.13	13.27	25.86	23.44
1921	0.43	0.56	2.14	2.15	3.34	4.12	4.12	2.09	4.39	0.60	1.78	0.30	18.06	26.02	28.10
1920	1.84	0.43	2.81	2.27	2.97	7.99	1.40	1.66	3.12	2.77	1.26	0.73	17.14	29.25	30.25
1919	0.47	2.37	0.98	3.54	2.24	5.04	6.34	2.34	1.27	2.11	2.88	0.77	17.23	30.35	33.07
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	WARM	ANN	WAT
1918	0.55	0.47	0.88	1.21	4.94	2.61	3.93	3.57	1.18	2.59	3.98	1.91	16.23	27.82	22.08
1917	2.06	0.72	2.96	1.69	3.47	3.71	4.20	2.88	2.05	2.10	0.07	0.57	16.31	26.48	26.70
1916	2.97	0.45	1.42	2.84	7.12	5.81	1.94	2.83	2.65	1.67	0.39	0.90	20.35	30.99	35.02
1915	1.36	2.17	1.14	1.74	4.64	5.26	5.99	3.61	2.83	2.77	3.76	0.46	22.33	35.73	31.27
1914	0.89	0.53	1.19	3.24	1.99	8.96	1.43	7.38	2.98	1.76	0.21	0.56	22.74	31.12	32.30
1913	0.44	0.73	1.35	2.11	3.03	2.35	7.95	1.74	4.04	2.75	0.91	0.05	19.11	27.45	26.61
1912	0.60	0.26	0.33	2.39	5.53	1.16	6.21	5.57	1.65	1.04	0.02	1.81	20.12	26.57	33.02
1911	0.85	0.91	1.01	2.46	4.08	6.37	4.37	3.53	5.28	6.09	1.30	1.93	23.63	38.18	30.70
1910	1.15	0.64	0.08	0.80	1.43	1.57	0.94	1.85	2.25	0.85	0.55	0.44	8.04	12.55	17.77
1909	1.69	2.27	0.33	2.01	3.58	3.31	4.63	2.17	3.60	1.76	2.82	2.48	17.29	30.65	28.27
1908	0.51	1.06	1.76	3.85	7.70	6.67	2.05	0.91	4.47	2.24	1.17	1.27	21.80	33.66	32.01
1907	1.26	0.87	0.81	1.12	2.44	4.43	3.37	5.18	4.66	1.46	0.95	0.62	20.08	27.17	29.86
1906	1.62	0.35	0.99	2.00	9.58	3.28	2.46	4.33	5.06	2.26	2.45	1.01	24.71	35.39	35.52
1905	0.83	0.65	0.82	0.83	4.31	8.18	3.24	4.39	5.83	2.74	2.95	0.16	25.95	34.93	35.73
1904	0.66	0.94	1.50	1.87	3.45	4.03	4.77	5.66	3.32	5.97	0.10	0.58	21.23	32.85	31.52
1903	0.32	0.70	2.07	3.52	4.72	1.17	6.69	4.84	7.37	4.05	0.40	0.87	24.79	36.72	37.72
1902	0.54	0.51	0.38	2.70	3.72	2.54	7.36	4.47	3.96	1.80	1.81	2.71	22.05	32.50	28.52
1901	0.42	0.31	2.20	1.37	1.36	5.67	2.14	2.24	4.37	0.78	0.92	0.64	15.78	22.42	26.74
1900	0.65	0.87	1.73	1.66	0.31	2.01	7.09	6.48	7.90	5.29	0.77	0.60	23.79	35.36	33.98
1899	0.82	1.24	2.74	0.77	3.56	5.07	1.61	3.54	1.62	3.62	0.44	1.22	15.40	26.25	28.37
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	WARM	ANN	WAT
1898	0.06	1.58	2.24	1.26	5.40	2.83	3.05	2.82	1.06	5.75	1.56	0.09	15.16	27.70	23.10
1897	2.07	1.23	3.70	1.32	1.83	7.58	5.31	2.09	2.40	1.71	0.91	0.18	19.21	30.33	36.00
1896	0.86	0.20	3.37	5.45	3.71	3.38	1.17	4.15	2.62	3.95	3.82	0.70	15.03	33.38	26.01
1895	0.96	0.53	0.48	1.78	2.75	3.06	3.70	2.01	4.35	0.06	0.88	0.16	15.87	20.72	25.29
1894	1.29	0.08	2.87	4.55	4.74	1.34	0.33	0.50	1.81	3.81	0.54	1.32	8.72	23.18	23.38
1893	1.25	1.71	2.09	5.03	2.58	1.50	2.21	4.63	2.63	2.19	1.08	2.60	13.55	29.50	25.26
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1892	0.06	1.55	1.07	1.28	5.85	7.27	10.04	5.08	1.26	0.31	0.62	0.70	29.50	35.09	38.95
1891	0.87	1.67	1.42	2.32	1.32	3.45	2.88	3.19	1.94	1.54	0.86	3.09	12.78	24.55	

Appendix E. Wetland Boundary Maps





## Wetland Boundary Map Sheet Key

CRYSTAL AIRPORT Proposed Airfield Improvements





## **Project Information**

T118N, R21W, S4 and T119N, R21W, S33 Cities of Brooklyn Park, Brooklyn Center, and Crystal Hennepin County, MN Area of Interest = 50.1 acres Field work conducted: June 4 -5 and September 24 - 26, 2018 Image Source: MnGEO WMS Image Service, Hennepin County (2016 color 7-county)



J-76



# Wetland Boundary Map

**CRYSTAL AIRPORT Proposed Airfield Improvements** 

Proposed Airfield Improvements
Legend
Delineated Wetland
SAMPLING POINT TYPE
Upland Data Point
Wetland Data Point
Photo Location *
> Flow Direction
Ditch/Swale Flow
—— Storm Sewer Inlet/Outlet
Culvert
Airport Boundary
Project Area of Interest
MNPublic Waters Basins
<b>ELEVATION CONTOURS**</b>
Index
Intermediate
PUBLIC WATERCOURSES
Public Water Watercourse
Public Ditch/Altered Natural Watercourse
<ul> <li>* See Appendix G for Field Photographs</li> <li>** Contour interval is 2 feet</li> </ul>
h .
· · · · · · · · · · · · · · · · · · ·
0 50 100 200 Feet
Project Information
T118N, R21W, Section 4 and T119N, R21W, Section 33 Cities of Brooklyn Park, Brooklyn Center, and Crystal Hennepin County, MN
Area of Interest = 50.1 acres Field work conducted: MAP 1 of 2
June 4 -5 and September 24 - 26, 2018
WILL FILL WALKS LAND FILLING WALKS LEWED ASID 200

Scott Avenue North

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Mn Public Waters Data: Public Waters (PW) Basin and Watercourse Delineations, Hennepin County, MN Geospatial Commons

Contour Source: Hennepin County GIS Office, Data derived from Minnesota Department of Natural Resources LiDAR, 2012

Image Source: MnGEO WMS Image Service, Hennepin County (2016 color 7-county)





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CRYSTAL AIRPORT Proposed Airfield Improvements

Proposed Airfield Improvements
Legend
Delineated Wetland
SAMPLING POINT TYPE
Upland Data Point
🔶 Wetland Data Point
Photo Location *
> Flow Direction
Ditch/Swale Flow
—— Storm Sewer Inlet/Outlet
Culvert
Airport Boundary
Project Area of Interest
MNPublic Waters Basins
ELEVATION CONTOURS**
Index
Intermediate
PUBLIC WATERCOURSES
Public Water Watercourse
Public Ditch/Altered Natural Watercourse
* See Appendix G for Field Photographs ** Contour interval is 2 feet
Contour Interval is 2 reet
n l
0 50 100 200 Feet
Project Information
T118N, R21W, Section 4 and
T119N, R21W, Section 33 Cities of Brooklyn Park, Brooklyn
Center, and Crystal Hennepin County, MN
Area of Interest = 50.1 acres Field work conducted: MAP 2 of 2
June 4 -5 and September 24 - 26, 2018
Mn Public Waters Data: Public Waters (PW) Basin and Watercourse Delineations, Hennenin County

60

860-

Mn Public Watercourse Delineations, Hennepin County, MN Geospatial Commons

Contour Source: Hennepin County GIS Office, Data derived from Minnesota Department of Natural Resources LiDAR, 2012

Image Source: MnGEO WMS Image Service, Hennepin County (2016 color 7-county)



Appendix F. Data Sheets

Project/Site: Crystal Airport (MIC) Airfield Improvement				
Applicant/Owner: Metropolitan Airports Commission		State	e: <u>Minnesota</u>	Sample Point: <u>DP1</u>
				n, Township, Range: <u>S4, T118N, R21W</u>
Landform (hillslope, terrace, etc.): shallow basin	Local	relief (con	cave, convex,	none): <u>concave</u> Slope (%): <u>&lt;1%</u>
Subregion (LRR or MLRA): K/155 Lat:	45.05585		Long:	-93.348128 Datum: WGS84
Soil Map Unit Name: Seelyeville and Markey soils, depr	essional, 0 to	1 percent	slopes (D30A)	NWI classification: <u>PEM1A</u>
Are climatic hydrologic conditions on the site typical for t	his time of ye	ar? Yes _[	No	(If no, explain in Remarks.)
Are Vegetation 🛛 , Soil 🖄 , or Hydrology 🔲	significantly	disturbed?	Are "Norr	nal Circumstances" present? Yes No
Are Vegetation, Soil, or Hydrology	naturally pro	blematic?	(If neede	d, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map s	howing sa	mpling p	oint locatio	ons, transects, important features, etc.
Hydrophytic Vegetation Present? Yes	No		Is the Sam	pled Area
Hydric Soil Present? Yes 🖂	No		within a W	
Wetland Hydrology Present? Yes 🖂	No		If yes, optio	nal Wetland Side ID: 2
Remarks: (Explain alternative procedures here or in	a separate re	eport.) A W	/ETS analysis o	of the antecedent precipitation indicates the hydrologic
conditions on the site were drier than normal at the	time of inves	stigation. A	Area was mow	ed recently; soil disturbance due to filling and grading.
VEGETATION - Use scientific names of plant	s			
	Absolute	Dominant	Indicator	<b>50/20 Thresholds</b> 20% 50%
Tree Stratum (Plot size:)	% Cover	Species?	Status	Tree Stratum
1.				Sapling/Shrub Stratum
2.				Herb Stratum <u>21</u> <u>52</u> Woody Vine Stratum
3.				Dominance Test worksheet:
4.				
5.				Number of Dominant Species
		= Total Co	ver	That Are OBL, FACW, or FAC: <u>2</u> (A)
Sapling/Shrub Stratum (Plot size:)				Total Number of Dominant
1.				Species Across All Strata: <u>2</u> (B)
2.				Percent of Dominant Species
3.				That Are OBI, FACW, or FAC: <u>100</u> (A/B) Prevalence Index worksheet:
4.				Total % Cover of. Multiply by:
5.				OBL species x 1 =
		= Total Co	ver	FACW species x 2 =
Herb Stratum (Plot size: <u>5 ft.</u> )				FAC species x 3 =
1. Eleocharis obtusa	30	X	OBL	FACU species x 4 =
2. Persicaria hydropiper	<u>70</u> 5	Х	OBL	UPL species x 5 =
3. Alopecurus pratensis 4.	5		FAC	Column Totals: (A) (B)
5.				Prevalence Index = B/A =
6.				Hydrophytic Vegetation Indicators:
7.				Rapid Test for Hydrophytic Vegetation
8.				Dominance Test is >50%
9.				Prevalence Index is $\leq 3.0^1$
10.			1	Morphological Adaptations' (Provide supporting
11.				data in Remarks or on a separate sheet)
12.				Problematic Hydrophytic Vegetation' (Explain)
	105	= Total Co	ver	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Woody Vine Stratum (Plot size:)				Definitions of Vegetation Strata:
1.				<b>Tree</b> – Woody plants 3 in. (7.6 cm) or more in diameter at
2.		<b>.</b>		breast height (DBH), regardless of height.
Remarks: (Include photo numbers here or on a separa		<u>= Total Co</u> ydrophytic		<b>Sapling/shrub</b> – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
present. <i>Persicaria hydropiper</i> identified on basis of rearea mown recently.	-		-	Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.
				Hydrophytic Vegetation Present?
				Yes <u>No</u>

SO	IL
----	----

0-4       10YR 2/2       100       sand         4-10       10YR 3/1       90       5YR 4/6       10       C       M       Sand       With some organic detritus         10-16       10YR 2/1       100       Sand       Sand       Sand       Sand         10-16       10YR 2/1       100       Dark Surface (Sal Carton:       PL=Pore Lining, M=Matrix.         11       Sand Surface (S7) (LRR K, MLRA 149B)       Coast Prairie Redox (A16) (LRR K, L, MLRA 149B)       Coast Prairie Redox (A16) (LRR K, L)       Delytade Below Surface (S9) (LRR K, L)       Delytade Below Surface (S9) (LRR K, L)       Delytade Below Surface (S9) (LRR K, L)       Delytade Surface (S9) (LRR K, L)	Depth	Matrix			Redox Fe	atures			
4-10       10/R 3/1       90       5YR 4/6       10       C       M       Sand       With some organic detritus         10-16       10/R 2/1       100       Image: Comparison of the second of the	(inches)	Color (moist)	%	Color (mois	st) %	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
10-16       10YR 2/1       100       Sand         Type:       C-Concentration, D-Depletion, RM-Reduced Matrix, CS       Location:       PL-Pore Lining, M-Matrix.         Type:       C-Concentration, D-Depletion, RM-Reduced Matrix, CS       Indicators for Problematic Hydric         Histosol (A1)       Stripped Matrix (S6)       2 cm Muck: (A10) (LRR K, L MLRA 149B)       Coses Praire Redox (A16) (LRR K, L, MLRA 149B)         Bitack Histic Exploredon (A2)       Dark Surface (S7) (LRR R, MLRA 149B)       Coses Praire Redox (A16) (LRR K, L)         Bitack Histic (X3)       Deplynalue Below Surface (S8) (LRR K, L)       Dark Surface (S9) (LRR K, L)         Depleted Below Dark Surface (A11)       Learny Gleyed Matrix (F2)       Dark Surface (S9) (LRR K, L)         Stratified Layers (A5)       Depleted Matrix (F2)       Drohvers Redox (A12) (LRR K, L)         Sandy Mucky Mineral (S1)       Redox Dark Surface (F7)       Mass Spocie (TA6) (MLRA 1444, 145, 145         Sandy Micky Matrix (S4)       Depleted Dark Surface (F7)       Mass Spocie (TA6) (MLRA 1444, 145, 145         Sandy Medox (S5)       Redox Depressions (F8)       Red Paret Muckarea (F21)         Tradicators of Problematic Hydrology must be pressent, unless disturbed or rippeting in Remarks)       Restrictice Layer (f observed):         Type:	0-4	10YR 2/2	100					sand	
Type:       Cacation:       PL=Pore Lining, M=Matrix.         Type:       Cacation:       PL=Pore Lining, M=Matrix.         Tright:       Plant:       Plant:         Tright:       Provide Matrix (S6)       Pore Matrix (S1)         Tright:       Cacation:       Plant:         Sandy:       Cacation:       Plant:       Plant:         Sandy:       Cacation:       Plant:       Plant:         Tright:       Cacation:       Plant:       Plant:	4-10	10YR 3/1	90	5YR 4/6	10	С	М	Sand	With some organic detritus
Hydric Soil Indicators:       Indicators for Problematic Hydric         I Histic Epipedon (A2)       Dark Surface (S7) (LRR R, MLRA 149B)       Indicators for Problematic Hydric         I Histic Epipedon (A2)       Dark Surface (S7) (LRR R, MLRA 149B)       Coast Praine Redox (A16) (LRR K, L)         I Hydrogen Sulfide (A4)       I'min Dark Surface (S9) (LRR R, MLRA 149B)       Dark Surface (S7) (LRR K, L)         I Hydrogen Sulfide (A4)       I'min Dark Surface (S9) (LRR R, MLRA 149B)       Dork Surface (S7) (LRR K, L)         I Torch Meday Mineral (F1)       Loamy Mucky Mineral (F1) (LRR K, L)       Polyvalue Below Surface (S8) (LRR K, L)         I Torch Magnese Masses (F12)       I'min Dark Surface (S9) (LRR K, L)       Polyvalue Edeox Surface (S9) (LRR K, L)         I Sandy Mucky Mineral (S1)       Depleted Matrix (F3)       I'mon Problematic Socie (F19) (I'RR A 144A, 145, 145         I Sandy Redox (S5)       Depleted Natrix (F3)       Polyvalue Edeox Surface (F7)       Mesic Spocie (TF12) (I'RR K, L)         I Problematic.       I'mon Problematic Surface (S1)       Red Parent Material (F21)       Very Shallow Dark Surface (TF12)         I Problematic.       I'mon Problematic Surface (S1)       I'mon Problematic Surface (S1)       I'mon Problematic Surface (TF12)         Problematic.       I'mon Problematic Surface (S2)       I'mon Problematic Surface (S1)       I'mon Problematic Surface (TF12)         Problematic.       I'	10-16	10YR 2/1	100					Sand	
Hydric Soil Indicators:       Indicators for Problematic Hydric         I Histic Epipedon (A2)       Dark Surface (S7) (LRR R, MLRA 149B)       Indicators for Problematic Hydric         I Histic Epipedon (A2)       Dark Surface (S7) (LRR R, MLRA 149B)       Coast Praine Redox (A16) (LRR K, L)         I Hydrogen Sulfide (A4)       I'min Dark Surface (S9) (LRR R, MLRA 149B)       Dark Surface (S7) (LRR K, L)         I Hydrogen Sulfide (A4)       I'min Dark Surface (S9) (LRR R, MLRA 149B)       Dork Surface (S7) (LRR K, L)         I Torch Meday Mineral (F1)       Loamy Mucky Mineral (F1) (LRR K, L)       Polyvalue Below Surface (S8) (LRR K, L)         I Torch Magnese Masses (F12)       I'min Dark Surface (S9) (LRR K, L)       Polyvalue Edeox Surface (S9) (LRR K, L)         I Sandy Mucky Mineral (S1)       Depleted Matrix (F3)       I'mon Problematic Socie (F19) (I'RR A 144A, 145, 145         I Sandy Redox (S5)       Depleted Natrix (F3)       Polyvalue Edeox Surface (F7)       Mesic Spocie (TF12) (I'RR K, L)         I Problematic.       I'mon Problematic Surface (S1)       Red Parent Material (F21)       Very Shallow Dark Surface (TF12)         I Problematic.       I'mon Problematic Surface (S1)       I'mon Problematic Surface (S1)       I'mon Problematic Surface (TF12)         Problematic.       I'mon Problematic Surface (S2)       I'mon Problematic Surface (S1)       I'mon Problematic Surface (TF12)         Problematic.       I'									
Hydric Soil Indicators:       Indicators for Problematic Hydric         I Histic Epipedon (A2)       Dark Surface (S7) (LRR R, MLRA 149B)       Indicators for Problematic Hydric         I Histic Epipedon (A2)       Dark Surface (S7) (LRR R, MLRA 149B)       Coast Praine Redox (A16) (LRR K, L)         I Hydrogen Sulfide (A4)       I'min Dark Surface (S9) (LRR R, MLRA 149B)       Dark Surface (S7) (LRR K, L)         I Hydrogen Sulfide (A4)       I'min Dark Surface (S9) (LRR R, MLRA 149B)       Dork Surface (S7) (LRR K, L)         I Torch Meday Mineral (F1)       Loamy Mucky Mineral (F1) (LRR K, L)       Polyvalue Below Surface (S8) (LRR K, L)         I Torch Magnese Masses (F12)       I'min Dark Surface (S9) (LRR K, L)       Polyvalue Edeox Surface (S9) (LRR K, L)         I Sandy Mucky Mineral (S1)       Depleted Matrix (F3)       I'mon Problematic Socie (F19) (I'RR A 144A, 145, 145         I Sandy Redox (S5)       Depleted Natrix (F3)       Polyvalue Edeox Surface (F7)       Mesic Spocie (TF12) (I'RR K, L)         I Problematic.       I'mon Problematic Surface (S1)       Red Parent Material (F21)       Very Shallow Dark Surface (TF12)         I Problematic.       I'mon Problematic Surface (S1)       I'mon Problematic Surface (S1)       I'mon Problematic Surface (TF12)         Problematic.       I'mon Problematic Surface (S2)       I'mon Problematic Surface (S1)       I'mon Problematic Surface (TF12)         Problematic.       I'							İ		
Hydric Soil Indicators:       Indicators for Problematic Hydric         I Histic Epipedon (A2)       Dark Surface (S7) (LRR R, MLRA 149B)       Indicators for Problematic Hydric         I Histic Epipedon (A2)       Dark Surface (S7) (LRR R, MLRA 149B)       Coast Praine Redox (A15) (LRR K, L)         I Hydrogen Sulfide (A4)       I'thin Dark Surface (S9) (LRR R, MLRA 149B)       Dark Surface (S7) (LRR K, L)         I Hydrogen Sulfide (A4)       I'thin Dark Surface (S9) (LRR R, MLRA 149B)       Dork Surface (S7) (LRR K, L)         I Tothfeed Layers (A5)       Loamy Mucky Mineral (F1) (LRR K, L)       Polyvalue Below Surface (S8) (LRR K, L)         I Tothfeed Layers (A5)       Loamy Mucky Mineral (F2)       Polyvalue Below Surface (S8) (LRR K, L)         I Tothfeed Layers (A5)       Deapleted Matrix (F2)       Polyvalue Below Surface (S9) (LRR K, L)         I Tothfeed Maxix (S4)       Deepleted Matrix (F3)       Polyvalue Below Surface (S8) (MLRA 144, 145, 145         I Sandy Mucky Mineral (S1)       Redox Depressions (F8)       Red Parent Material (F21)         I ruicitators of Hydrophytic vegtation and wetiand hydrology must be present, unless disturbed or problematic.       Port Sufface S01 Present? Yes No I         Retar Material (F21)       Mydric Soils Indicators Sandy Redox (S5) is satisfied.       YDROLOGY         Wetand Hydrology Indicators:       Mydric Soils Indicator Sandy Redox (S1)       Saturation Nisible on Aerial Imagery (C2) <tr< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr<>									
Hydric Soll Indicators:       Indicators for Problematic Hydric         Histic Explaced n(A2)       Dark Surface (S7) (LRR R, MLRA 149B)       Coast Prairie Redox (A16) (LRR K, L, MLRA 149B)         Histic Explaced n(A2)       Dark Surface (S7) (LRR R, MLRA 149B)       Coast Prairie Redox (A16) (LRR K, L)         Hydrogen Sulfide (A4)       Thin Dark Surface (S9) (LRR R, MLRA 149B)       Dark Surface (S7) (LRR K, L)         Depleted Below Dark Surface (A11)       Loamy Mucky Mineral (F1) (LRR K, L)       Polyvalue Below Surface (S8) (LRR K, L)         Thin Dark Surface (A12)       Depleted Matrix (F2)       Thin Dark Surface (S9) (LRR K, L)         Sandy Mucky Mineral (S1)       Depleted Matrix (F3)       Polyvalue Below Surface (S8) (MLRA 144, 145, 145         Sandy Mucky Mineral (S1)       Depleted Dark Surface (F7)       Mexic Spoci (T6) (MLRA 144, 145, 145         Indicators of hydrophytic vegatation and wetfand hydrology must be present, unless disturbed or problematic:       Very Shallow Dark Surface (TF12)         robeinatic       Lange Present.       Hydric Soil Present? Yes No       No         Depleted Ndrology Indicators:       Hydric Soil Present? Yes No       No       Secondary Indicators (minimum of two require present. Hydric soils indicator Sandy Redox (S5) is satisfied.         YDROLOGY       Wetand Hydrology Indicators:       Hydrice Soil Present? Yes No       No       Distretexplant in Remarks)         Staturation (A3)	Type: C=	Concentration, D=	Depletion	, RM=Reduce	d Matrix, CS:	=Covered o	r Coated Sa	and Grains.	<sup>2</sup> Location: PL=Pore Lining, M=Matrix.
I Histic Epipedon (A2)        Dark Surface (S7) (LRR R, MLRA 149B)        Coast Prairie Redox (A16) (LRR K, L, J)             Bdack Histic (A3)       Delyvalue Below Surface (S9) (LRR R, MLRA 149B)       S control Pract Mudy Pedt (S3) (LRR K, L)            Bdack Histic (A3)       Delyvalue Below Surface (S9) (LRR R, MLRA 149B)       Doark Surface (S2) (LRR K, L)            Bstratified Layers (A5)       Loamy Mucky Mineral (F1) (LRR K, L)       Polyvalue Below Surface (S9) (LRR K, L)            Depleted Below Dark Surface (A11)       Loamy Gleyed Matrix (F2)       Thin Dark Surface (S9) (LRR K, L)            Sandy Gleyed Matrix (S4)       Depleted Dark Surface (F7)       Mesic Spodc (TA6) (MLRA 144A, 145, 145            Sandy Redox (S5)          Redox Depressions (F6)       Pedmont Rocopain Sols (F9) (MLRA 144A, 145, 145            Traid-stors of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or robernatic.       Very Shallow Dark Surface (TF12)            Depth (inches):				,	,				
□       Black Histic (A3)       □       Polyvalue Below Surface (S3) (LRR K, MLRA 149 B)       □       S cm Peat or Mucky Peat (S3) (LRR K, L)         □       Stratified Layers (A5)       □       Loamy Mucky Mineral (F1) (LRR K, L)       □       Polyvalue Below Surface (S3) (LRR K, L)         □       Depleted Below Dark Surface (A11)       □       Loamy Mucky Mineral (F1) (LRR K, L)       □       Thin Dark Surface (S3) (LRR K, L)         □       Sandy Mucky Mineral (S1)       □       Depleted Matrix (F3)       □       Iron-Manganese Masses (F12) (LRR K, L)         □       Sandy Gledyed Matrix (S4)       □       Depleted Dark Surface (F6)       □       Predmont Poodplain Solis (F19) (MLRA 144, 145, 145         □       Sandy Redox (S5)       □       Redox Depressions (F8)       □       Red Parent Material (F21)         1'Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.       □       Other (Explain in Remarks)         Restrictive Layer (if observed):	Histo	osol (A1)			Stripped Mat	rix (S6)			2 cm Muck - (A10) (LRR K, L, MLRA 149
Hydrogen Sulfide (A4)           Thin Dark Surface (S9) (LRR K, L)           Dark Surface (S7) (LRR K, L)             Depleted Below Dark Surface (A11)           Loamy Mucky Mineral (F1) (LRR K, L)          Depleted Matrix (F2)             Thick Dark Surface (A12)        Depleted Matrix (F3)          Loamy Gieyed Matrix (F3)          Lorot-Manganese Masses (F12) (LRR K, L)            Sandy Kedox (S5)          Redox Depresents or F6)          Leed Parent Material (F12)            Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or          Leed Parent Material (F12)            Sandy Kedox (S5)          Redox Depresents or F6)          Hydric Soli Present? Yes No □            Dept (inches):          Cert (if observed):              Type:              Hydric Soli are present. Hydric solis indicator Sandy Redox (S5) is satisfied.             VBROLOGY           Mater Stained Leaves (69)           Drainage Patterns (B10)             Saturation (A3)          Mater Stained Leaves (69)           Drainage Patterns (B10)             Saturation Vasible on Aerial Imagery(C3)           Drainage Patterns (B10)           Drainage Patterns (B10)	🔲 Histi	c Epipedon (A2)			Dark Surface	e (S7) <b>(LRF</b>	R, MLRA	149B)	🔲 Coast Prairie Redox (A16) (LRR K, L, R
Stratified Layers (A5)       Loamy Mucky Mineral (F1) (LRR K, L)       Polyvalue Below Surface (S8) (LRR K, L)         □ Depleted Below Dark Surface (A11)       Loamy Gleyed Matrix (F2)       Trinch Dark Surface (S9) (LRR K, L)         □ Sandy Mucky Mineral (S1)       Depleted Matrix (F3)       Tron-Manganese Masses (F12) (LRR K, L)         □ Sandy Mucky Mineral (S1)       Depleted Dark Surface (F7)       Mesic Spoid: (T46) (MRA 144A, 145, 145         [Micators of Mytophytic vegetation and wetland hydrology must be present, unless disturbed or roblematic.       Presented Text (T12)         Protective Layer (If Observed):       Presenter (T60)       Hydric Soil Present?       Yes [S] No [         Depth (Inches):	Blacl	k Histic (A3)			Polyvalue Bel	ow Surface	(S8) <b>(LRR</b>	R, MLRA 149 I	B) 5 cm Peat or Mucky Peat (S3) (LRR K, L, F
□ Depleted Below Dark Surface (A11)       □ Loamy Gleyed Matrix (F2)       □ Thin Dark Surface (S9) (LRR K, L)         □ Thick Dark Surface (A12)       □ Depleted Matrix (F3)       □ Tron-Manganese Masses (F12) (LRR K, L)         □ Sandy Mucky Mineral (S1)       □ Redox Dark Surface (F6)       □ Pedmont Roodplain Solis (F19) (MLRA 144, 145, 145, 146         □ Sandy Gleyed Matrix (S4)       □ Depleted Dark Surface (F7)       □ Mesk Spodc (TA6) (MLR 1444, 145, 145, 146         □ Sandy Gleyed Matrix (S4)       □ Depleted Matrix (F3)       □ Other (Explain In Remarks)         Restrictive Layer (if observed):       □ Other (Explain In Remarks)         Type:	Hydr	rogen Sulfide (A4)	)		Thin Dark Su	urface (S9)	(LRR R, M	ILRA 149B)	Dark Surface (S7) (LRR K, L)
□ Depleted Below Dark Surface (A11)       □ Loamy Gleyed Matrix (F2)       □ Thin Dark Surface (S9) (LRR K, L)         □ Thick Dark Surface (A12)       □ Depleted Matrix (F3)       □ Tron-Manganese Masses (F12) (LRR K, L)         □ Sandy Mucky Mineral (S1)       □ Redox Dark Surface (F6)       □ Pedmont Roodplain Solis (F19) (MLRA 144, 145, 145, 146         □ Sandy Gleyed Matrix (S4)       □ Depleted Dark Surface (F7)       □ Mesk Spodc (TA6) (MLR 1444, 145, 145, 146         □ Sandy Gleyed Matrix (S4)       □ Depleted Matrix (F3)       □ Other (Explain In Remarks)         Restrictive Layer (if observed):       □ Other (Explain In Remarks)         Type:							-	_	Polyvalue Below Surface (S8) (LRR K, I
Thick Dark Surface (A12)        Depleted Matrix (F3)       Iron-Manganese Masses (F12) (LRR K, L,            Gandy Mucky Mineral (S1)        Redox Dark Surface (F6)       Pledmont Roodplain Solis (F19) (MLRA 14            Gandy Macky (S5)        Redox Depressions (F8)       Red Parent Material (F21)            Indicators of hydrophytic vegetation and wettand hydrology must be present, unless disturbed or       Wets Solid (F21)            Indicators of hydrophytic vegetation and wettand hydrology must be present, unless disturbed or       Wetry Shallow Dark Surface (TF12)            Preimary Indicators (information and wettand hydrology must be present, unless disturbed or       Wetry Shallow Dark Surface (TF12)            Preimary Indicators (information and wettand hydrology must be present, unless disturbed or       Wetry Shallow Dark Surface (TF12)            Premary Indicators (information and wettand hydrology must be present, unless disturbed or       Wetry Shallow Dark Surface (TF12)            Premary Indicators (information and wettand hydrology must be present, unless disturbed or       Wetry Shallow Dark Surface (TF12)            Premary Indicators (information of one is required; check all that apphy              Scondary Indicators (infinimum of one is required; check all that apphy          Secondary Indicators (B6)            Surface Water (A1)          Water-Stained Leaves (B9)	_		Surface (A						Thin Dark Surface (S9) (LRR K, L)
Sandy Mucky Mineral (S1)           Redox Dark Surface (F6)           Pledmont Floodplain Solis (F19) (MLRA 144, 145, 145, 145, 145, 145, 145, 145,	Thicl	k Dark Surface (A	.12)	· _					Iron-Manganese Masses (F12) (LRR K, L,
							5)		Piedmont Floodplain Soils (F19) (MLRA 149
Mathematic       Redox Depressions (F8)       Red Parent Material (F21)         Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or roblematic.       Very Shallow Dark Surface (TF12)         Restrictive Layer (if observed):       Uvery Shallow Dark Surface (TF12)       Other (Explain in Remarks)         Peetin (inches):					Depleted Da	rk Surface	(F7)		
Indicators of hydrophytic vegetation and wettand hydrology must be present, unless disturbed or problematic.			<b>`</b>						
wroblematic.			petation an					irbed or	
Restrictive Layer (if observed):       Type:			journer an			50 p. 600,			
Type:	Restricti	ve Laver (if obs	erved):						
Depth (inches):			,						Hydric Soil Present? Yes 🖂 No 🗌
Remarks: Hydric soils are present. Hydric soils indicator Sandy Redox (S5) is satisfied.         YDROLOGY         Wetland Hydrology Indicators:         Primary Indicators (minimum of one is required; check all that apply)       Secondary Indicators (minimum of two required)									,
YDROLOGY         Wetland Hydrology Indicators:         Primary Indicators (minimum of one is required; check all that apply)       Secondary Indicators (minimum of two required)		-			Kantan Canal	. D	-) :+:-6:-		
Wetland Hydrology Indicators:         Primary Indicators (minimum of one is required; check all that apply)       Secondary Indicators (minimum of two required;         Surface Water (A1)       Water-Stained Leaves (B9)       Surface Soil Cracks (B6)         High Water Table (A2)       Aquatic Fauna (B13)       Drainage Patterns (B10)         Saturation (A3)       Marl Deposits (B15)       Moss Trim Lines (B16)         Water Marks (B1)       Hydrogen Sulfide Odor (C1)       Dry-Season Water Table (C2)         Sediment Deposits (B2)       Oxidized Rhizospheres on Living Roots (C3)       Crayfish Burrows (C8)         Drift Deposits (B3)       Presence of Reduced Iron (C4)       Saturation Visible on Aerial Imagery (C9)         Algal Mat or Crust (B4)       Recent Iron Reduction in Tilled Soils (C6)       Stunted or Stressed Plants (D1)         Innundation Visible on Aerial Imagery(B7)       Other (Explain in Remarks)       Sallow Aquitard (D3)         Sparsely Vegetated Concave Surface (B8)       Sirface Water Present?       Yes       No         Surface Water Present?       Yes       No       Depth (inches):       Indicators of         Wetland Hydrology Present?       Yes       No       Depth (inches):       Yes_No       No         Indicators of       Wetland Hydrology Present?       Yes       No       Yes_No       No <td< td=""><td></td><td></td><td>present. H</td><td>yaric solis inc</td><td>licator Sandy</td><td>/ Redox (St</td><td>b) is sausite</td><td>ea.</td><td></td></td<>			present. H	yaric solis inc	licator Sandy	/ Redox (St	b) is sausite	ea.	
Primary Indicators (minimum of one is required; check all that apply)       Secondary Indicators (minimum of two required)         Surface Water (A1)			cators:						
				s required; ch	eck all that a	apply)			Secondary Indicators (minimum of two required
							aves (B9)		
			2)						
	-		-)		-	•			
							•		_
□       Drift Deposits (B3)       □       Presence of Reduced Iron (C4)       □       Saturation Visible on Aerial Imagery (C9)         □       Algal Mat or Crust (B4)       □       Recent Iron Reduction in Tilled Soils (C6)       □       Stunted or Stressed Plants (D1)         □       Iron Deposits (B5)       □       Thin Muck Surface (C7)       □       □       Geomorphic Position (D2)         □       Inundation Visible on Aerial Imagery(B7)       □       Other (Explain in Remarks)       □       Shallow Aquitard (D3)         □       Sparsely Vegetated Concave Surface (B8)       □       FAC-Neutral Test (D5)       □       Microtopographic Relief (D4)         Field Observations:         Surface Water Present?       Yes □       No ⊠       Depth (inches):       Indicators of         Wetard Table Present?       Yes □       No ⊠       Depth (inches):       Yes       No         Describe Recorded Data (stream gauge, monitoring, well, aerial photos, previous inspections), if available:       Previously delineated NWI; saturation present on 2018, 2017, and 2016 aerial images (Google Earth)       Remarks: Wetland hydrology is indicated.			2					ing Doots (C2)	
			2)			•		5	/ / / /
□       Iron Deposits (B5)       □       Thin Muck Surface (C7)       ☑       Geomorphic Position (D2)         □       Inundation Visible on Aerial Imagery(B7)       □       Other (Explain in Remarks)       □       Shallow Aquitard (D3)         □       Sparsely Vegetated Concave Surface (B8)       □       FAC-Neutral Test (D5)       □       Microtopographic Relief (D4)         Field Observations:	_		A)		_				_
☐ Inundation Visible on Aerial Imagery(B7)       ☐ Other (Explain in Remarks)       ☐ Shallow Aquitard (D3)         ☐ Sparsely Vegetated Concave Surface (B8)       ☐ FAC-Neutral Test (D5)         ☐ Microtopographic Relief (D4)         Field Observations:			4)					ed Soils (C6)	( )
		,		/==`	_		. ,		
Field Observations:				5 / /	Other	(Explain in	Remarks)		
Field Observations:       Surface Water Present?       Yes       No ⊠       Depth (inches):       Indicators of         Water Table Present?       Yes       No ⊠       Depth (inches):       Wetland Hydrology Present?         Saturation Present?       Yes       No ⊠       Depth (inches):       Yes       No         Gincludes capillary fringe)       No ⊠       Depth (inches):       Yes       No         Describe Recorded Data (stream gauge, monitoring, well, aerial photos, previous inspections), if available:       Previously delineated NWI; saturation present on 2018, 2017, and 2016 aerial images (Google Earth)       Remarks: Wetland hydrology is indicated.	Spa	arsely Vegetated C	Concave Su	Irface (B8)					
Surface Water Present?       Yes       No       Depth (inches):       Indicators of         Water Table Present?       Yes       No       Depth (inches):       Wetland Hydrology Present?         Saturation Present?       Yes       No       Depth (inches):       Yes       No         Saturation Present?       Yes       No       Depth (inches):       Yes       No         (includes capillary fringe)       Depth (inches):       Operation present       Yes       No         Describe Recorded Data (stream gauge, monitoring, well, aerial photos, previous inspections), if available:       Previously delineated NWI; saturation present on 2018, 2017, and 2016 aerial images (Google Earth)       Image: Google Earth         Remarks: Wetland hydrology is indicated.       Image: Google Earth       Image: Google Earth       Image: Google Earth									Microtopographic Relief (D4)
Surface water Present? Yes   Water Table Present? Yes   No Depth (inches):   Saturation Present? Yes   No Depth (inches):   (includes capillary fringe)   Describe Recorded Data (stream gauge, monitoring, well, aerial photos, previous inspections), if available:   Previously delineated NWI; saturation present on 2018, 2017, and 2016 aerial images (Google Earth)				_	_				Indicators of
Saturation Present?       Yes       No       Depth (inclue):									
(includes capillary fringe)         Describe Recorded Data (stream gauge, monitoring, well, aerial photos, previous inspections), if available:         Previously delineated NWI; saturation present on 2018, 2017, and 2016 aerial images (Google Earth)         Remarks: Wetland hydrology is indicated.									
Describe Recorded Data (stream gauge, monitoring, well, aerial photos, previous inspections), if available: Previously delineated NWI; saturation present on 2018, 2017, and 2016 aerial images (Google Earth) Remarks: Wetland hydrology is indicated.			Yes	s∐ No	⊠ De	epth (inches	5):		
Previously delineated NWI; saturation present on 2018, 2017, and 2016 aerial images (Google Earth) Remarks: Wetland hydrology is indicated.			ream gaug	ge, monitoring	g, well, aeria	l photos, pr	evious inspe	ections), if avai	ilable:
	Remarks:	: Wetland hydrolo	gy is indic	ated.					
Photo: See Photo 3		,	_,						
	Dhata: C	oo Dhoto 2							



Photo 3. Wetland 1. Data point 1, view to the northeast.

				epin Sampling Date: June 4, 2018
				Sample Point: <u>DP2</u>
				n, Township, Range: <u>S4, T118N, R21W</u>
				none): <u>none</u> Slope (%): <u>&lt;1%</u>
				-93.348304 Datum: WGS84
Soil Map Unit Name: Seelyeville and Marke	y soils, depressional, 0 to 1	l percent s	lopes (D30A)	NWI classification:
Are climatic hydrologic conditions on the site	e typical for this time of yea	r?Yes	] No	(If no, explain in Remarks.)
Are Vegetation 🛛 🦳 , Soil 🔄 , or Hydi	rology 🔲 significantly di	isturbed?	Are "Norm	nal Circumstances" present? Yes 🗌 No 🔀
Are Vegetation, Soil, or Hydi	rology 🔲 naturally prob	lematic?	(If needeo	d, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach	site map showing san	npling po	oint locatio	ons, transects, important features, etc.
Hydrophytic Vegetation Present?	Yes 🗌 No 🛙		Is the Sam	<u> </u>
Hydric Soil Present?	Yes 🗌 No 🛙		within a W	
Wetland Hydrology Present?	Yes 🗌 No 🛛		If yes, option	nal Wetland Side ID:
			TS analysis o	of the antecedent precipitation indicates the hydrologic
				cently; soil disturbance due to filling/grading.
VEGETATION - Use scientific name	es of plants			
	Absolute I	Dominant	Indicator	<b>50/20 Thresholds</b> 20% 50%
Tree Stratum (Plot size:)	% Cover	Species?	Status	Tree Stratum
1.				Sapling/Shrub Stratum
2.				Herb Stratum         21         53
3.				Woody Vine Stratum
4.				Dominance Test worksheet:
5.				Number of Dominant Species
5.		Total Cov	or	That Are OBL, FACW, or FAC: <u>0</u> (A)
Carling (Church Churchurg (Dist size)	=======================================		rei	Total Number of Dominant
Sapling/Shrub Stratum (Plot size:)				Species Across All Strata: <u>2</u> (B)
1.				Percent of Dominant Species
2.				That Are OBI, FACW, or FAC: <u>0</u> (A/B)
3.				Prevalence Index worksheet:
4.				Total % Cover of. Multiply by:
5.				OBL species x 1 =
	=	Total Cov	/er	FACW species x 2 =
Herb Stratum (Plot size: <u>5 ft.</u> )		.,	54.011	FAC species x 3 =
1. Poa pratensis	50	X	FACU	FACU species x 4 =
2. Schedonorus arundinaceus	50	Х	FACU	UPL species x 5 =
3. Trifolium repens	5		FACU	Column Totals: (A) (B)
4.				Prevalence Index = $B/A = $
5.				Hydrophytic Vegetation Indicators:
6.				Rapid Test for Hydrophytic Vegetation
7.				Dominance Test is >50%
8.				Prevalence Index is $\leq 3.0^1$
9.				Morphological Adaptations' (Provide supporting
10.				data in Remarks or on a separate sheet)
11.				Problematic Hydrophytic Vegetation' (Explain)
12.	105 =	Total Cov	ver	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be
Woody Vine Stratum (Plot size:)			-	present, unless disturbed or problematic.  Definitions of Vegetation Strata:
1.				<b>Tree</b> – Woody plants 3 in. (7.6 cm) or more in diameter at
2.				breast height (DBH), regardless of height.
Domaylou (Induda abata sumbrus bu		Total Cov		<b>Sapling/shrub</b> – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
Remarks: (Include photo numbers here or	. , ,	• •	5	
not present. Data point 2 is slightly highe transect.	i ulari wetiana sampling p	UITUS (DP1	anu DP3) on	and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.
				Hydrophytic Vegetation Present?

Depth	ription: (Describe Matrix	·		Redox Fea	atures			,
(inches)	Color (moist)	%	Color (mois	t) %	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-4	10YR 2/2	100					sand	
4-14	10YR 3/1	90					sand	Very mixed; pebbles
	10YR 2/1	8	5YR 4/6	2	С	М	sand	- / - /
14-16+	10YR 2/1	100	511(1)0		<u> </u>			
14-10+	10TR 2/1	100					sand	
								-
	Concentration, D=	Depletion,	, RM=Reduced	Matrix, CS=	=Covered o	r Coated San	d Grains.	<sup>2</sup> Location: PL=Pore Lining, M=Matrix.
-	oil Indicators:				. (22)			Indicators for Problematic Hydric
Histo				stripped Mat				2 cm Muck - (A10) (LRR K, L, MLRA 1498
<u> </u>	c Epipedon (A2)			Dark Surface	(S7) <b>(LRR</b>	R, MLRA 1	L49B)	Coast Prairie Redox (A16) (LRR K, L, R)
Black	(Histic (A3)		<u> </u>	olyvalue Bel	ow Surface	(S8) <b>(LRR R</b>	, MLRA 149 E	<b>B)</b> <u>5</u> cm Peat or Mucky Peat (S3) (LRR K, L, R
🔲 Hydr	ogen Sulfide (A4)	)	ד 🛄	hin Dark Su	Irface (S9)	(LRR R, ML	.RA 149B)	Dark Surface (S7) (LRR K, L)
<b></b> Strat	ified Layers (A5)		<u> </u>	oamy Muck	y Mineral (I	-1) (LRR K,	L)	Polyvalue Below Surface (S8) (LRR K, L)
Deple	eted Below Dark	Surface (A	\11) <u>□</u> L	oamy Gleye	d Matrix (F	2)		Thin Dark Surface (S9) (LRR K, L)
☐ Thick	k Dark Surface (A	12)		Depleted Ma	trix (F3)			Iron-Manganese Masses (F12) (LRR K, L, R
	ly Mucky Mineral			Redox Dark S		)		Piedmont Floodplain Soils (F19) (MLRA 1491
	ly Gleyed Matrix (	. ,		Depleted Dar	•			Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
	ly Redox (S5)	31)		Redox Depre				Red Parent Material (F21)
	of hydrophytic veg	jetation an	d wetland hydi	rology must i	be present,	unless disturi	oed or	Very Shallow Dark Surface (TF12)
problematic								Other (Explain in Remarks)
	ve Layer (if obs	-						
Type: Due	g to refusal; hard	, compact	<u>ed layer</u>					Hydric Soil Present? Yes 🔲 No 🛛
Depth (ind	ches): <u>16″</u>							
Remarks:	Hydric soils are r	not presen	it. Does not m	eet hydric s	oils indicate	ors.		
IYDROL	OGY							
Wetland	Hydrology Indi	cators:						
Primary Ir	ndicators (minimu	m of one i	s required; ch	eck all that a	ipply)			Secondary Indicators (minimum of two required)
Surf	face Water (A1)		-	U Water-	Stained Lea	aves (B9)		Surface Soil Cracks (B6)
Higł	h Water Table (A2	2)		Aquati	c Fauna (B1	3)		Drainage Patterns (B10)
Satu	uration (A3)			Marl D	eposits (B1	5)		Moss Trim Lines (B16)
_	er Marks (B1)				gen Sulfide			Dry-Season Water Table (C2)
	iment Deposits (B	2)	-		-	. ,	ig Roots (C3)	Crayfish Burrows (C8)
	t Deposits (B3)	2)	-		•	ced Iron (C4)	• • • •	Saturation Visible on Aerial Imagery (C9)
		4)	-	_		• •		
	al Mat or Crust (B4	+)	-			ction in Tilled		Stunted or Stressed Plants (D1)
_	1 Deposits (B5)		-		luck Surface			Geomorphic Position (D2)
Inur	ndation Visible on	Aerial Ima	agery(B7)	Other	(Explain in I	Remarks)		Shallow Aquitard (D3)
Spa	rsely Vegetated C	oncave Su	rface (B8)					FAC-Neutral Test (D5)
								Microtopographic Relief (D4)
Field Obs	servations:							
Surface W	/ater Present?	Yes	s 🗌 🛛 No 🛛		pth (inches	s):		Indicators of
Water Tab	ole Present?	Yes	s 🗌 🛛 No 🛛		pth (inches	s):		Wetland Hydrology Present?
Saturation		Yes	s 🗌 🛛 No 🛛	🛛 De	pth (inches	s):		Yes No_ <u>×</u>
(includes (	<u>capillary fringe)</u> Recorded Data (st	room gour	no monitorino	wall sorial	nhotos nr	avious incos	tions) if avail	lable.
Describe [	Necolucu Dala (Sl	i cani yaug	je, monitoring	, weil, aeildi	prioros, pre	evious illisped	.uuiis), ii avdi	
		otland are	2					
Previously	/ mapped NWI w			r indiantad				
Previously				r indicated.				



Data Points 1 and 2, view to the east.

Project/Site: Crystal Airport (MIC) Airfield	Improvements	City/	County: <u>Henn</u>	epin Sampling Date: June 4, 2018
				Sample Point: DP3
Investigator(s): Brauna Hartzell and Kim	Shannon, Mead & Hunt, Inc		Section	n, Township, Range: <u>S4, T118N, R21W</u>
				none): <u>concave</u> Slope (%): <u>&lt;1%</u>
Subregion (LRR or MLRA): K/155				-93.348522 Datum: WGS84
				NWI classification: <u>PEM1A</u>
Are climatic hydrologic conditions on the si	te typical for this time of year	ar?Yes [	] No 🛛	(If no, explain in Remarks.)
Are Vegetation, Soil, or Hy	drology 🔲 significantly o	listurbed?	Are "Norn	nal Circumstances" present? Yes No
Are Vegetation, Soil, or Hy	drology 🔲 naturally prol	plematic?	(If neede	d, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach	site map showing sa	mpling p	oint locatio	ns, transects, important features, etc.
Hydrophytic Vegetation Present?	Yes 🛛 No		Is the Sam	pled Area
Hydric Soil Present?	Yes 🛛 No		within a W	
Wetland Hydrology Present?	Yes 🛛 No		If yes, optio	nal Wetland Side ID: 1
Remarks: (Explain alternative procedu conditions on the site were drier than				of the antecedent precipitation indicates the hydrologic mowed recently.
VEGETATION - Use scientific nam	es of plants			
	Absolute	Dominant	Indicator	<b>50/20 Thresholds</b> 20% 50%
Tree Stratum (Plot size:)	% Cover	Species?	Status	Tree Stratum
1.		•		Sapling/Shrub Stratum
2.				Herb Stratum <u>21</u> <u>52</u>
3.				Woody Vine Stratum
4.				
5.				Number of Dominant Species
		= Total Co	ver	That Are OBL, FACW, or FAC: <u>2</u> (A)
Sapling/Shrub Stratum (Plot size:				Total Number of Dominant
1.				Species Across All Strata: <u>2</u> (B)
2.				Percent of Dominant Species
3.				That Are OBI, FACW, or FAC: <u>100</u> (A/B)
4.				Prevalence Index worksheet:
5.				Total % Cover of. Multiply by:
	:	= Total Co	ver	OBL species         x 1 =           FACW species            x 2 =
Herb Stratum (Plot size: <u>5 ft.</u> )				FAC species x 2 =
1. Persicaria hydropiper	60	Х	OBL	FACU species x 4 =
2. Scirpus atrovirens	35	Х	OBL	UPL species x 5 =
3. Eleocharis obtusa	7		OBL	Column Totals: (A) (B)
4. Alepocuris pratensis	2		FAC	Prevalence Index = B/A =
5.				Hydrophytic Vegetation Indicators:
6.				Rapid Test for Hydrophytic Vegetation
7.				Dominance Test is >50%
8. 9.				$\square$ Prevalence Index is $\leq 3.0^1$
10.				Morphological Adaptations' (Provide supporting
11.				data in Remarks or on a separate sheet)
12.				Problematic Hydrophytic Vegetation' (Explain)
	104	= Total Cov	ver	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Woody Vine Stratum (Plot size:)				Definitions of Vegetation Strata:
1. 2.				Tree – Woody plants 3 in. (7.6 cm) or more in diameter at
		= Total Cov	ver	breast height (DBH), regardless of height. <b>Sapling/shrub</b> – Woody plants less than 3 in. DBH and
Remarks: (Include photo numbers here of				greater than 3.28 ft (1 m) tall.
present; data point within small shallow	basin, slightly lower than u	ipland poin	it (DP3) on	<b>Herb</b> – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
transect.				Woody vines – All woody vines greater than 3.28 ft in height.
				Hydrophytic Vegetation Present? Yes <u>No</u> No

epth	Matrix			Redox Fea				
nches)	Color (moist)	%	Color (moist	) %	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-4	10YR 3/2	100					sand	
4-12	10YR 2/1	98	5YR 3/4	2	С	М	sand	
12-16	7.5YR 2.5/1	99	G1 6/5G	1	D	М	sand	
<i>/</i> ·	Concentration, D=	Depletion	, RM=Reduced	Matrix, CS=	=Covered o	r Coated San	d Grains.	<sup>2</sup> Location: PL=Pore Lining, M=Matrix.
<u> </u>	oil Indicators:				. (66)			Indicators for Problematic Hydric
Histo				ripped Mat				2 cm Muck - (A10) (LRR K, L, MLRA 149
	c Epipedon (A2)					R, MLRA 1	-	Coast Prairie Redox (A16) (LRR K, L, I
	k Histic (A3)						MLRA 149 E	
	rogen Sulfide (A4)	)				(LRR R, ML	_	Dark Surface (S7) (LRR K, L)
C Strat	tified Layers (A5)		<u> </u>	bamy Muck	y Mineral (F	<sup>=</sup> 1) (LRR K,	L)	Polyvalue Below Surface (S8) (LRR K,
🔲 Depl	eted Below Dark	Surface (A	11) 🔲 Lo	oamy Gleye	ed Matrix (F	2)		Thin Dark Surface (S9) (LRR K, L)
Thicl	k Dark Surface (A	.12)	<u> </u>	epleted Ma	trix (F3)			Iron-Manganese Masses (F12) <b>(LRR K, L,</b>
Sanc	ly Mucky Mineral	(S1)	<u> </u>	edox Dark S	Surface (F6	)		Piedmont Floodplain Soils (F19) <b>(MLRA 14</b>
C Sanc	ly Gleyed Matrix (	(S4)	<u> </u>	epleted Dai	rk Surface (	(F7)		Mesic Spodic (TA6) <b>(MLRA 144A, 145, 149</b>
🛛 Sanc	ly Redox (S5)		<u> </u>	edox Depre	essions (F8)			Red Parent Material (F21)
ndicators	of hydrophytic veg	getation an	d wetland hydro	ology must l	be present,	unless disturl	oed or	Very Shallow Dark Surface (TF12)
oblematic		-						Other (Explain in Remarks)
Restricti	ve Layer (if obs	erved):						
Type:								Hydric Soil Present? 🛛 Yes 🔟 No 🗌
Depth (in	ches):							
	ches): Hydric soils are p	oresent. H	ydric soils india	cator Sandy	v Redox (S5	i) is satisfied		
	Hydric soils are p	present. H	ydric soils india	cator Sandy	/ Redox (S5	i) is satisfied		
Remarks: <b>/ DROL</b>	Hydric soils are p		ydric soils india	cator Sandy	/ Redox (S5	i) is satisfied		
Remarks: (DROL) Wetland	Hydric soils are p OGY	cators:				i) is satisfied		Secondary Indicators (minimum of two require
Remarks: <b>(DROL</b> Wetland Primary In	Hydric soils are p OGY Hydrology Indi ndicators (minimu	cators:	s required; che	ck all that a	apply)	·		Secondary Indicators (minimum of two require
Remarks: <b>DROL</b> Wetland Primary In Sur	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1)	cators: m of one i	s required; che	ck all that a		aves (B9)		Secondary Indicators (minimum of two require
Remarks: <b>(DROL</b> Wetland Primary In Surn Hig	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2	cators: m of one i	s required; che	ck all that a	apply) -Stained Lea c Fauna (B1	aves (B9) .3)		Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10)
Remarks: (DROL Wetland Primary In Surt Higl Satu	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3)	cators: m of one i	s required; che  	ck all that a	apply) -Stained Lea c Fauna (B1 eposits (B1)	aves (B9) .3) 5)		Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16)
Remarks: (DROL Wetland Primary II Sur Higl Satu Wat	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1)	cators: m of one i ?)	s required; che  	ck all that a Water- Aquatic Marl D Hydrog	apply) -Stained Lea c Fauna (B1 eposits (B1) gen Sulfide	aves (B9) .3) 5) Odor (C1)		Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2)
Remarks: <b>/DROL</b> Wetland Primary II Sur Higl Satu Wat Sed	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B	cators: m of one i ?)	s required; che     	ck all that a	apply) Stained Lea c Fauna (B1 eposits (B1 gen Sulfide ed Rhizosph	aves (B9) .3) 5) Odor (C1) ieres on Livir	g Roots (C3)	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8)
Remarks: (DROL Wetland Primary II Suri Higi Satu Satu Sed Drif	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B3)	cators: m of one i 2) 22)	s required; che     	ck all that a Water- Aquatic Marl D Hydrog Oxidize	apply) -Stained Lea c Fauna (B1 eposits (B1 gen Sulfide ed Rhizosph ice of Reduc	aves (B9) .3) 5) Odor (C1) ieres on Livir ced Iron (C4)	g Roots (C3)	Secondary Indicators (minimum of two require 
Remarks: (DROL Wetland Primary II Sur Higl Satu Satu Sed Drif Alga	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4	cators: m of one i 2) 22)	s required; che     	ck all that a Water- Aquatic Marl D Hydrog Oxidize Presen Recent	apply) -Stained Lea c Fauna (B1 eposits (B1 gen Sulfide ed Rhizosph ice of Reduc t Iron Reduc	aves (B9) .3) 5) Odor (C1) eres on Livir ced Iron (C4) ction in Tillec	g Roots (C3)	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1)
Remarks: <b>/DROL</b> Wetland Primary II Suri Inori	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B1) t Deposits (B3) al Mat or Crust (B4 n Deposits (B5)	<b>icators:</b> <u>m of one i</u> 2) 22) 4)	<u>s required; che</u> - - - - - - - - - - -	ck all that a       Water-       Aquation       Aquation       Hydrog       Oxidize       Presen       Recent       Thin M	apply) Stained Lea c Fauna (B1 gen Sulfide ed Rhizosph ace of Reduc t Iron Reduc luck Surface	aves (B9) (3) 5) Odor (C1) eres on Livir ced Iron (C4) ction in Tillec e (C7)	g Roots (C3)	Secondary Indicators (minimum of two require 
Remarks: <b>/DROL</b> Wetland Primary II Suri Higi Satu Sed Sed Drif Alga Iror Inu	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on	<b>cators:</b> <u>m of one i</u> 2) 22) 4) Aerial Ima	<u>s required; che</u>       agery(B7)	ck all that a       Water-       Aquation       Aquation       Hydrog       Oxidize       Presen       Recent       Thin M	apply) -Stained Lea c Fauna (B1 eposits (B1 gen Sulfide ed Rhizosph ice of Reduc t Iron Reduc	aves (B9) (3) 5) Odor (C1) eres on Livir ced Iron (C4) ction in Tillec e (C7)	g Roots (C3)	Secondary Indicators (minimum of two requires 
Remarks: <b>/DROL</b> Wetland Primary II 	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B1) t Deposits (B3) al Mat or Crust (B4 n Deposits (B5)	<b>cators:</b> <u>m of one i</u> 2) 22) 4) Aerial Ima	<u>s required; che</u>       agery(B7)	ck all that a       Water-       Aquation       Aquation       Hydrog       Oxidize       Presen       Recent       Thin M	apply) Stained Lea c Fauna (B1 gen Sulfide ed Rhizosph ace of Reduc t Iron Reduc luck Surface	aves (B9) (3) 5) Odor (C1) eres on Livir ced Iron (C4) ction in Tillec e (C7)	g Roots (C3)	Secondary Indicators (minimum of two require 
Remarks: <b>/DROL</b> Wetland Primary II 	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on arsely Vegetated C	<b>cators:</b> <u>m of one i</u> 2) 22) 4) Aerial Ima	<u>s required; che</u>       agery(B7)	ck all that a       Water-       Aquation       Aquation       Hydrog       Oxidize       Presen       Recent       Thin M	apply) Stained Lea c Fauna (B1 gen Sulfide ed Rhizosph ace of Reduc t Iron Reduc luck Surface	aves (B9) (3) 5) Odor (C1) eres on Livir ced Iron (C4) ction in Tillec e (C7)	g Roots (C3)	Secondary Indicators (minimum of two requires 
Remarks: <b>/DROL</b> Wetland Primary II 	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on	<b>cators:</b> <u>m of one i</u> 2) 22) 4) Aerial Ima	s required; che       agery(B7)   agery(B7)   	ck all that a U Water- U Aquati U Marl D U Hydrog U Oxidize U Presen U Recent U Thin M U Other	apply) Stained Lea c Fauna (B1 gen Sulfide ed Rhizosph ace of Reduc t Iron Reduc luck Surface	aves (B9) (3) 5) Odor (C1) eres on Livir ced Iron (C4) ction in Tillec e (C7)	g Roots (C3)	Secondary Indicators (minimum of two requires
Remarks: /DROL Wetland Primary II 	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on arsely Vegetated C	<b>cators:</b> <u>m of one i</u> 2) 22) 4) Aerial Ima concave Su Yes	s required; che             	ck all that a	apply) -Stained Lea c Fauna (B1 eposits (B1) gen Sulfide ed Rhizosph ace of Reduc t Iron Reduc luck Surface (Explain in I	aves (B9) .3) 5) Odor (C1) eres on Livir ced Iron (C4) ction in Tillec e (C7) Remarks) 5):	g Roots (C3)	Secondary Indicators (minimum of two requires Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Stunted or Stressed Plants (D1) Shallow Aquitard (D3) FAC-Neutral Test (D5) Microtopographic Relief (D4)
Remarks: /DROL Wetland Primary II 	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4 h Deposits (B5) ndation Visible on arsely Vegetated C servations: Vater Present?	cators: <u>m of one i</u> 2) 32) 4) Aerial Ima concave Su Yee Yee	s required; che             	ck all that a	apply) -Stained Lea c Fauna (B1 eposits (B1 gen Sulfide ed Rhizosph ace of Reduc t Iron Reduc luck Surface (Explain in F epth (inches epth (inches	aves (B9) .3) 5) Odor (C1) eres on Livir ced Iron (C4) ction in Tillec ction in Tillec	g Roots (C3)	Secondary Indicators (minimum of two required         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Saturation Visible on Aerial Imagery (C9)         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)         Shallow Aquitard (D3)         FAC-Neutral Test (D5)         Microtopographic Relief (D4)
Remarks: <b>/DROL</b> Wetland Primary II 	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on arsely Vegetated C servations: Vater Present? ble Present? n Present?	cators: <u>m of one i</u> 2) 32) 4) Aerial Ima concave Su Yee Yee	s required; che             	ck all that a	apply) -Stained Lea c Fauna (B1 eposits (B1) gen Sulfide ed Rhizosph ace of Reduc t Iron Reduc luck Surface (Explain in I	aves (B9) .3) 5) Odor (C1) eres on Livir ced Iron (C4) ction in Tillec ction in Tillec	g Roots (C3)	Secondary Indicators (minimum of two required         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Saturation Visible on Aerial Imagery (C9)         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)         Shallow Aquitard (D3)         FAC-Neutral Test (D5)         Microtopographic Relief (D4)
Remarks: <b>/DROL</b> Wetland Primary II 	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4 h Deposits (B3) al Mat or Crust (B4 h Deposits (B5) ndation Visible on arsely Vegetated C servations: Vater Present? ble Present? h Present? capillary fringe)	cators: <u>m of one i</u> 2) 2) 4) Aerial Ima concave Su Yee Yee Yee	s required; che 	ck all that a	apply) -Stained Lea c Fauna (B1 eposits (B1) gen Sulfide ed Rhizosph ace of Reduc t Iron Reduc luck Surface (Explain in R epth (inches epth (inches	aves (B9) .3) 5) Odor (C1) teres on Livir ced Iron (C4) ction in Tillec e (C7) Remarks) 5): 5): 5):	g Roots (C3)	Secondary Indicators (minimum of two required)         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Saturation Visible on Aerial Imagery (C9)         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)         Shallow Aquitard (D3)         FAC-Neutral Test (D5)         Microtopographic Relief (D4)         Indicators of         Wetland Hydrology Present?         Yes_N_ No_
Remarks: /DROL Wetland Primary II 	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on arsely Vegetated C servations: Vater Present? ble Present? capillary fringe) Recorded Data (st	cators: <u>m of one i</u> 2) 32) 4) Aerial Ima ioncave Su Yee Yee Yee	s required; che 	ck all that a         Water-         Aquation         Aquation         Hydrog         Oxidize         Presen         Recent         Thin M         Other         Other         Deg         Deg         well, aerial	apply) Stained Lea c Fauna (B1 eposits (B1) gen Sulfide ed Rhizosph ace of Reduc t Iron Reduc t Iron Reduc t Iron Reduc (Explain in R epth (inches epth (inches epth (inches photos, pre	aves (B9) (3) 5) Odor (C1) eres on Livir ced Iron (C4) ction in Tillec (C7) Remarks) 5): (C7) Remarks) 5): (C7) Remarks)	g Roots (C3) Soils (C6)	Secondary Indicators (minimum of two required)         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Saturation Visible on Aerial Imagery (C9)         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)         Shallow Aquitard (D3)         FAC-Neutral Test (D5)         Microtopographic Relief (D4)         Indicators of         Wetland Hydrology Present?         Yes       No
Remarks: <b>/DROL</b> Wetland Primary II 	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4 h Deposits (B3) al Mat or Crust (B4 h Deposits (B5) ndation Visible on arsely Vegetated C servations: Vater Present? ble Present? h Present? capillary fringe)	cators: m of one i 2) 32) 4) Aerial Ima concave Su Yes Yes Yes Yes	s required; che 	ck all that a         Water-         Aquation         Aquation         Hydrog         Oxidize         Presen         Recent         Thin M         Other         Other         Deg         Deg         well, aerial	apply) Stained Lea c Fauna (B1 eposits (B1) gen Sulfide ed Rhizosph ace of Reduc t Iron Reduc t Iron Reduc t Iron Reduc (Explain in R epth (inches epth (inches epth (inches photos, pre	aves (B9) (3) 5) Odor (C1) eres on Livir ced Iron (C4) ction in Tillec (C7) Remarks) 5): (C7) Remarks) 5): (C7) Remarks)	g Roots (C3) Soils (C6)	Secondary Indicators (minimum of two required)         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Saturation Visible on Aerial Imagery (C9)         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)         Shallow Aquitard (D3)         FAC-Neutral Test (D5)         Microtopographic Relief (D4)         Indicators of         Wetland Hydrology Present?         Yes       No         Hable:



Photo 4. Wetland 2. Data point 3, view to the west.

Project/Site: Crystal Airport (MIC) Airfield Improvements		City	/County: <u>Henne</u>	epin Sampling Date: June 5, 2018
Applicant/Owner: Metropolitan Airports Commission		Stat	e: <u>Minnesota</u>	Sample Point: DP4
Investigator(s): Brauna Hartzell and Kim Shannon, Meac	l & Hunt, In	с.	Section	, Township, Range: <u>S33, T119N, R21W</u>
Landform (hillslope, terrace, etc.): terrace/plain	Local	relief (con	icave, convex, i	none): <u>none</u> Slope (%): <u>&lt;1%</u>
				-93.355921 Datum: WGS84
				NWI classification:
Are climatic hydrologic conditions on the site typical for th		-		
Are Vegetation, Soil, or Hydrology				nal Circumstances" present? Yes No
	-			
Are Vegetation, Soil, or Hydrology SUMMARY OF FINDINGS - Attach site map sh				d, explain any answers in Remarks.)
SUMMART OF FINDINGS - Attach site map sr	lowing sa	mpling p		ns, transects, important features, etc.
Hydrophytic Vegetation Present? Yes	No	$\boxtimes$	Is the Sam	pled Area
Hydric Soil Present? Yes	No	$\boxtimes$	within a W	etland? YesNo
Wetland Hydrology Present? Yes	No	$\boxtimes$	If yes, option	nal Wetland Side ID:
Remarks: (Explain alternative procedures here or in a	separate re	eport.) A V	VETS analysis o	of the antecedent precipitation indicates the hydrologic
conditions on the site were drier than normal at the t	ime of inves	stigation.		
VEGETATION - Use scientific names of plants				
	Absolute	Dominant	t Indicator	<b>50/20 Thresholds</b> 20% 50%
Tree Stratum (Plot size: <u>30 ft.</u> )	% Cover	Species?	Status	Tree Stratum         12         30
1. Acer negundo	30	X	FAC	Sapling/Shrub Stratum <u>20</u> <u>50</u>
2. Ulmus pumila	20	Х	FACU	Herb Stratum <u>11</u> <u>27.5</u>
2. Ulmus americana	10		FACW	Woody Vine Stratum
	10		TACW	Dominance Test worksheet:
5.	_			Number of Dominant Species
5.	60	= Total Co	over	That Are OBL, FACW, or FAC: <u>3</u> (A)
Sapling/Shrub Stratum (Plot size: 15 ft.)	00			Total Number of Dominant
	90	v	FAC	Species Across All Strata: <u>5</u> (B)
1. Rhamnus cathartica	10	X		Percent of Dominant Species
2. Fraxinus pennsylvanica	10 5		FACW	That Are OBI, FACW, or FAC: <u>60</u> (A/B)
3. Lonicera x bella	5		FACU	Prevalence Index worksheet:
4. 5.				Total % Cover of. Multiply by:
5.	105	Tatal C		OBL species x 1 =
Have Churchange (Diet sizes E & )	105	= Total Co	over	FACW species $\underline{20}$ x 2 = $\underline{40}$
<u>Herb Stratum</u> (Plot size: <u>5 ft.</u> )	го	v	FAC	FAC species $170$ x 3 = $510$
1. Rhamnus cathartica	50	Х	FAC	FACU species $\underline{40}$ x 4 = $\underline{160}$
2. Allaria petiolata	5		FACU	UPL species x 5 =
3.				Column Totals: <u>230</u> (A) <u>710</u> (B)
4.				Prevalence Index = $B/A = 3.09$
5.				Hydrophytic Vegetation Indicators:
6.				Rapid Test for Hydrophytic Vegetation
7.				Dominance Test is >50%
8.				Prevalence Index is $\leq 3.0^1$
9.				Morphological Adaptations' (Provide supporting
10.				data in Remarks or on a separate sheet)
11.				Problematic Hydrophytic Vegetation' (Explain)
12.				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be
	55	= Total Co	over	present, unless disturbed or problematic.
Woody Vine Stratum (Plot size:)	10	X	FACIL	Definitions of Vegetation Strata:
1. Parthenocissus quinquefolia	10	Х	FACU	Tree – Woody plants 3 in. (7.6 cm) or more in diameter at
2.	10	Tatal Ca		breast height (DBH), regardless of height.
		= Total Co		<b>Sapling/shrub</b> – Woody plants less than 3 in. DBH and
Remarks: (Include photo numbers here or on a separate	-		-	greater than 3.28 ft (1 m) tall.
not present. Fails Prevalence indicator at 3.09. Very lit	tie change i	n elevatio	n between the	<b>Herb</b> – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
two data points.				<b>Woody vines</b> – All woody vines greater than 3.28 ft in height.
				Hydrophytic Vegetation Present?
				Yes No

Depth	Matrix			Redox Fe	atures			
inches)	Color (moist)	%	Color (moi	st) %	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-20	10YR 3/2	100					Sandy loar	m
20-22	10YR 6/3	100					sand	
Type: C=	Concentration, D=	Depletion	, RM=Reduce	d Matrix, CS	=Covered o	r Coated Sa	and Grains.	<sup>2</sup> Location: PL=Pore Lining, M=Matrix.
	oil Indicators:	•	,	,				Indicators for Problematic Hydric
Histo	osol (A1)			Stripped Ma	trix (S6)			2 cm Muck - (A10) (LRR K, L, MLRA 149
🔲 Histi	c Epipedon (A2)			Dark Surface	e (S7) <b>(LRF</b>	R R, MLRA	149B)	Coast Prairie Redox (A16) (LRR K, L,
D Blac	k Histic (A3)			Polyvalue Be	low Surface	(S8) <b>(LRR I</b>	R, MLRA 149 E	
🔲 Hydi	rogen Sulfide (A4)	)		Thin Dark S	urface (S9)	(LRR R, M	ILRA 149B)	Dark Surface (S7) (LRR K, L)
Strat	tified Layers (A5)			Loamy Muck	y Mineral (	F1) <b>(LRR K</b>	(, L)	Polyvalue Below Surface (S8) (LRR K,
	leted Below Dark	Surface (A		Loamy Gleye				Thin Dark Surface (S9) (LRR K, L)
	k Dark Surface (A		·	Depleted Ma				Iron-Manganese Masses (F12) (LRR K, L,
C Sand	dy Mucky Mineral	(S1)		Redox Dark	Surface (F6	5)		Piedmont Floodplain Soils (F19) (MLRA 14
Sanc	dy Gleyed Matrix (	(S4)		Depleted Da	rk Surface	(F7)		Mesic Spodic (TA6) (MLRA 144A, 145, 149
C Sand	dy Redox (S5)			Redox Depr	essions (F8)	)		Red Parent Material (F21)
Indicators	of hydrophytic veg	getation an	nd wetland hyd	Irology must	be present,	unless distu	irbed or	Very Shallow Dark Surface (TF12)
roblematic		-						Other (Explain in Remarks)
Restricti	ive Layer (if obs	erved):						
Type:								Hydric Soil Present? Yes 🔲 No 🛛
Depth (in	iches):							
Remarks:	: Hydric soils are i	not preser	nt. Does not r	neet hvdric	soils criteria			
YDROL								
Wetland	l Hydrology Indi	cators:						
	ndicators (minimu		is required; cl	neck all that	apply)			Secondary Indicators (minimum of two require
	face Water (A1)			_	-Stained Lea	aves (89)		Surface Soil Cracks (B6)
	h Water Table (A2	2)			ic Fauna (Bi			Drainage Patterns (B10)
-	uration (A3)	-)			Deposits (B1			
	ter Marks (B1)				gen Sulfide			Dry-Season Water Table (C2)
	liment Deposits (B	27)			-	• •	ing Roots (C3)	
	ft Deposits (B3)	2)			nce of Redu			Saturation Visible on Aerial Imagery (C9)
	al Mat or Crust (B4	4)		_			ed Soils (C6)	Stunted or Stressed Plants (D1)
		+)					eu 30115 (CO)	
	n Deposits (B5)	مینوا Tree			Auck Surface			Geomorphic Position (D2)
	Indation Visible on			Other	(Explain in	Remarks)		Shallow Aquitard (D3)
_ <u> </u> Spa	arsely Vegetated C	oncave Su	IFIACE (B8)					FAC-Neutral Test (D5)
Field Of								Microtopographic Relief (D4)
	servations:	V.	- 🗆 🔹		anth (:	-).		Indicators of
	Vater Present?				epth (inches			Wetland Hydrology Present?
	ble Present? n Present?				epth (inches epth (inches			$Yes\_\square No\_\boxtimes$
	capillary fringe)	re	∍∟ เพบ			»)• <u> </u>		
	Recorded Data (st	ream gau	ge, monitorin	g, well, aeria	l photos, pr	evious inspe	ections), if avai	lable:
Remarks	: Wetland hydrolo	gy is neith	ner present o	r indicated.				
Photo: S	ee Photo 11							



Photo 11. Wetland 3. Data point 4, view to the north.

Project/Site: Crystal Airport (MIC) Airfield Improvemen	ts	City/	/County: <u>Henn</u>	epin Sampling Date: June 5, 2018
Applicant/Owner: Metropolitan Airports Commission		State	e: <u>Minnesota</u>	Sample Point: DP5
Investigator(s): Brauna Hartzell and Kim Shannon, Mea	ad & Hunt, In	с.	Section	n, Township, Range: <u>S33, T119N, R21W</u>
Landform (hillslope, terrace, etc.): basin	Local	relief (con	cave, convex,	none): <u>concave</u> Slope (%): <u>&lt;1%</u>
Subregion (LRR or MLRA): K/155 Lat:	45.068836		Long:	-93.355811 Datum: WGS84
Soil Map Unit Name: Forada sandy loam, 0 to 2 percen	t slopes (D10	)A)		NWI classification: PFO
Are climatic hydrologic conditions on the site typical for t	his time of ye	ear? Yes _	🗌 No 🗵	(If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology	significantly	disturbed?	Are "Norr	nal Circumstances" present? Yes <u>No</u>
Are Vegetation, Soil, or Hydrology	-			d, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map s				
Hydrophytic Vegetation Present? Yes 🛛	No	_	Is the Sam	
Hydric Soil Present? Yes 🖂	No		within a W	
Wetland Hydrology Present? Yes 🖂	No		If yes, optio	nal Wetland Side ID: <u>3</u>
Remarks: (Explain alternative procedures here or in	a separate r	eport.) A W	/ETS analysis o	of the antecedent precipitation indicates the hydrologic
conditions on the site were drier than normal at the				······································
VEGETATION - Use scientific names of plant	s			1
	Absolute			50/20 Thresholds         20%         50%           Tree Stratum         8         20
Tree Stratum (Plot size: <u>30 ft.</u> )	% Cover	Species?	Status	Tree Stratum <u>8</u> <u>20</u>
1. Fraxinus nigra	30	Х	FACW	Sapling/Shrub Stratum         8         21           Herb Stratum         11         47.5
2. Acer negundo	10	Х	FAC	Herb Stratum         11         47.5           Woody Vine Stratum         2         10
3.				Dominance Test worksheet:
4.				
5.				Number of Dominant Species
	40	= Total Co	over	That Are OBL, FACW, or FAC: <u>6</u> (A)
Sapling/Shrub Stratum (Plot size: <u>15 ft.</u> )				Total Number of Dominant
1. Fraxinus pennsylvanica	20	Х	FACW	Species Across All Strata: <u>7</u> (B)
2. Rhamnus cathartica	10	Х	FAC	Percent of Dominant Species
3. Prunus serotina	7		FACU	That Are OBI, FACW, or FAC: <u>86</u> (A/B) Prevalence Index worksheet:
4. Ulmus americana	5		FACW	Total % Cover of. Multiply by:
5.				OBL species          x 1 =
	42	= Total Co	over	FACW species         x 2 =
Herb Stratum (Plot size: <u>5 ft</u> )				FAC species x 3 =
1. Rubus idaeus	45	Х	FAC	FACU species x 4 =
2. Phalaris arundinacea	40	Х	FACW	UPL species         x 5 =
3.				Column Totals: (A) (B)
4.			-	Prevalence Index = $B/A =$
5.				Hydrophytic Vegetation Indicators:
6.				Rapid Test for Hydrophytic Vegetation
7.				Dominance Test is >50%
8.				Prevalence Index is $< 3.0^1$
9.				Morphological Adaptations' (Provide supporting
10.				data in Remarks or on a separate sheet)
11.				Problematic Hydrophytic Vegetation' (Explain)
12.	95	= Total Co	over	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Woody Vine Stratum (Plot size: 15 ft)				Definitions of Vegetation Strata:
1. Parthenocissus quinquefolia	20	Х	FACU	<b>Tree</b> – Woody plants 3 in. (7.6 cm) or more in diameter at
2.	20	= Total Co	ver	breast height (DBH), regardless of height. <b>Sapling/shrub</b> – Woody plants less than 3 in. DBH and
Remarks: (Include photo numbers here or on a separa	te sheet.) Hy	drophytic v	egetation is	greater than 3.28 ft (1 m) tall.
present. Also, <i>Carex</i> sp. within the wetland, <i>Vitis ripa</i>			-	Herb – All herbaceous (non-woody) plants, regardless of size,
Open canopy area within forested area.				and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.
				Hydrophytic Vegetation Present?
				Yes <u>No</u> No

Depth	Matrix			Redox Fea	atures			
(inches)	Color (moist)	%	Color (mois	:) %	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-5	7.5YR 2.5/1	100					Sandy loar	n
5-9	7.5YR 2.5/1	95	7.5YR 4/4	5	С	М	Sandy loar	n
9-11	10YR 2/1	100					Sandy loar	n
11-18	10YR 7/2	100					sand	
<sup>1</sup> Type: C=0	Concentration, D=	Depletion	, RM=Reduced	Matrix, CS=	=Covered or	· Coated Sa	and Grains.	<sup>2</sup> Location: PL=Pore Lining, M=Matrix.
	oil Indicators:	· ·	,	,				Indicators for Problematic Hydric
Histo	osol (A1)		<u> </u>	tripped Mat	rix (S6)			2 cm Muck - (A10) (LRR K, L, MLRA 149
🔲 Histi	c Epipedon (A2)			ark Surface	(S7) <b>(LRR</b>	R, MLRA	149B)	🔲 Coast Prairie Redox (A16) <b>(LRR K, L, R</b>
Black	k Histic (A3)		<u> </u>	olyvalue Belo	ow Surface (	(S8) <b>(LRR</b>	R, MLRA 149 E	3) 5 cm Peat or Mucky Peat (S3) (LRR K, L, I
Hydr	rogen Sulfide (A4)	)					ILRA 149B)	Dark Surface (S7) (LRR K, L)
Strat	tified Layers (A5)			oamy Muck			_	Polyvalue Below Surface (S8) (LRR K, I
	leted Below Dark	Surface (A		oamy Gleye		<i>,</i> .		Thin Dark Surface (S9) (LRR K, L)
	k Dark Surface (A		· · ·	epleted Mat				☐ Iron-Manganese Masses (F12) (LRR K, L,
	dy Mucky Mineral			edox Dark S		)		Piedmont Floodplain Soils (F19) (MLRA 149
	dy Gleyed Matrix (	• •		epleted Dar				Mesic Spodic (TA6) (MLRA 144A, 145, 1498
	dy Redox (S5)	- /		edox Depre		,		Red Parent Material (F21)
	of hydrophytic veg	etation an				inless distu	irhed or	Very Shallow Dark Surface (TF12)
problematic				ology maser	je presenc, t			Other (Explain in Remarks)
Restricti	ve Layer (if obs	erved):						
Remarks:	ches): Hydric soils are p	present. H	lydric soils indi	cator Redox	Dark Surfa	ace (F6) is	satisfied.	
YDROL								
	Hydrology Indi		io vogujuodu ob					
	ndicators (minimu	m of one i		_				Secondary Indicators (minimum of two required
	face Water (A1)			U Water-				Surface Soil Cracks (B6)
-	h Water Table (A2	2)		Aquatio	•			Drainage Patterns (B10)
	uration (A3)		-	Marl D				Moss Trim Lines (B16)
	ter Marks (B1)		-		jen Sulfide (			Dry-Season Water Table (C2)
	liment Deposits (B	2)	-		•		ring Roots (C3)	Crayfish Burrows (C8)
_	t Deposits (B3)		-	_	ce of Reduc		•	Saturation Visible on Aerial Imagery (C9)
Alga	al Mat or Crust (B4	1)	-	Recent	Iron Reduc	tion in Tille	ed Soils (C6)	Stunted or Stressed Plants (D1)
Iror	n Deposits (B5)		-	Thin M	uck Surface	e (C7)		Geomorphic Position (D2)
Inu	ndation Visible on	Aerial Ima	agery(B7)	Other (	(Explain in F	Remarks)		Shallow Aquitard (D3)
Spa	arsely Vegetated C	oncave Su	urface (B8)					FAC-Neutral Test (D5)
								Microtopographic Relief (D4)
Field Ob	servations:							- H
Surface W	Vater Present?		s 🗌 🛛 No 🛛		pth (inches			Indicators of
Water Tal	ble Present?		s 🗌 🛛 No 🛛		pth (inches			Wetland Hydrology Present? Yes_⊠ No_□
	n Present?	Ye	s 🗌 🛛 No 🛛	🖄 De	pth (inches	):		
	conillon (frimes)							
(includes	capillary fringe) Recorded Data (st	ream gau	ge, monitoring	well, aerial	photos, pre	evious inspe	ections), if avail	lable:
(includes		ream gau	ge, monitoring	well, aerial	photos, pre	evious inspe	ections), if avail	able:
(includes Describe I				well, aerial	photos, pre	evious inspe	ections), if avail	lable:



Photo 12. Wetland 3. Data point 5, view to the east.

					epin Sampling Date: June 5, 2018
Applicant/Owner: Metropolitan Airports	Commission		State	: Minnesota	Sample Point: DP 6
÷ ()					, Township, Range: <u>S33, T119N, R21W</u>
Landform (hillslope, terrace, etc.): terra	ace	Local r	elief (conc	ave, convex, i	none): <u>none</u> Slope (%): <u>&lt;1%</u>
Subregion (LRR or MLRA): K/155	Lat: <u>45.06</u>	69048		Long:	-93.352784 Datum: WGS84
Soil Map Unit Name: Seelyeville and Ma	<u>rkey soils, depressio</u>	nal, 0 to :	l percent s	slopes (D30A)	NWI classification:
Are climatic hydrologic conditions on the	site typical for this ti	me of yea	r?Yes	No	(If no, explain in Remarks.)
Are Vegetation $\underline{\square}$ , Soil $\underline{\square}$ , or F	lydrology 🔟 sign	ificantly di	sturbed?	Are "Norm	nal Circumstances" present? Yes 🗌 No 🛛
Are Vegetation, Soil, or ⊦	lydrology 🔲 natu	urally prob	lematic?	(If needed	d, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attac	h site map show	ving san	npling p	oint locatio	ns, transects, important features, etc.
Hydrophytic Vegetation Present?	Yes 🗌	No	⊲		
				Is the Sam	
Hydric Soil Present?	Yes 🛛	No		within a W	
Wetland Hydrology Present?	Yes 🗌	No 🛛			nal Wetland Side ID:
	n normal at the time	of invest	igation. Ar		of the antecedent precipitation indicates the hydrologic ularly; hydrologic alterations to surrounding area including
VEGETATION - Use scientific na					
	A	bsolute I	Dominant	Indicator	<b>50/20 Thresholds</b> 20% 50%
Tree Stratum (Plot size:)	%	6 Cover	Species?	Status	Tree Stratum
1.			-1		Sapling/Shrub Stratum
2.					Herb Stratum <u>20</u> <u>50</u>
3.					Woody Vine Stratum
4.					Dominance Test worksheet:
5.					Number of Dominant Species
		=	Total Cov	/er	That Are OBL, FACW, or FAC: <u>0</u> (A)
Sapling/Shrub Stratum (Plot size:	)				Total Number of Dominant
1.	_/				Species Across All Strata: <u>2</u> (B)
2.					Percent of Dominant Species
3.					That Are OBI, FACW, or FAC: <u>0</u> (A/B)
4.					Prevalence Index worksheet:
5.					Total % Cover of. Multiply by:
		-	· Total Cov	/er	OBL species x 1 =
<u>Herb Stratum</u> (Plot size: <u>5 ft</u> )					FACW species $x 2 = $
1. Bromus inermis		35	Х	UPL	FAC species         x 3 =           FACU species            x 4 =
2. Poa pratensis		30	Х	FACU	FACU species         x 4 =           UPL species         x 5 =
3. Stellaria meadia		15		FACU	Column Totals: (A) (B)
4. Trifolium repens		10		FACU	Prevalence Index = $B/A = $
5. <i>Plantago major</i>		5		FACU	Hydrophytic Vegetation Indicators:
6. Taraxacum officinale		5		FACU	Rapid Test for Hydrophytic Vegetation
7.					Dominance Test is >50%
8.					Prevalence Index is $<3.0^1$
9.					Morphological Adaptations' (Provide supporting
10.					data in Remarks or on a separate sheet)
11.					Problematic Hydrophytic Vegetation' (Explain)
12.		100	Tatal C		<sup>1</sup> Indicators of hydric soil and wetland hydrology must be
Woody Vine Stratum (Plat size)	、	100 =	Total Cov	ver	present, unless disturbed or problematic.
Woody Vine Stratum (Plot size:	)				Definitions of Vegetation Strata:
2.					Tree – Woody plants 3 in. (7.6 cm) or more in diameter at
<u> </u>		_	· Total Cov	/er	breast height (DBH), regardless of height.
Remarks: (Include photo numbers here	or on a constate ch				<b>Sapling/shrub</b> – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
	or on a separate she	сес.) пуа		eyelalionis	Herb – All herbaceous (non-woody) plants, regardless of size,
not present.					and woody plants less than 3.28 ft tall.
					Woody vines – All woody vines greater than 3.28 ft in height.
					Hydrophytic Vegetation Present?
					Yes No

in ala a a l	Matrix			Redox Fea	atures			
inches)	Color (moist)	%	Color (moist	) %	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-20	2.5/N	100					loam	
Type: C=	Concentration, D=	Depletion F	RM=Reduced	Matrix CS=	=Covered o	r Coated San	d Grains	<sup>2</sup> Location: PL=Pore Lining, M=Matrix.
<i>/</i> ·	oil Indicators:							Indicators for Problematic Hydric
Histo			🗆 s	tripped Mat	rix (S6)			2 cm Muck - (A10) (LRR K, L, MLRA 149
	c Epipedon (A2)					R, MLRA 1	49B)	Coast Prairie Redox (A16) (LRR K, L, I
	k Histic (A3)						MLRA 149 B	_
	rogen Sulfide (A4)	h				(LRR R, ML		Dark Surface (S7) (LRR K, L)
	tified Layers (A5)	/			. ,	=1) (LRR K,	-	Polyvalue Below Surface (S8) (LRR K,
	leted Below Dark S	Surface (A1		barny Flack			-)	Thin Dark Surface (S9) (LRR K, L)
	k Dark Surface (A			epleted Mai		<i>_</i> )		☐ Iron-Manganese Masses (F12) (LRR K, L,
	dy Mucky Mineral			edox Dark S		<u>۱</u>		Piedmont Floodplain Soils (F19) (MLRA 14
	dy Gleyed Matrix (			epleted Dark				Pleamont Hoodplain Solis (F19) (MLRA 14 Mesic Spodic (TA6) (MLRA 144A, 145, 149
	dy Redox (S5)	, <del>, , , , , , , , , , , , , , , , , , </del>		edox Depre				Mesic Specie (1740) (Micros 1444, 145, 149
roblematic	of hydrophytic veg	jetation and	wetland hydr	ology must i	be present,	uniess disturt	ed or	Uther (Eveloin in Remarks)
								Other (Explain in Remarks)
	ive Layer (if obse	erveu):						Hydric Soil Present? Yes 🖂 No 🗌
Type:								
Depth (in	icnes):							
	Hydric soils are p	present. Hyd	tric soils indi	cator Thick	Dark Surfa	ce (A12) is s	atisfied.	
YDROL								
	l Hydrology Indi							
Primary I	ndicators (minimu	m of one is I	required; che	ck all that a	ipply)			Secondary Indicators (minimum of two required
Sur	face Water (A1)		-	Water-	Stained Lea	aves (B9)		Surface Soil Cracks (B6)
Hig	h Water Table (A2	2)	-	C Aquatio	c Fauna (B1	.3)		Drainage Patterns (B10)
	uration (A3)		-	Marl D	eposits (B1	5)		Mass Trins Lines (D1C)
Sat								Moss Trim Lines (B16)
	ter Marks (B1)		_	Hydrog	gen Sulfide	Odor (C1)		Moss Trim Lines (B16) Dry-Season Water Table (C2)
Wa	ter Marks (B1) liment Deposits (B	2)	-		•	. ,	g Roots (C3)	
Wai	. ,	2)	-		ed Rhizosph	. ,	,	Dry-Season Water Table (C2) Crayfish Burrows (C8)
Wai Sed Drif	liment Deposits (B		- -	Oxidize     Oxidize	ed Rhizosph ce of Reduc	eres on Livin		Dry-Season Water Table (C2) Crayfish Burrows (C8)
Wai Sed Drif Alga	liment Deposits (B ft Deposits (B3) al Mat or Crust (B4		-	Oxidize     Oxidize     Presen     Recent	ed Rhizosph ce of Reduc : Iron Reduc	eres on Livin ced Iron (C4) ction in Tilled		Dry-Season Water Table (C2)     Crayfish Burrows (C8)     Saturation Visible on Aerial Imagery (C9)     Stunted or Stressed Plants (D1)
Wat Sed Drif Alga Iror	diment Deposits (B ft Deposits (B3) al Mat or Crust (B4 n Deposits (B5)	4)	-	Oxidize     Oxidize     Presen     Recent     Thin M	ed Rhizosph ce of Reduc Iron Reduc uck Surface	eres on Livin ced Iron (C4) ction in Tilled e (C7)		<ul> <li>Dry-Season Water Table (C2)</li> <li>Crayfish Burrows (C8)</li> <li>Saturation Visible on Aerial Imagery (C9)</li> <li>Stunted or Stressed Plants (D1)</li> <li>Geomorphic Position (D2)</li> </ul>
Wa Sed Drif Alga Iror Inu	liment Deposits (B ft Deposits (B3) al Mat or Crust (B4	1) Aerial Imag	ery(B7) _	Oxidize     Oxidize     Presen     Recent     Thin M	ed Rhizosph ce of Reduc : Iron Reduc	eres on Livin ced Iron (C4) ction in Tilled e (C7)		<ul> <li>Dry-Season Water Table (C2)</li> <li>Crayfish Burrows (C8)</li> <li>Saturation Visible on Aerial Imagery (C9)</li> <li>Stunted or Stressed Plants (D1)</li> <li>Geomorphic Position (D2)</li> <li>Shallow Aquitard (D3)</li> </ul>
Wa Sed Drif Alga Iror Inu	diment Deposits (B ft Deposits (B3) al Mat or Crust (B4 n Deposits (B5) Indation Visible on	1) Aerial Imag	ery(B7) _	Oxidize     Oxidize     Presen     Recent     Thin M	ed Rhizosph ce of Reduc Iron Reduc uck Surface	eres on Livin ced Iron (C4) ction in Tilled e (C7)		<ul> <li>Dry-Season Water Table (C2)</li> <li>Crayfish Burrows (C8)</li> <li>Saturation Visible on Aerial Imagery (C9)</li> <li>Stunted or Stressed Plants (D1)</li> <li>Geomorphic Position (D2)</li> <li>Shallow Aquitard (D3)</li> <li>FAC-Neutral Test (D5)</li> </ul>
Wa Wa Drif Drif Alga Iror Inu Spa	diment Deposits (B ft Deposits (B3) al Mat or Crust (B4 n Deposits (B5) Indation Visible on arsely Vegetated C	1) Aerial Imag	ery(B7) _	Oxidize     Oxidize     Presen     Recent     Thin M	ed Rhizosph ce of Reduc Iron Reduc uck Surface	eres on Livin ced Iron (C4) ction in Tilled e (C7)		<ul> <li>Dry-Season Water Table (C2)</li> <li>Crayfish Burrows (C8)</li> <li>Saturation Visible on Aerial Imagery (C9)</li> <li>Stunted or Stressed Plants (D1)</li> <li>Geomorphic Position (D2)</li> <li>Shallow Aquitard (D3)</li> </ul>
Wai Wai Drif Alga Inor Inu Spa	diment Deposits (B ft Deposits (B3) al Mat or Crust (B4 n Deposits (B5) Indation Visible on	4) Aerial Imag oncave Surfa	ery(B7) _ ace (B8)	Oxidize  Presen  Recent  Thin M  Other	ed Rhizosph ce of Reduc Tron Reduc uck Surface (Explain in I	eres on Livin ced Iron (C4) ction in Tilled e (C7) Remarks)		<ul> <li>Dry-Season Water Table (C2)</li> <li>Crayfish Burrows (C8)</li> <li>Saturation Visible on Aerial Imagery (C9)</li> <li>Stunted or Stressed Plants (D1)</li> <li>Geomorphic Position (D2)</li> <li>Shallow Aquitard (D3)</li> <li>FAC-Neutral Test (D5)</li> </ul>
Wa Wa Sed Drif Alga Iror Inu Spa Field Ob Surface V	diment Deposits (B ft Deposits (B3) al Mat or Crust (B4 n Deposits (B5) indation Visible on arsely Vegetated Co servations:	1) Aerial Imag	ery(B7) _ ace (B8) No [	C Oxidize  Presen  Recent  Thin M  Other  De  De	ed Rhizosph ce of Reduc : Iron Reduc uck Surface (Explain in F	eres on Livin ced Iron (C4) ction in Tilled e (C7) Remarks)		<ul> <li>Dry-Season Water Table (C2)</li> <li>Crayfish Burrows (C8)</li> <li>Saturation Visible on Aerial Imagery (C9)</li> <li>Stunted or Stressed Plants (D1)</li> <li>Geomorphic Position (D2)</li> <li>Shallow Aquitard (D3)</li> <li>FAC-Neutral Test (D5)</li> <li>Microtopographic Relief (D4)</li> </ul>
Wai Wai Sed Drif Alga Iror Inu Spa Field Ob Surface W Water Ta	diment Deposits (B ft Deposits (B3) al Mat or Crust (B4 n Deposits (B5) undation Visible on arsely Vegetated C servations: Vater Present?	4) Aerial Imag oncave Surfa Yes [	ery(B7) ace (B8)	Circle Construction Circl	ed Rhizosph ce of Reduc Tron Reduc uck Surface (Explain in I	eres on Livin ced Iron (C4) ction in Tilled e (C7) Remarks)		Dry-Season Water Table (C2)     Crayfish Burrows (C8)     Saturation Visible on Aerial Imagery (C9)     Stunted or Stressed Plants (D1)     Geomorphic Position (D2)     Shallow Aquitard (D3)     FAC-Neutral Test (D5)     Microtopographic Relief (D4)  Indicators of
Wai	diment Deposits (B ft Deposits (B3) al Mat or Crust (B4 n Deposits (B5) Indation Visible on arsely Vegetated C servations: Vater Present? ble Present? n Present? capillary fringe)	4) Aerial Imag ioncave Surfa Yes [ Yes [ Yes [	ery(B7) ace (B8) No [ No [ No [	Circle Content of Con	ed Rhizosph ce of Reduc : Iron Reduc uck Surface (Explain in I pth (inches pth (inches pth (inches	eres on Livin ced Iron (C4) ction in Tilled e (C7) Remarks) ;;;;;;;;;;;;;	Soils (C6)	Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3) FAC-Neutral Test (D5) Microtopographic Relief (D4) Indicators of Wetland Hydrology Present? Yes No_X
Wai	diment Deposits (B ft Deposits (B3) al Mat or Crust (B4 n Deposits (B5) Indation Visible on arsely Vegetated C servations: Vater Present? ble Present? n Present?	4) Aerial Imag ioncave Surfa Yes [ Yes [ Yes [	ery(B7) ace (B8) No [ No [ No [	Circle Content of Con	ed Rhizosph ce of Reduc : Iron Reduc uck Surface (Explain in I pth (inches pth (inches pth (inches	eres on Livin ced Iron (C4) ction in Tilled e (C7) Remarks) ;;;;;;;;;;;;;	Soils (C6)	Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3) FAC-Neutral Test (D5) Microtopographic Relief (D4) Indicators of Wetland Hydrology Present? YesNo_X_
Wai	diment Deposits (B ft Deposits (B3) al Mat or Crust (B4 n Deposits (B5) indation Visible on arsely Vegetated Co servations: Vater Present? ble Present? n Present? capillary fringe) Recorded Data (st	4) Aerial Imag oncave Surfa Yes [ Yes ] Yes ] ream gauge	ery(B7) ace (B8) No [ No [  , monitoring,	Circle Constraints  Circl	ed Rhizosph ce of Reduc : Iron Reduc uck Surface (Explain in I pth (inches pth (inches pth (inches	eres on Livin ced Iron (C4) ction in Tilled e (C7) Remarks) ;;;;;;;;;;;;;	Soils (C6)	Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3) FAC-Neutral Test (D5) Microtopographic Relief (D4) Indicators of Wetland Hydrology Present? YesNo_X_
Wai	diment Deposits (B ft Deposits (B3) al Mat or Crust (B4 n Deposits (B5) Indation Visible on arsely Vegetated C servations: Vater Present? ble Present? n Present? capillary fringe)	4) Aerial Imag oncave Surfa Yes [ Yes ] Yes ] ream gauge	ery(B7) ace (B8) No [ No [  , monitoring,	Circle Constraints  Circl	ed Rhizosph ce of Reduc : Iron Reduc uck Surface (Explain in I pth (inches pth (inches pth (inches	eres on Livin ced Iron (C4) ction in Tilled e (C7) Remarks) ;;;;;;;;;;;;;	Soils (C6)	Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3) FAC-Neutral Test (D5) Microtopographic Relief (D4) Indicators of Wetland Hydrology Present? Yes No_X



Photo 17. Wetland 4. Data points 6 through 9. View to the east.

Project/Site: Crystal Airport (MIC) Airfield Im	provements	_ City/County: <u>Henn</u>	epin Sampling Date: June 5, 2018
Applicant/Owner: Metropolitan Airports Com	mission	State: Minnesota	Sample Point: DP7
Investigator(s): Brauna Hartzell and Kim Sha	nnon, Mead & Hunt, Inc.	Section	n, Township, Range: <u>S33, T119N, R21W</u>
Landform (hillslope, terrace, etc.): basin	Local reli	ef (concave, convex,	none): <u>concave</u> Slope (%): <u>&lt;1%</u>
Subregion (LRR or MLRA): K/155	Lat: <u>45.069041</u>	Long:	-93.352884 Datum: WGS84
Soil Map Unit Name: Seelyeville and Markey	soils, depressional, 0 to 1 p	ercent slopes (D30A)	NWI classification: <u>PEM1</u>
Are climatic hydrologic conditions on the site t	ypical for this time of year?	Yes 🔲 No 🗵	(If no, explain in Remarks.)
Are Vegetation 🔣 , Soil 🔀 , or Hydro	logy 🔟 significantly disti	urbed? Are "Norn	nal Circumstances" present? Yes No
Are Vegetation, Soil, or Hydro	logy naturally probler	natic? (If neede	d, explain any answers in Remarks.)
			ons, transects, important features, etc.
			<i>· · ·</i> ·
, , , , , , , , , , , , , , , , , , , ,	Yes 🛛 No 🗌	Is the Sam	·
	Yes 🛛 No 🗌	within a W	
Wetland Hydrology Present?	res 🛛 🛛 No 🗌	If yes, optio	nal Wetland Side ID: <u>4</u>
	mal at the time of investiga	ation. Area mown reg	of the antecedent precipitation indicates the hydrologic ularly; hydrologic alterations to surrounding area including
<b>VEGETATION - Use scientific names</b>	of plants		
	Absolute Do	minant Indicator	<b>50/20 Thresholds</b> 20% 50%
Tree Stratum (Plot size:)	% Cover Sp	ecies? Status	Tree Stratum
1.			Sapling/Shrub Stratum
2.			Herb Stratum <u>19.5</u> <u>49.5</u>
3.			Woody Vine Stratum
4.			Dominance Test worksheet:
5.			Number of Dominant Species
5.		otal Cover	That Are OBL, FACW, or FAC: <u>1</u> (A)
Sapling/Shrub Stratum (Plot size:)			Total Number of Dominant
<u></u>			Species Across All Strata: <u>1</u> (B)
2.			Percent of Dominant Species
3.			That Are OBI, FACW, or FAC: <u>100</u> (A/B)
4.			Prevalence Index worksheet:
5.			Total % Cover of. Multiply by:
	= T	otal Cover	OBL species x 1 =
Herb Stratum (Plot size: <u>5 ft</u> )			FACW species x 2 =
1. Persicaria hydropiper	98	X OBL	FAC species x 3 =
2.			FACU species x 4 =
3.			UPL species x 5 =
4.			Column Totals: (A) (B)
5.			Prevalence Index = B/A =
6.			Hydrophytic Vegetation Indicators:
7.			Rapid Test for Hydrophytic Vegetation
8.			Dominance Test is >50%
9.			Prevalence Index is $\leq 3.0^1$
10.			Morphological Adaptations' (Provide supporting
11.			data in Remarks or on a separate sheet)
12.			Problematic Hydrophytic Vegetation' (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be
	<u> </u>	otal Cover	present, unless disturbed or problematic.
Woody Vine Stratum (Plot size:)			Definitions of Vegetation Strata:
1.			<b>Tree</b> – Woody plants 3 in. (7.6 cm) or more in diameter at
2.			breast height (DBH), regardless of height.
Domarka (Induda nhata numbara hara ar a		otal Cover	<b>Sapling/shrub</b> – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
Remarks: (Include photo numbers here or o			Herb – All herbaceous (non-woody) plants, regardless of size,
present. Few small bare spots present. Slip point (DP6) on transect.	July lower in elevation that	n uplanu sampling	and woody plants less than 3.28 ft tall. <b>Woody vines</b> – All woody vines greater than 3.28 ft in height.
			Hydrophytic Vegetation Present?
			Yes <u>No</u> No

epth	Matrix			Redox F	eatures			
iches)	Color (moist)	%	Color (mois	t) %	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-20	2.5/N	100					loam	
	ĺ							
								2
	Concentration, D=	Depletion	, RM=Reduce	d Matrix, C	S=Covered o	r Coated Sar	nd Grains.	<sup>2</sup> Location: PL=Pore Lining, M=Matrix.
<u> </u>	oil Indicators:			Studies in a d MA	-			Indicators for Problematic Hydric
Histo				Stripped M				2 cm Muck - (A10) (LRR K, L, MLRA 149
	c Epipedon (A2)				ce (S7) <b>(LRF</b>		-	Coast Prairie Redox (A16) (LRR K, L, I
	k Histic (A3)						, MLRA 149 E	
	rogen Sulfide (A4)	1			Surface (S9)	•	-	Dark Surface (S7) (LRR K, L)
Strat	tified Layers (A5)			.oamy Muo	ky Mineral (I	F1) <b>(LRR K,</b>	, L)	Polyvalue Below Surface (S8) (LRR K,
🔲 Depl	eted Below Dark S	Surface (A	A11) 🔲 I	oamy Gley	yed Matrix (F	2)		Thin Dark Surface (S9) <b>(LRR K, L)</b>
🔟 Thic	k Dark Surface (A	12)		Depleted M	latrix (F3)			Iron-Manganese Masses (F12) (LRR K, L
C Sand	dy Mucky Mineral (	(S1)		Redox Darl	< Surface (F6	<b>5</b> )		Piedmont Floodplain Soils (F19) <b>(MLRA 14</b>
C Sanc	ly Gleyed Matrix (	S4)		Depleted D	ark Surface (	(F7)		Mesic Spodic (TA6) <b>(MLRA 144A, 145, 149</b>
C Sanc	ly Redox (S5)			Redox Dep	ressions (F8)	)		Red Parent Material (F21)
ndicators	of hydrophytic veg	etation an	d wetland hyd	rology mus	t be present,	unless distur	bed or	Very Shallow Dark Surface (TF12)
oblematic								Other (Explain in Remarks)
Restricti	ve Layer (if obse	erved):						
Type:								Hydric Soil Present? Yes 🖄 No 🗌
								Hydric Soil Present? Yes 🛛 No 🗌
Depth (in	ches):	woont U	udvic coil indi	ator Thield			atiofied	Hydric Soil Present? Yes 🛛 No 🗌
Depth (in Remarks:	ches): Hydric soils are p	oresent. H	ydric soil indi	ator Thick	Dark Surfac	e (A12) is sa	atisfied.	Hydric Soil Present? Yes 🛛 No 🗌
Depth (in Remarks: <b>DROL</b>	ches): Hydric soils are p .OGY		ydric soil indi	ator Thick	Dark Surfac	e (A12) is sa	atisfied.	Hydric Soil Present? Yes 🛛 No 🗌
Depth (in Remarks: <b>DROL</b> Wetland	ches): Hydric soils are p .OGY Hydrology India	cators:				e (A12) is sa	atisfied.	
Depth (in Remarks: <b>DROL</b> Wetland Primary In	ches): Hydric soils are p .OGY Hydrology Indie ndicators (minimur	cators:		eck all that	apply)		atisfied.	Secondary Indicators (minimum of two require
Depth (in Remarks: <b>DROL</b> Wetland Primary In Sur	ches): Hydric soils are p .OGY Hydrology India ndicators (minimur face Water (A1)	<b>cators:</b> m of one i		eck all that	: apply) er-Stained Lea	aves (B9)	atisfied.	Secondary Indicators (minimum of two require
Depth (in Remarks: <b>DROL</b> Wetland Primary In D Sur L Hig	ches): Hydric soils are p OGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2	<b>cators:</b> m of one i	s required; ch	eck all that Wate Aqua	<u>: apply)</u> er-Stained Lea itic Fauna (B1	aves (B9) 13)	atisfied.	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10)
Depth (in Remarks: <b>DROL</b> Wetland Primary In D Sur L Hig	ches): Hydric soils are p .OGY Hydrology India ndicators (minimur face Water (A1)	<b>cators:</b> m of one i	s required; ch	eck all that Wate Aqua	: apply) er-Stained Lea	aves (B9) 13)	atisfied.	Secondary Indicators (minimum of two require
Depth (in Remarks: <b>7 DROL</b> Wetland Primary II Sur Hig Sati	ches): Hydric soils are p OGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2	<b>cators:</b> m of one i	s required; ch	eck all that	<u>: apply)</u> er-Stained Lea itic Fauna (B1	aves (B9) 13) 5)	atisfied.	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10)
Depth (in Remarks: <b>DROL</b> Wetland Primary In Sur Hig Sat Wa	ches): Hydric soils are p .OGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2 uration (A3)	cators: m of one i	s required; ch	eck all that Wate Aqua Marl Hydr	<u>apply)</u> er-Stained Lea tic Fauna (B1 Deposits (B1 ogen Sulfide	aves (B9) 13) 5) Odor (C1)	atisfied.	Secondary Indicators (minimum of two requires Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16)
Depth (in Remarks: <b>/DROL</b> Wetland Primary II Sur Hig Sat Wa Sed	ches): Hydric soils are p OGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1)	cators: m of one i	s required; ch	eck all that	<u>apply)</u> er-Stained Lea tic Fauna (B1 Deposits (B1 ogen Sulfide	aves (B9) 13) 5) Odor (C1) neres on Livir	ng Roots (C3)	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8)
Depth (in Remarks: DROL DROL Primary II D Sur Hig D Sat D Sat D Sed D Drif	ches): Hydric soils are p OGY Hydrology Indie ndicators (minimur face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B	cators: m of one i ) 2)	s required; ch	eck all that	<u>apply)</u> er-Stained Lea tic Fauna (B1 Deposits (B1 ogen Sulfide ized Rhizosph	aves (B9) 13) 5) Odor (C1) neres on Livir ced Iron (C4	ng Roots (C3)	Secondary Indicators (minimum of two require 
Depth (in Remarks: <b>/DROL</b> Wetland Primary In Sur Hig Sat Sat Sat Sat Sat Sat	ches): Hydric soils are p .OGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B3)	cators: m of one i ) 2)	s required; ch	eck all that Wate Aqua Marl Hydr Oxidi Prese	<u>apply)</u> er-Stained Lea tic Fauna (B1 Deposits (B1 ogen Sulfide ized Rhizosph ence of Redu	aves (B9) 13) 5) Odor (C1) neres on Livir ced Iron (C4 ction in Tilled	ng Roots (C3)	Secondary Indicators (minimum of two requires 
Depth (in Remarks: <b>/DROL</b> Wetland Primary II 	ches): Hydric soils are p OGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B1) iment Deposits (B3) al Mat or Crust (B4 n Deposits (B5)	<b>cators:</b> m of one i ) 2) 4)	is required; ch	eck all that Wate Aqua Marl Hydr Oxidi Prese Rece	<u>apply)</u> er-Stained Lea tic Fauna (B1 Deposits (B1 ogen Sulfide ized Rhizosph ence of Redu ent Iron Redu	aves (B9) 13) 5) Odor (C1) neres on Livir ced Iron (C4 ction in Tilled e (C7)	ng Roots (C3)	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1)
Depth (in Remarks: TDROL Uetland Primary I D Sur D Sur D Sur Sat D Sur	ches): Hydric soils are p .OGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on	cators: <u>m of one i</u> ) 2) 4) Aerial Ima	<u>is required; ch</u> agery(B7)	eck all that Wate Aqua Marl Hydr Oxidi Prese Rece	<u>apply)</u> er-Stained Lea dic Fauna (B1 Deposits (B1 ogen Sulfide ized Rhizosph ence of Reduc nt Iron Reduc Muck Surface	aves (B9) 13) 5) Odor (C1) neres on Livir ced Iron (C4 ction in Tilled e (C7)	ng Roots (C3)	Secondary Indicators (minimum of two require 
Depth (in Remarks: TDROL Uetland Primary I D Sur D Sur D Sur Sat D Sur	ches): Hydric soils are p OGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B1) iment Deposits (B3) al Mat or Crust (B4 n Deposits (B5)	cators: <u>m of one i</u> ) 2) 4) Aerial Ima	<u>is required; ch</u> agery(B7)	eck all that Wate Aqua Marl Hydr Oxidi Prese Rece	<u>apply)</u> er-Stained Lea dic Fauna (B1 Deposits (B1 ogen Sulfide ized Rhizosph ence of Reduc nt Iron Reduc Muck Surface	aves (B9) 13) 5) Odor (C1) neres on Livir ced Iron (C4 ction in Tilled e (C7)	ng Roots (C3)	Secondary Indicators (minimum of two require 
Depth (in Remarks: <b>/DROL</b> Wetland Primary II 	ches): Hydric soils are p .OGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on arsely Vegetated Ca	cators: <u>m of one i</u> ) 2) 4) Aerial Ima	<u>is required; ch</u> agery(B7)	eck all that Wate Aqua Marl Hydr Oxidi Prese Rece	<u>apply)</u> er-Stained Lea dic Fauna (B1 Deposits (B1 ogen Sulfide ized Rhizosph ence of Reduc nt Iron Reduc Muck Surface	aves (B9) 13) 5) Odor (C1) neres on Livir ced Iron (C4 ction in Tilled e (C7)	ng Roots (C3)	Secondary Indicators (minimum of two required Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3)
Primary In Primary In Primary In Sur	ches): Hydric soils are p .OGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4 n Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on arsely Vegetated Ca servations:	cators: m of one i ) 2) 4) Aerial Ima oncave Su	agery(B7) Irface (B8)	eck all that U Wate Aqua Aqua Aqua Aqua Aqua Aqua Aqua Aqua	<u>apply</u> er-Stained Lea atic Fauna (B1 Deposits (B1 ogen Sulfide ized Rhizosph ence of Reduc nt Iron Reduc Muck Surface r (Explain in 1	aves (B9) 13) 5) Odor (C1) neres on Livir ced Iron (C4 ction in Tilleo e (C7) Remarks)	ng Roots (C3)	Secondary Indicators (minimum of two require 
Depth (in Remarks: <b>/DROL</b> Wetland Primary II 	ches): Hydric soils are p .OGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on arsely Vegetated Co servations: Vater Present?	cators: m of one i ) 2) 4) Aerial Ima oncave Su Yee	agery(B7) Inface (B8)	eck all that Uate Aqua Aqua Aqua Aqua Aqua Aqua Aqua Aqua	apply) er-Stained Lea tic Fauna (B1 Deposits (B1 ogen Sulfide ized Rhizosph ence of Reduc nt Iron Reduc Muck Surface r (Explain in 1 Depth (inches	aves (B9) 13) 5) Odor (C1) neres on Livir ced Iron (C4 ction in Tilled e (C7) Remarks)	ng Roots (C3)	Secondary Indicators (minimum of two required)         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Saturation Visible on Aerial Imagery (C9)         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)         Shallow Aquitard (D3)         FAC-Neutral Test (D5)         Microtopographic Relief (D4)
Depth (in Remarks: <b>/DROL</b> Wetland Primary In Sur Hig Sat Wa' Sat Uai Sat Uai Sat Inu Spa Field Ob Surface V Water Ta	ches): Hydric soils are p .OGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on arsely Vegetated Ca servations: Vater Present? ble Present?	cators: m of one i ) 2) 4) Aerial Ima oncave Su Yee Yee	is required; ch agery(B7) Irface (B8) s 🗌 No s 🗌 No	eck all that U Wate Aqua Aqua Aqua Aqua Aqua Aqua Aqua Aqua	<u>apply</u> er-Stained Lea tic Fauna (B1 Deposits (B1 ogen Sulfide ized Rhizosph ence of Reduc mt Iron Reduc Muck Surface r (Explain in I Depth (inches Depth (inches	aves (B9) 13) 5) Odor (C1) neres on Livir ced Iron (C4 ction in Tilled e (C7) Remarks) s):	ng Roots (C3)	Secondary Indicators (minimum of two required
Depth (in Remarks: <b>DROL</b> Wetland Primary In Sur Hig Sat Nai Sat Nai Sed Iror Inu Spa Field Ob Surface W Water Tal Saturation	ches): Hydric soils are p .OGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on arsely Vegetated Co servations: Vater Present?	cators: m of one i ) 2) 4) Aerial Ima oncave Su Yee Yee	agery(B7) Inface (B8)	eck all that U Wate Aqua Aqua Aqua Aqua Aqua Aqua Aqua Aqua	apply) er-Stained Lea tic Fauna (B1 Deposits (B1 ogen Sulfide ized Rhizosph ence of Reduc nt Iron Reduc Muck Surface r (Explain in 1 Depth (inches	aves (B9) 13) 5) Odor (C1) neres on Livir ced Iron (C4 ction in Tilled e (C7) Remarks) s):	ng Roots (C3)	Secondary Indicators (minimum of two required
Depth (in Remarks: <b>/DROL</b> Wetland Primary II 	ches): Hydric soils are p .OGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on ursely Vegetated Ca servations: Vater Present? ble Present? n Present?	cators: m of one i ) 2) 4) Aerial Ima oncave Su Yee Yee Yee	is required; ch agery(B7) Irface (B8) s	eck all that U Wate Aqua Aqua Aqua Aqua Aqua Aqua Aqua Aqua	<u>apply</u> er-Stained Lea ttic Fauna (B1 Deposits (B1 ogen Sulfide ized Rhizosph ence of Reduc mt Iron Reduc Muck Surface r (Explain in I Depth (inches Depth (inches	aves (B9) 13) 5) Odor (C1) neres on Livir ced Iron (C4 ction in Tilled e (C7) Remarks) 5): 5): 5):	ng Roots (C3) ) d Soils (C6)	Secondary Indicators (minimum of two required         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Saturation Visible on Aerial Imagery (C9)         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)         Shallow Aquitard (D3)         FAC-Neutral Test (D5)         Microtopographic Relief (D4)         Indicators of         Wetland Hydrology Present?         Yes_N_NO_
Depth (in Remarks: <b>DROL</b> Wetland Primary Iu 	ches): Hydric soils are p .OGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4) n Deposits (B3) al Mat or Crust (B4) n Deposits (B5) ndation Visible on arsely Vegetated Co servations: Vater Present? ble Present? capillary fringe)	cators: m of one i ) 2) Aerial Ima oncave Su Yes Yes Yes	agery(B7) Irface (B8) s	eck all that Wate Aqua Marl Marl Oxidi Prese Rece Thin Othe	<u>apply</u> er-Stained Lea ttic Fauna (B1 Deposits (B1 ogen Sulfide ized Rhizosph ence of Reduc mt Iron Reduc Muck Surface r (Explain in I Depth (inches Depth (inches	aves (B9) 13) 5) Odor (C1) neres on Livir ced Iron (C4 ction in Tilled e (C7) Remarks) 5): 5): 5):	ng Roots (C3) ) d Soils (C6)	Secondary Indicators (minimum of two requires         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Saturation Visible on Aerial Imagery (C9)         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)         Shallow Aquitard (D3)         FAC-Neutral Test (D5)         Microtopographic Relief (D4)         Indicators of         Wetland Hydrology Present?         Yes_N_NO_



Photo 17. Wetland 4. Data points 6 through 9. View to the east.
Project/Site: Crystal Airport (MIC) Airfield Improvements	City/County: <u>Hennepin</u> Sampling Date: <u>June 5, 2018</u>						
Applicant/Owner: Metropolitan Airports Commission	State: Minnesota Sample Point: DP 8 upland						
Investigator(s): Brauna Hartzell and Kim Shannon, Mead & Hunt, Inc.	Section, Township, Range: <u>S33, T119N, R21W</u>						
Landform (hillslope, terrace, etc.): basin edge Local relief	f (concave, convex, none): <u>none</u> Slope (%): <u>&lt;1%</u>						
Subregion (LRR or MLRA): K/155 Lat: 45.069003	Long: <u>-93.35299</u> Datum: WGS84						
Soil Map Unit Name: Seelyeville and Markey soils, depressional, 0 to 1 percent slopes (D30A) NWI classification:							
Are climatic hydrologic conditions on the site typical for this time of year?	Yes 🔲 No 🔟 (If no, explain in Remarks.)						
Are Vegetation _ 🛛 _, Soil _ 🖂 _, or Hydrology _ 🔀 significantly distur	rbed? Are "Normal Circumstances" present? Yes No						
Are Vegetation, Soil, or Hydrology naturally problem	atic? (If needed, explain any answers in Remarks.)						
SUMMARY OF FINDINGS - Attach site map showing sampl	ing point locations, transects, important features, etc.						
Hydrophytic Vegetation Present? Yes 🗌 No 🖂	Is the Sampled Area						
Hydric Soil Present? Yes 🛛 No 🗌	within a Wetland? Yes No						
Wetland Hydrology Present? Yes 🗌 No 🖂	If yes, optional Wetland Side ID:						

Remarks: (Explain alternative procedures here or in a separate report.) A WETS analysis of the antecedent precipitation indicates the hydrologic conditions on the site were drier than normal at the time of investigation. Area mown regularly; hydrologic alterations to surrounding area including construction of fence with berm on east and road embankment to north.

#### **VEGETATION - Use scientific names of plants**

	Absolute	Dominant	Indicator	<b>50/20 Thresholds</b> 20% 50%
Tree Stratum (Plot size: )	% Cover	Species?	Status	Tree Stratum
1.				Sapling/Shrub Stratum
2.				Herb Stratum <u>20</u> <u>50</u>
3.				Woody Vine Stratum
4.				Dominance Test worksheet:
				Number of Dominant Species
5.		<b>T</b> 0		That Are OBL, FACW, or FAC: <u>1</u> (A)
		= Total Cov	rer	Total Number of Dominant
Sapling/Shrub Stratum (Plot size:)				Species Across All Strata: <u>3</u> (B)
1.				Percent of Dominant Species
2.				That Are OBI, FACW, or FAC: <u>33</u> (A/B)
3.				Prevalence Index worksheet:
4.	_			Total % Cover of. Multiply by:
5.	_			OBL species x 1 =
		= Total Cov	rer	FACW species x 2 =
Herb Stratum (Plot size: <u>5 ft.</u> )		-		FAC species x 2 =
1. Poa pratensis	40	Х	FACU	FACU species x 4 =
2. Bromus inermis	25	Х	FACU	UPL species $x =$
3. Persicaria hydropiper	20	Х	OBL	Column Totals: (A) (B)
4. Plantago major	10		FACU	Prevalence Index = $B/A = $ (B)
5. Taraxacum officinale	5		FACU	
6.				Hydrophytic Vegetation Indicators:
7.				Rapid Test for Hydrophytic Vegetation
8.				Dominance Test is >50%
9.				Prevalence Index is $\leq 3.0^1$
10.				Morphological Adaptations' (Provide supporting
11.				data in Remarks or on a separate sheet)
12.	_			Problematic Hydrophytic Vegetation' (Explain)
	100	= Total Cov	er	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be
Woody Vine Stratum (Plot size:)				present, unless disturbed or problematic.
1.				Definitions of Vegetation Strata:
2.				<b>Tree</b> – Woody plants 3 in. (7.6 cm) or more in diameter at
		= Total Cov	or	breast height (DBH), regardless of height.
Remarks: (Include photo numbers here or on a separat	o choot ) Ц		-	<b>Sapling/shrub</b> – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
		• •	-	Herb – All herbaceous (non-woody) plants, regardless of size,
not present. Sampling point is slightly higher on slop	e than wetla	ind sampling	) point DP7.	and woody plants less than 3.28 ft tall.
				Woody vines – All woody vines greater than 3.28 ft in height.
				Hydrophytic Vegetation Present?
				Yes 🗆 No 🕅

pth	Matrix			Redox Fe	atures			
iches)	Color (moist)	%	Color (mois	t) %	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-20	2.5/N	100					loam	
	Concentration D	Doplation	DM Deduce	Matrix CC	Covered a	Costod Con	d Cuping	2 continue DL David Lining M. Materia
	Concentration, D=	Depletion		I Maurix, CS		Coaled Sall	u Grains.	<sup>2</sup> Location: PL=Pore Lining, M=Matrix. Indicators for Problematic Hydric
Histo				Stripped Mai	triv (SG)			2 cm Muck - (A10) (LRR K, L, MLRA 149
							400)	
	c Epipedon (A2)					R, MLRA 1	-	Coast Prairie Redox (A16) (LRR K, L,
	k Histic (A3)						MLRA 149 E	
	rogen Sulfide (A4)					(LRR R, ML	-	Dark Surface (S7) (LRR K, L)
	tified Layers (A5)			.oamy Muck	xy Mineral (F	<sup>1</sup> ) (LRR K,	L)	Polyvalue Below Surface (S8) (LRR K,
Depl	leted Below Dark S	Surface (A	A11) 🔲 L	oamy Gleye	ed Matrix (F	2)		Thin Dark Surface (S9) (LRR K, L)
🔼 Thicl	k Dark Surface (A	12)	<u> </u>	Depleted Ma	atrix (F3)			Iron-Manganese Masses (F12) (LRR K, L
C Sand	dy Mucky Mineral	(S1)	F	Redox Dark	Surface (F6	)		Piedmont Floodplain Soils (F19) (MLRA 14
Sand	dy Gleyed Matrix (	S4)		Depleted Da	rk Surface (	F7)		Mesic Spodic (TA6) <b>(MLRA 144A, 145, 149</b>
Sand	dy Redox (S5)		<u> </u>	Redox Depre	essions (F8)			Red Parent Material (F21)
ndicators	of hydrophytic veg	etation an	d wetland hyd	rology must	be present,	unless disturb	oed or	Very Shallow Dark Surface (TF12)
oblematic			,	5,	. ,			Other (Explain in Remarks)
Restricti	ive Layer (if obs	erved):						
Type:		-						Hydric Soil Present? Yes 🖂 No 🗌
	iches):							
sepan (iii								
	,					· · · · · · · · · · · · · · · · · · ·	6 I	
	: Hydric soil is pre	sent. Hydi	ric soils indica	tor Thick Da	ark Surface	(A12) is satis	sfied. Within	mapped hydric soil association.
'DROL	Hydric soil is pre		ric soils indica	tor Thick Da	ark Surface	(A12) is satis	sfied. Within	mapped hydric soil association.
DROL Wetland	: Hydric soil is pre OGY I Hydrology Indi	cators:				(A12) is satis	sfied. Within	
DROL Wetland	: Hydric soil is pre .OGY I Hydrology Indi ndicators (minimu	cators:		eck all that a	apply)		sfied. Within	Secondary Indicators (minimum of two require
DROL Wetland	: Hydric soil is pre OGY I Hydrology Indi	cators:		eck all that a			sfied. Within	Secondary Indicators (minimum of two require
<b>DROL</b> Wetland Primary In D Surl Higl	Hydric soil is pre- OGY Hydrology Indi- ndicators (minimur face Water (A1) h Water Table (A2	cators: m of one i	s required; ch	eck all that a	apply) -Stained Lea ic Fauna (B1	aves (B9) 3)	sfied. Within	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10)
<b>DROL</b> Wetland Primary In D Surl Higl	Hydric soil is pre- OGY Hydrology Indi ndicators (minimu face Water (A1)	cators: m of one i	s required; ch	eck all that a	apply) -Stained Lea	aves (B9) 3)	sfied. Within	Secondary Indicators (minimum of two require
Vetland Primary Ir Surf Higl Satu	Hydric soil is pre- OGY Hydrology Indi- ndicators (minimur face Water (A1) h Water Table (A2	cators: m of one i	s required; ch	eck all that a	apply) -Stained Lea ic Fauna (B1	aves (B9) 3) 5)	sfied. Within	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10)
Vetland Primary Ir Comparison Primary In Comparison Primary In Pri	Hydric soil is pre- OGY Hydrology Indi- ndicators (minimu face Water (A1) h Water Table (A2 uration (A3)	<b>cators:</b> m of one i	s required; ch	eck all that a	apply) -Stained Lea ic Fauna (B1 Deposits (B1) gen Sulfide	aves (B9) 3) 5) Odor (C1)	g Roots (C3)	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2)
Primary Ir 	Hydric soil is pre- OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B	<b>cators:</b> m of one i	s required; ch	eck all that a Water Aquat Marl D Hydro Oxidiz	apply) -Stained Lea ic Fauna (B1 Deposits (B1! gen Sulfide ed Rhizosph	aves (B9) 3) 5) Odor (C1) eres on Livin	g Roots (C3)	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8)
Vetland Primary In Suri Higi Satu Satu Sed Drif	Hydric soil is pre- OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B ft Deposits (B3)	<b>cators:</b> m of one i	s required; ch	eck all that a	apply) -Stained Lea ic Fauna (B1 Deposits (B1 gen Sulfide ed Rhizosph nce of Reduc	aves (B9) 3) 5) Odor (C1) eres on Livin ced Iron (C4)	g Roots (C3)	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9)
Vetland Primary Ir Surf Guidentee Primary Ir Surf Guidentee Surf Surf Guidentee Surf Surf Surf Surf Surf Surf Surf Surf	Hydric soil is pre- OGY Hydrology Indi- ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B ft Deposits (B3) al Mat or Crust (B4	<b>cators:</b> m of one i	s required; ch	eck all that a	apply) -Stained Lea ic Fauna (B1 Deposits (B1 gen Sulfide ed Rhizosph nce of Reduc t Iron Reduc	aves (B9) 3) 5) Odor (C1) eres on Livin ced Iron (C4) ction in Tilled	g Roots (C3)	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1)
Vetland Primary Ir Suri Higi Satu Sed Sed Sed Sed Infi	Hydric soil is pre- OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B5)	cators: m of one i ) 2) 4)	<u>s required; ch</u>	eck all that a	apply) -Stained Lea ic Fauna (B1 Deposits (B1 gen Sulfide ed Rhizosph nce of Reduc t Iron Reduc fuck Surface	aves (B9) 3) 5) Odor (C1) eres on Livin ced Iron (C4) ction in Tilled e (C7)	g Roots (C3)	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2)
Vetland Primary In Suri Suri Satu Satu Sed Drif Alga Iror Inu	Hydric soil is pre- OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) undation Visible on	<b>cators:</b> <u>m of one i</u> 2) 2) 4) Aerial Ima	<u>s required; ch</u>	eck all that a	apply) -Stained Lea ic Fauna (B1 Deposits (B1 gen Sulfide ed Rhizosph nce of Reduc t Iron Reduc	aves (B9) 3) 5) Odor (C1) eres on Livin ced Iron (C4) ction in Tilled e (C7)	g Roots (C3)	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3)
Vetland Primary In Suri Suri Satu Satu Sed Drif Alga Iror Inu	Hydric soil is pre- OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B5)	<b>cators:</b> <u>m of one i</u> 2) 2) 4) Aerial Ima	<u>s required; ch</u>	eck all that a	apply) -Stained Lea ic Fauna (B1 Deposits (B1 gen Sulfide ed Rhizosph nce of Reduc t Iron Reduc fuck Surface	aves (B9) 3) 5) Odor (C1) eres on Livin ced Iron (C4) ction in Tilled e (C7)	g Roots (C3)	Secondary Indicators (minimum of two require 
Vetland Primary Ir Surf Surf Satu Satu Satu Satu Satu Inor Inor Spa	Hydric soil is pre- OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) indation Visible on arsely Vegetated C	<b>cators:</b> <u>m of one i</u> 2) 2) 4) Aerial Ima	<u>s required; ch</u>	eck all that a	apply) -Stained Lea ic Fauna (B1 Deposits (B1 gen Sulfide ed Rhizosph nce of Reduc t Iron Reduc fuck Surface	aves (B9) 3) 5) Odor (C1) eres on Livin ced Iron (C4) ction in Tilled e (C7)	g Roots (C3)	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3)
Vetland Primary Ir Surl Higl Satu Satu Sed Drif Alga Iror Inuu Spa	Hydric soil is pre- OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) undation Visible on arsely Vegetated Co servations:	<b>cators:</b> <u>m of one i</u> 2) 2) 4) Aerial Ima oncave Su	agery(B7)	eck all that a	apply) -Stained Lea ic Fauna (B1 Deposits (B1) gen Sulfide ed Rhizosph nce of Reduc t Iron Reduc fuck Surface (Explain in F	aves (B9) 3) 5) Odor (C1) eres on Livin ced Iron (C4) ction in Tilled c (C7) Remarks)	g Roots (C3)	Secondary Indicators (minimum of two require
Vetland         Primary Ir	Hydric soil is pre- OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) indation Visible on arsely Vegetated Co servations: Vater Present?	<b>cators:</b> <u>m of one i</u> 2) 2) 4) Aerial Ima oncave Su Yes	is required; ch	eck all that a	apply) -Stained Lea ic Fauna (B1 Deposits (B1 gen Sulfide ed Rhizosph nce of Reduc t Iron Reduc fuck Surface (Explain in R	aves (B9) 3) 5) Odor (C1) eres on Livin ced Iron (C4) ction in Tilled c (C7) Remarks)	g Roots (C3)	Secondary Indicators (minimum of two requires
Vetland Primary Ir Surf Surf Surf Surf Surface W Water Tal	Hydric soil is pre- OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) indation Visible on arsely Vegetated Co servations: Vater Present?	cators: m of one i 2) 2) 4) Aerial Ima oncave Su Yee Yee	is required; ch	eck all that a	apply) -Stained Lea ic Fauna (B1 Deposits (B1) gen Sulfide ed Rhizosph nce of Reduc t Iron Reduc t Iron Reduc (Explain in I (Explain in I epth (inches epth (inches	aves (B9) 3) 5) Odor (C1) eres on Livin ced Iron (C4) ction in Tilled c (C7) Remarks) c):	g Roots (C3)	Secondary Indicators (minimum of two requires Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3) FAC-Neutral Test (D5) Microtopographic Relief (D4) Indicators of Wetland Hydrology Present?
Vetland Primary Ir Surf Surf Satur Satur Surface W Water Tal Saturation	Hydric soil is pre- OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) undation Visible on arsely Vegetated Co servations: Vater Present? ble Present? n Present?	cators: m of one i 2) 2) 4) Aerial Ima oncave Su Yee Yee	is required; ch	eck all that a	apply) -Stained Lea ic Fauna (B1 Deposits (B1 gen Sulfide ed Rhizosph nce of Reduc t Iron Reduc fuck Surface (Explain in R	aves (B9) 3) 5) Odor (C1) eres on Livin ced Iron (C4) ction in Tilled c (C7) Remarks) c):	g Roots (C3)	Secondary Indicators (minimum of two required         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Saturation Visible on Aerial Imagery (C9)         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)         Shallow Aquitard (D3)         FAC-Neutral Test (D5)         Microtopographic Relief (D4)
Vetland Primary Ir Surf Surf Surf Surface W Water Tal Saturatior (includes)	Hydric soil is pre- OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) andation Visible on arsely Vegetated Co servations: Vater Present? ble Present? n Present? capillary fringe)	cators: m of one i m of one i 2) 2) 2) 4) Aerial Ima oncave Su Yee Yee Yee	is required; ch	eck all that a	apply) -Stained Lea ic Fauna (B1 Deposits (B1) gen Sulfide ed Rhizosph nce of Reduc t Iron Reduc t Iron Reduc (Explain in R (Explain in R epth (inches epth (inches	aves (B9) 3) 5) Odor (C1) eres on Livin ced Iron (C4) ction in Tilled c (C7) Remarks) c): c):	g Roots (C3) Soils (C6)	Secondary Indicators (minimum of two requires
Vetland Primary In Surf Surf Surf Surf Surface W Water Tal Saturation Cincludes Describe I	Hydric soil is pre- OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) undation Visible on arsely Vegetated Co servations: Vater Present? ble Present? n Present?	cators: m of one i m of one i 2) 2) 4) Aerial Ima oncave Su Yee Yee Yee Yee	is required; ch	eck all that a	apply) -Stained Lea ic Fauna (B1 Deposits (B1) gen Sulfide ed Rhizosph nce of Reduc t Iron Reduc t Iron Reduc (Explain in R (Explain in R epth (inches epth (inches	aves (B9) 3) 5) Odor (C1) eres on Livin ced Iron (C4) ction in Tilled c (C7) Remarks) c): c):	g Roots (C3) Soils (C6)	Secondary Indicators (minimum of two requires
Vetland Primary Ir Surf Satur Satur Sed Drif Alga Drif Alga Inor Spa Field Obs Surface W Water Tal Saturation Cincludes Describe I Saturation	Hydric soil is pre- OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) indation Visible on arsely Vegetated Co servations: Vater Present? ble Present? n Present? capillary fringe) Recorded Data (st n visible on 2018	cators: m of one i 2) 2) 4) Aerial Ima oncave Su Yes Yes Yes Yes	is required; ch	eck all that a	apply) -Stained Lea ic Fauna (B1 Deposits (B1) gen Sulfide ed Rhizosph nce of Reduc t Iron Reduc fuck Surface (Explain in R epth (inches epth (inches epth (inches pth (inches	aves (B9) 3) 5) Odor (C1) eres on Livin ced Iron (C4) ction in Tilled c (C7) Remarks) c): c): c): evious inspect	g Roots (C3) Soils (C6)	Secondary Indicators (minimum of two requires



Photo 17. Wetland 4. Data points 6 through 9. View to the east.

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Project/Site: Crystal Airport (MIC) Airfield Improvements	City/County: <u>Hennepin</u>	Sampling Date: June 5, 2018		
Applicant/Owner: Metropolitan Airports Commission	State: <u>Minnesota</u>	Sample Point: <u>DP9</u>		
Investigator(s): Brauna Hartzell and Kim Shannon, Mead & Hunt, Inc.	Section, Township, Range:	<u>S33, T119N, R21W</u>		
Landform (hillslope, terrace, etc.): footslope Local reli	ef (concave, convex, none): <u>convex</u>	Slope (%): <a></a>		
Subregion (LRR or MLRA): <u>K/155</u> Lat: <u>45.068977</u>	Long: -93.353081	Datum: WGS84		
Soil Map Unit Name: Seelyeville and Markey soils, depressional, 0 to 1 g	percent slopes (D30A) NWI classification	۲ <u> </u>		
Are climatic hydrologic conditions on the site typical for this time of year?	Yes 🔲 No 🗵 (If no, explain in Re	marks.)		
Are Vegetation, Soil, or Hydrology significantly dist	urbed? Are "Normal Circumstances" p	resent? Yes No		
Are Vegetation, Soil, or Hydrology naturally problem	matic? (If needed, explain any answe	rs in Remarks.)		
SUMMARY OF FINDINGS - Attach site map showing samp	oling point locations, transects, im	portant features, etc.		
Hydrophytic Vegetation Present? Yes 🗌 No 🖾	Is the Sampled Area			
Hydric Soil Present? Yes 🛛 No 🗌	within a Wetland?	/es No		
Wetland Hydrology Present? Yes Ves No X	If yes, optional Wetland Side ID:			

Remarks: (Explain alternative procedures here or in a separate report.) A WETS analysis of the antecedent precipitation indicates the hydrologic conditions on the site were drier than normal at the time of investigation. Area mown regularly; hydrologic alterations to surrounding area including construction of fence with berm on east and road embankment to north.

No 🖂

#### **VEGETATION - Use scientific names of plants**

Yes 🗌

Wetland Hydrology Present?

	Absolute	Dominant	Indicator	<b>50/20 Thresholds</b> 20% 50%
Tree Stratum (Plot size:)	% Cover	Species?	Status	Tree Stratum
1.				Sapling/Shrub Stratum
2.				Herb Stratum <u>20</u> <u>50</u>
3.				Woody Vine Stratum
4.				Dominance Test worksheet:
5.				Number of Dominant Species
5.		Tatal Ca		That Are OBL, FACW, or FAC: <u>0</u> (A)
Capling (Church Church und (Dist size)		= Total Cov	er	Total Number of Dominant
Sapling/Shrub Stratum (Plot size:)				Species Across All Strata: <u>1</u> (B)
1.				Percent of Dominant Species
2.				That Are OBI, FACW, or FAC: <u>0</u> (A/B)
3.				Prevalence Index worksheet:
4.				Total % Cover of. Multiply by:
5.	-			OBL species x 1 =
		= Total Cov	er	FACW species x 2 =
Herb Stratum (Plot size: <u>5 ft</u> )		-		FAC species x 3 =
1. Poa pratensis	70	Х	FACU	FACU species x 4 =
2. Persicaria hydropiper	10		OBL	UPL species         x +           VPL species         x 5 =
3. Stellaria meadia	7		FACU	Column Totals: (A) (B)
4. Plantago major	5		FACU	Prevalence Index = $B/A = $
5. Bromus inermis	5		UPL	Hydrophytic Vegetation Indicators:
6. Taraxacum officinale	3		FACU	
7.				Rapid Test for Hydrophytic Vegetation
8.				Dominance Test is >50%
9.				Prevalence Index is $\leq 3.0^1$
10.				Morphological Adaptations' (Provide supporting
11.				data in Remarks or on a separate sheet)
12.				Problematic Hydrophytic Vegetation' (Explain)
	100	= Total Cov	er	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be
Woody Vine Stratum (Plot size:)				present, unless disturbed or problematic.
1.				Definitions of Vegetation Strata:
2.				<b>Tree</b> – Woody plants 3 in. (7.6 cm) or more in diameter at
		= Total Cov	or	breast height (DBH), regardless of height.
Remarks: (Include photo numbers here or on a separate	choot ) U			Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
				<b>Herb</b> – All herbaceous (non-woody) plants, regardless of size,
not present. Data point is slightly higher on slope than	data points		P7 on	and woody plants less than 3.28 ft tall.
transect.				<b>Woody vines</b> – All woody vines greater than 3.28 ft in height.
				Hydrophytic Vegetation Present?

pth	Matrix			Redox Fe	eatures	1		
ches)	Color (moist)	%	Color (mois	it) %	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-20	2.5/N	100					loam	
vpe: C=	Concentration, D=	Depletion.	RM=Reduced	d Matrix, CS	=Covered o	r Coated San	d Grains.	<sup>2</sup> Location: PL=Pore Lining, M=Matrix.
	oil Indicators:	2 op octori,						Indicators for Problematic Hydric
÷	osol (A1)			Stripped Ma	trix (S6)			2 cm Muck - (A10) (LRR K, L, MLRA 14
	c Epipedon (A2)					R, MLRA 1	49B)	Coast Prairie Redox (A16) (LRR K, L,
	k Histic (A3)						MLRA 149 E	_
	rogen Sulfide (A4)					(LRR R, ML		Dark Surface (S7) (LRR K, L)
	tified Layers (A5)					=1) (LRR K,	-	Polyvalue Below Surface (S8) (LRR K,
	leted Below Dark S	Surface (A			ed Matrix (F		L)	Thin Dark Surface (S9) (LRR K, L)
				Depleted Ma		2)		
	k Dark Surface (Al					`		Iron-Manganese Masses (F12) (LRR K, L
	dy Mucky Mineral (				Surface (F6			
	dy Gleyed Matrix (	54)		•	ark Surface (			Mesic Spodic (TA6) (MLRA 144A, 145, 149
	ly Redox (S5)				essions (F8)			Red Parent Material (F21)
	of hydrophytic veg	etation and	d wetland hyd	rology must	be present,	unless disturt	oed or	Very Shallow Dark Surface (TF12)
oblematic								Other (Explain in Remarks)
Restricti	ve Layer (if obse	erved):						
ype:								Hydric Soil Present? Yes 🛛 No 🗌
Depth (in	ches):							
	Hydric soils are p	oresent. Hy	ydric soil indio	ator Thick	Dark Surfac	e (A12) is sa	tisfied.	
	Hydric soils are p	present. Hy	ydric soil india	cator Thick	Dark Surfac	e (A12) is sa	tisfied.	
Remarks:	Hydric soils are p		ydric soil indio	cator Thick	Dark Surfac	e (A12) is sa	tisfied.	
Remarks: DROL Wetland	Hydric soils are p	cators:	_			e (A12) is sa	tisfied.	Secondary Indicators (minimum of two require
Remarks: DROL Vetland Primary I	Hydric soils are p OGY	cators:	_	eck all that			tisfied.	
Remarks: <b>DROL</b> <b>Wetland</b> Primary In Sur	Hydric soils are p OGY Hydrology Indic ndicators (minimur face Water (A1)	cators: m of one is	s required; ch	eck all that	apply) -Stained Lea	aves (B9)	tisfied.	Surface Soil Cracks (B6)
Remarks:         DROL         Wetland         Primary In	Hydric soils are p OGY Hydrology Indic ndicators (minimur face Water (A1) h Water Table (A2)	cators: m of one is	s required; ch	eck all that Water Aquat	apply) Stained Lea ic Fauna (B1	aves (B9) 13)	tisfied.	Surface Soil Cracks (B6) Drainage Patterns (B10)
Remarks:         DROL         Wetland         Primary In	Hydric soils are p OGY Hydrology Indic ndicators (minimur face Water (A1) h Water Table (A2) uration (A3)	cators: m of one is	s required; ch	eck all that Water Aquat Marl [	apply) Stained Lea ic Fauna (B1 Deposits (B1	aves (B9) .3) 5)	tisfied.	<ul> <li> Surface Soil Cracks (B6)</li> <li> Drainage Patterns (B10)</li> <li> Moss Trim Lines (B16)</li> </ul>
Remarks:       DROL       Vetland       Primary In	Hydric soils are p OGY Hydrology Indic ndicators (minimur face Water (A1) h Water Table (A2) uration (A3) ter Marks (B1)	cators: n of one is	s required; ch	eck all that Water Aquat Marl I Hydrc	apply) Stained Lea ic Fauna (B1 Deposits (B1 ogen Sulfide	aves (B9) .3) 5) Odor (C1)		<ul> <li>Surface Soil Cracks (B6)</li> <li>Drainage Patterns (B10)</li> <li>Moss Trim Lines (B16)</li> <li>Dry-Season Water Table (C2)</li> </ul>
Remarks:         DROL         Wetland         Primary II	Hydric soils are p OGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2) uration (A3) ter Marks (B1) liment Deposits (B2)	cators: n of one is	s required; ch	eck all that Water Aquat Mari I Hydro	apply) Stained Lea ic Fauna (B1 Deposits (B1 Deposits (B1 Deposits can be conserved to the conserved to th	aves (B9) .3) 5) Odor (C1) ieres on Livin	ug Roots (C3)	<ul> <li>Surface Soil Cracks (B6)</li> <li>Drainage Patterns (B10)</li> <li>Moss Trim Lines (B16)</li> <li>Dry-Season Water Table (C2)</li> <li>Crayfish Burrows (C8)</li> </ul>
Remarks:         DROL         Vetland         Primary In	Hydric soils are p OGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2) uration (A3) ter Marks (B1) liment Deposits (B3)	cators: m of one is ) 2)	s required; ch	eck all that Water Aquat Marl I Hydro Oxidiz Prese	apply) Stained Lea ic Fauna (B1 Deposits (B1 Deposits (B1 ogen Sulfide red Rhizosph nce of Redu	aves (B9) .3) 5) Odor (C1) ieres on Livin ced Iron (C4)	ug Roots (C3)	<ul> <li>Surface Soil Cracks (B6)</li> <li>Drainage Patterns (B10)</li> <li>Moss Trim Lines (B16)</li> <li>Dry-Season Water Table (C2)</li> <li>Crayfish Burrows (C8)</li> <li>Saturation Visible on Aerial Imagery (C9)</li> </ul>
Remarks:         DROL         Vetland         Primary II	Hydric soils are p OGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2) uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4	cators: m of one is ) 2)	s required; ch	eck all that Water Aquat Marl I Hydro Oxidiz Prese	apply) Stained Lea ic Fauna (B1 Deposits (	aves (B9) 13) 5) Odor (C1) reres on Livin ced Iron (C4) ction in Tilled	ug Roots (C3)	<ul> <li>Surface Soil Cracks (B6)</li> <li>Drainage Patterns (B10)</li> <li>Moss Trim Lines (B16)</li> <li>Dry-Season Water Table (C2)</li> <li>Crayfish Burrows (C8)</li> <li>Saturation Visible on Aerial Imagery (C9</li> <li>Stunted or Stressed Plants (D1)</li> </ul>
Remarks:         DROL         Vetland         Primary II	Hydric soils are p OGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2) uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4 n Deposits (B5)	cators: <u>m of one is</u> ) 2)	s required; ch	eck all that Water Aquat Aquat Marl I Hydro Oxidiz Prese Recer Thin I	apply) Stained Lea ic Fauna (Bi Deposits (B1 ogen Sulfide red Rhizosph nce of Redu nt Iron Redu Muck Surface	aves (B9) 3) 5) Odor (C1) eres on Livin ced Iron (C4) ction in Tilled e (C7)	ug Roots (C3)	<ul> <li>Surface Soil Cracks (B6)</li> <li>Drainage Patterns (B10)</li> <li>Moss Trim Lines (B16)</li> <li>Dry-Season Water Table (C2)</li> <li>Crayfish Burrows (C8)</li> <li>Saturation Visible on Aerial Imagery (C9)</li> <li>Stunted or Stressed Plants (D1)</li> <li>Geomorphic Position (D2)</li> </ul>
Remarks:         DROL         Vetland         Primary In	Hydric soils are p OGY Hydrology India I Hydrology India I Hydrology India I Hydrology India I Hydrology India face Water (A1) h Water Table (A2) uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4) h Deposits (B5) ndation Visible on a	cators: <u>m of one is</u> ) 2) Aerial Ima	s required; ch	eck all that Water Aquat Aquat Marl I Hydro Oxidiz Prese Recer Thin I	apply) Stained Lea ic Fauna (B1 Deposits (	aves (B9) 3) 5) Odor (C1) eres on Livin ced Iron (C4) ction in Tilled e (C7)	ug Roots (C3)	<ul> <li>Surface Soil Cracks (B6)</li> <li>Drainage Patterns (B10)</li> <li>Moss Trim Lines (B16)</li> <li>Dry-Season Water Table (C2)</li> <li>Crayfish Burrows (C8)</li> <li>Saturation Visible on Aerial Imagery (C9)</li> <li>Stunted or Stressed Plants (D1)</li> <li>Geomorphic Position (D2)</li> <li>Shallow Aquitard (D3)</li> </ul>
Remarks:         DROL         Vetland         Primary In	Hydric soils are p OGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2) uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4 n Deposits (B5)	cators: <u>m of one is</u> ) 2) Aerial Ima	s required; ch	eck all that Water Aquat Aquat Marl I Hydro Oxidiz Prese Recer Thin I	apply) Stained Lea ic Fauna (Bi Deposits (B1 ogen Sulfide red Rhizosph nce of Redu nt Iron Redu Muck Surface	aves (B9) 3) 5) Odor (C1) eres on Livin ced Iron (C4) ction in Tilled e (C7)	ug Roots (C3)	<ul> <li>Surface Soil Cracks (B6)</li> <li>Drainage Patterns (B10)</li> <li>Moss Trim Lines (B16)</li> <li>Dry-Season Water Table (C2)</li> <li>Crayfish Burrows (C8)</li> <li>Saturation Visible on Aerial Imagery (C9)</li> <li>Stunted or Stressed Plants (D1)</li> <li>Geomorphic Position (D2)</li> <li>Shallow Aquitard (D3)</li> <li>FAC-Neutral Test (D5)</li> </ul>
Remarks:         DROL         Vetland         Primary II	Hydric soils are p OGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2) uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on a arsely Vegetated Co	cators: <u>m of one is</u> ) 2) Aerial Ima	s required; ch	eck all that Water Aquat Aquat Marl I Hydro Oxidiz Prese Recer Thin I	apply) Stained Lea ic Fauna (Bi Deposits (B1 ogen Sulfide red Rhizosph nce of Redu nt Iron Redu Muck Surface	aves (B9) 3) 5) Odor (C1) eres on Livin ced Iron (C4) ction in Tilled e (C7)	ug Roots (C3)	<ul> <li>Surface Soil Cracks (B6)</li> <li>Drainage Patterns (B10)</li> <li>Moss Trim Lines (B16)</li> <li>Dry-Season Water Table (C2)</li> <li>Crayfish Burrows (C8)</li> <li>Saturation Visible on Aerial Imagery (C9)</li> <li>Stunted or Stressed Plants (D1)</li> <li>Geomorphic Position (D2)</li> <li>Shallow Aquitard (D3)</li> </ul>
Remarks:         DROL         Vetland         Primary In	Hydric soils are p OGY Hydrology India I Hydrology India I Hydrology India I Hydrology India I Hydrology India face Water (A1) h Water Table (A2) uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4) h Deposits (B5) Indation Visible on A arsely Vegetated Co servations:	cators: <u>m of one is</u> ) 2) Aerial Ima oncave Su	s required; ch ngery(B7) rface (B8)	eck all that Water Aquat Hydro Oxidiz Prese Recer Thin I Other	apply) Stained Lea ic Fauna (B1 Deposits (B1 Deposits (B1 Deposits (B1 Deposits (B1 Deposits (B1 Muck Surface (Explain in 1	aves (B9) (3) Odor (C1) neres on Livin ced Iron (C4) ction in Tilled e (C7) Remarks)	ug Roots (C3)	<ul> <li>Surface Soil Cracks (B6)</li> <li>Drainage Patterns (B10)</li> <li>Moss Trim Lines (B16)</li> <li>Dry-Season Water Table (C2)</li> <li>Crayfish Burrows (C8)</li> <li>Saturation Visible on Aerial Imagery (C9)</li> <li>Stunted or Stressed Plants (D1)</li> <li>Geomorphic Position (D2)</li> <li>Shallow Aquitard (D3)</li> <li>FAC-Neutral Test (D5)</li> <li>Microtopographic Relief (D4)</li> </ul>
Remarks:         DROL         Vetland         Primary II         Sur         Hig         Sur         Hig         Satur         Satur         Satur         Satur         Satur         Satur         Inva         Inva         Spatial         Statur         Surface V	Hydric soils are p OGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2) uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on A arsely Vegetated Co servations: Vater Present?	cators: m of one is ) 2) Aerial Ima oncave Su Yes	s required; ch	eck all that Uater Aquat Aquat Aquat Array	apply) Stained Lea ic Fauna (B1 Deposits (B1 Deposits (B1 red Rhizosph nce of Reduce t Iron Reduce Muck Surface (Explain in land) epth (inchest	aves (B9) .3) 5) Odor (C1) meres on Livin ced Iron (C4) ction in Tilled e (C7) Remarks) 5):	ug Roots (C3)	<ul> <li>Surface Soil Cracks (B6)</li> <li>Drainage Patterns (B10)</li> <li>Moss Trim Lines (B16)</li> <li>Dry-Season Water Table (C2)</li> <li>Crayfish Burrows (C8)</li> <li>Saturation Visible on Aerial Imagery (C9)</li> <li>Stunted or Stressed Plants (D1)</li> <li>Geomorphic Position (D2)</li> <li>Shallow Aquitard (D3)</li> <li>FAC-Neutral Test (D5)</li> <li>Microtopographic Relief (D4)</li> </ul>
Remarks:         DROL         Vetland         Primary II         Sur         Hig         Sur         Hig         Sati         Inu         Spa         Surface V         Vater Tai	Hydric soils are p OGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2) uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on a arsely Vegetated Co servations: Vater Present? ble Present?	cators: <u>m of one is</u> ) 2) Aerial Ima oncave Su Yes Yes	s required; ch	eck all that U Water Aquat Aquat Hydrc Oxidiz Oxidiz Recer Thin I Other Other	apply) -Stained Lea ic Fauna (B1 Deposits (B1 Deposits (B1 red Rhizosph nce of Reduce the Iron Reduce Muck Surface (Explain in land) epth (inchest epth (inchest	aves (B9) (3) 5) Odor (C1) teres on Livin ced Iron (C4) ction in Tilled (C7) Remarks) (C7) Remarks)	ug Roots (C3)	Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3) FAC-Neutral Test (D5) Microtopographic Relief (D4) Indicators of Wetland Hydrology Present?
Remarks:         DROL         Primary II	Hydric soils are p OGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2) uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on arsely Vegetated Co servations: Vater Present? ble Present? n Present?	cators: <u>m of one is</u> ) 2) Aerial Ima oncave Su Yes Yes	s required; ch	eck all that U Water Aquat Aquat Hydrc Oxidiz Oxidiz Recer Thin I Other Other	apply) Stained Lea ic Fauna (B1 Deposits (B1 Deposits (B1 red Rhizosph nce of Reduce t Iron Reduce Muck Surface (Explain in land) epth (inchest	aves (B9) (3) 5) Odor (C1) teres on Livin ced Iron (C4) ction in Tilled (C7) Remarks) (C7) Remarks)	ug Roots (C3)	<ul> <li>Surface Soil Cracks (B6)</li> <li>Drainage Patterns (B10)</li> <li>Moss Trim Lines (B16)</li> <li>Dry-Season Water Table (C2)</li> <li>Crayfish Burrows (C8)</li> <li>Saturation Visible on Aerial Imagery (C9)</li> <li>Stunted or Stressed Plants (D1)</li> <li>Geomorphic Position (D2)</li> <li>Shallow Aquitard (D3)</li> <li>FAC-Neutral Test (D5)</li> <li>Microtopographic Relief (D4)</li> </ul>
Remarks:         DROL         Vetland         Primary II         Sur         Hig         Sur         Hig         Sati         Drif         Alga         Inu         Spa         Gurface V         Surface V         Vater Tal         Saturation         Includes	Hydric soils are p OGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2) uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on a arsely Vegetated Co servations: Vater Present? ble Present?	cators: <u>m of one is</u> ) 2) Aerial Ima oncave Su Yes Yes Yes	s required; ch	eck all that U Water Aquat Aquat Arr I Arr	apply) -Stained Lea ic Fauna (B1 Deposits (B1 Deposits (B1 red Rhizosph nce of Redur nt Iron Redur Muck Surface (Explain in l epth (inches epth (inches epth (inches	aves (B9) .3) 5) Odor (C1) teres on Livin ced Iron (C4) ction in Tilled e (C7) Remarks) 5): 5): 5):	g Roots (C3) ) I Soils (C6)	Surface Soil Cracks (B6)  Crainage Patterns (B10)  Moss Trim Lines (B16)  Crayfish Burrows (C8)  Saturation Visible on Aerial Imagery (C9)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  FAC-Neutral Test (D5)  Microtopographic Relief (D4)  Indicators of Wetland Hydrology Present? YesNo_X_
Remarks:         DROL         Vetland         Primary II         Sur         Hig         Sur         Hig         Sati         Drif         Alga         Inu         Spa         Gurface V         Surface V         Vater Tal         Saturation         Includes	Hydric soils are p OGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2) uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on a arsely Vegetated Co servations: Vater Present? ble Present? n Present? capillary fringe)	cators: <u>m of one is</u> ) 2) Aerial Ima oncave Su Yes Yes Yes	s required; ch	eck all that U Water Aquat Aquat Arr I Arr	apply) -Stained Lea ic Fauna (B1 Deposits (B1 Deposits (B1 red Rhizosph nce of Redur nt Iron Redur Muck Surface (Explain in l epth (inches epth (inches epth (inches	aves (B9) .3) 5) Odor (C1) teres on Livin ced Iron (C4) ction in Tilled e (C7) Remarks) 5): 5): 5):	g Roots (C3) ) I Soils (C6)	Surface Soil Cracks (B6)  Crainage Patterns (B10)  Moss Trim Lines (B16)  Crayfish Burrows (C8)  Saturation Visible on Aerial Imagery (C9)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  FAC-Neutral Test (D5)  Microtopographic Relief (D4)  Indicators of Wetland Hydrology Present? YesNo_X_
Remarks:         DROL         Vetland         Primary II	Hydric soils are p OGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2) uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4) n Deposits (B5) ndation Visible on a arsely Vegetated Co servations: Vater Present? ble Present? n Present? capillary fringe) Recorded Data (str	cators: m of one is ) 2) Aerial Ima oncave Su Yes Yes Yes	s required; ch	eck all that U Water Aquat Aquat Hydrc Oxidiz Prese Recer Thin I Other Other D D D D D D D , well, aeria	apply) Stained Lea ic Fauna (B1 Deposits (B1 Deposits (B1 red Rhizosph nce of Reduce the Iron Reduce Muck Surface (Explain in land) epth (inchession epth (inchession epth (inchession) al photos, pro-	aves (B9) .3) 5) Odor (C1) meres on Livin ced Iron (C4) ction in Tilled e (C7) Remarks) 5): s): s): evious inspect	g Roots (C3) ) I Soils (C6)	Surface Soil Cracks (B6)  Crainage Patterns (B10)  Moss Trim Lines (B16)  Crayfish Burrows (C8)  Saturation Visible on Aerial Imagery (C9)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  FAC-Neutral Test (D5)  Microtopographic Relief (D4)  Indicators of Wetland Hydrology Present? YesNo_X_



Photo 17. Wetland 4. Data points 6 through 9. View to the east.

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Project/Site: Crystal Airport (MIC) Airfield Improvements Applicant/Owner: Metropolitan Airports Commission				
Investigator(s): Brauna Hartzell and Kim Shannon, Mead				
Landform (hillslope, terrace, etc.): basin				
Subregion (LRR or MLRA): <u>K/155</u> Lat: <u>4</u>				
Soil Map Unit Name: <u>Seelyeville and Markey soils, depres</u>				
Are climatic hydrologic conditions on the site typical for th				
Are Vegetation, Soil, or Hydrologys	-			nal Circumstances" present? Yes No
Are Vegetation, Soil, or Hydrology r SUMMARY OF FINDINGS - Attach site map sh			•	d, explain any answers in Remarks.)
Hydrophytic Vegetation Present? Yes 🖂	No		Is the Sam	
				·
Hydric Soil Present? Yes			within a W	etland? YesNo
Wetland Hydrology Present? Yes 🛛	No		If yes, option	nal Wetland Side ID: <u>5</u>
	ime of inve	stigation. A		of the antecedent precipitation indicates the hydrologic ularly; hydrologic alterations to surrounding area including
<b>VEGETATION - Use scientific names of plants</b>				
	Absolute	Dominant	Indicator	<b>50/20 Thresholds</b> 20% 50%
Tree Stratum (Plot size:)	% Cover	Species?	Status	Tree Stratum
1.				Sapling/Shrub Stratum
2.				Herb Stratum <u>20</u> <u>50</u>
3.				Woody Vine Stratum
4.				Dominance Test worksheet:
5.				Number of Dominant Species
5.		= Total Co	Wor	That Are OBL, FACW, or FAC: $1$ (A)
Sapling/Shrub Stratum (Plot size:				Total Number of Dominant
Sapling/Shrub Stratum (Plot size:)				Species Across All Strata: <u>1</u> (B)
1. 2.				Percent of Dominant Species
				That Are OBI, FACW, or FAC: <u>100</u> (A/B)
3.				Prevalence Index worksheet:
4.				Total % Cover of. Multiply by:
5.		= Total Co		OBL species x 1 =
Lloub Churchurg (Dict sizes E ft.)			over	FACW species x 2 =
Herb Stratum (Plot size: <u>5 ft.</u> )	00	v		FAC species x 3 =
1. Persicaria hydropiper	90	Х	OBL	FACU species x 4 =
2. Eleocharis obtusa	3		OBL	UPL species x 5 =
3. Phalaris arundinacea	3		FACW	Column Totals: (A) (B)
4. Bromus inermis	4		FACU	Prevalence Index = B/A =
5.		-		Hydrophytic Vegetation Indicators:
6.				Rapid Test for Hydrophytic Vegetation
7.				Dominance Test is >50%
8.				$\_$ Prevalence Index is $\le 3.0^1$
9.				Morphological Adaptations' (Provide supporting
10.				data in Remarks or on a separate sheet)
11.				Problematic Hydrophytic Vegetation' (Explain)
12.				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be
	100	= Total Co	over	present, unless disturbed or problematic.
Woody Vine Stratum (Plot size:)				Definitions of Vegetation Strata:
1.				<b>Tree</b> – Woody plants 3 in. (7.6 cm) or more in diameter at
2.	-			breast height (DBH), regardless of height.
		= Total Co	over	Sapling/shrub – Woody plants less than 3 in. DBH and
Remarks: (Include photo numbers here or on a separate	, ,	. ,	5	greater than 3.28 ft (1 m) tall.
not present. Also, <i>Carex</i> sp. present within wetland. Daupland sampling point DP11.	ita point is 1	-2 feet low	er than paired	<ul> <li>Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.</li> <li>Woody vines – All woody vines greater than 3.28 ft in height.</li> </ul>
				Hydrophytic Vegetation Present?

No \_\_\_\_

Yes 🔤

SO	IL
----	----

epth	Matrix			Redox Fea				
nches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-12	2.5/N	100					Loam	
12-20	2.5/N	100					Loam	With undecomposed organic matter
ype: C=	Concentration, D=	Depletion, F	RM=Reduced	Matrix, CS=	Covered o	r Coated Sa	nd Grains.	<sup>2</sup> Location: PL=Pore Lining, M=Matrix.
Hydric S	<b>oil Indicators:</b> osol (A1)		Sti	ripped Mati	rix (S6)			Indicators for Problematic Hydric 2 cm Muck - (A10) (LRR K, L, MLRA 149
	ic Epipedon (A2)					R, MLRA	149B)	Coast Prairie Redox (A16) (LRR K, L,
	k Histic (A3)						, R, MLRA 149 I	
	rogen Sulfide (A4)	)					LRA 149B)	□ Dark Surface (S7) (LRR K, L)
	tified Layers (A5)	/				F1) (LRR K	_	Polyvalue Below Surface (S8) (LRR K,
	leted Below Dark S	Surface (A1		amy Gleye	•	<i>,</i> .	, <b>-</b> )	Thin Dark Surface (S9) (LRR K, L)
	k Dark Surface (A	•		pleted Mat		-)		☐ Iron-Manganese Masses (F12) (LRR K, L
	dy Mucky Mineral			dox Dark S		3		Piedmont Floodplain Soils (F19) (MLRA 14
	dy Gleyed Matrix (			pleted Dar				Mesic Spodic (TA6) (MLRA 144A, 145, 149
	dy Redox (S5)	(34)		dox Depre				Red Parent Material (F21)
							to day	
ndicators oblematic	of hydrophytic veg	jetation and	wetland hydro	logy must b	e present,	uniess distui	rbed or	Very Shallow Dark Surface (TF12)  Other (Europein in Demonder)
	 ive Layer (if obse						I	Other (Explain in Remarks)
Type:	 nches):							Hydric Soil Present? Yes 🛛 No 🗌
Deptil (III	iches).							
Remarks:	: Hydric soils are p	present; hyd	lric soil indica	tor Thick D	ark Surfac	e (A12) is s	atisfied. Data	point within mapped hydric soil.
Remarks:	: Hydric soils are p		dric soil indica	tor Thick D	ark Surfac	e (A12) is s	atisfied. Data	point within mapped hydric soil.
Remarks: DROL Wetland	: Hydric soils are p	cators:				e (A12) is s	atisfied. Data	point within mapped hydric soil. Secondary Indicators (minimum of two require
Remarks: <b>DROL</b> Wetland Primary I	Hydric soils are p OGY Hydrology Indiandicators (minimum	cators:	required; chea	k all that a	pply)		atisfied. Data	Secondary Indicators (minimum of two require
Remarks: <b>DROL</b> Wetland Primary I Sur	Hydric soils are p OGY Hydrology Indian ndicators (minimu face Water (A1)	cators: m of one is	required; chea	k all that a	pply) Stained Lea	aves (B9)	atisfied. Data	Secondary Indicators (minimum of two require
Remarks: <b>DROL</b> Wetland Primary I Sur Hig	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2	cators: m of one is	required; chea	k all that a Water-: Aquatic	pply) Stained Lea : Fauna (B1	aves (B9) 13)	atisfied. Data	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10)
Remarks: DROL Vetland Primary I Sur Hig Sat	Hydric soils are p OGY Hydrology India Indicators (minimum face Water (A1) h Water Table (A2 curation (A3)	cators: m of one is	required; chea   	k all that a Water-: Aquatic Marl De	pply) Stained Lea Fauna (B1 eposits (B1	aves (B9) 13) 5)	atisfied. Data	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16)
Remarks: <b>DROL Wetland</b> Primary I	Hydric soils are p OGY Hydrology Indian I Hydrology India Indicators (minimu face Water (A1) In Water Table (A2 Suration (A3) Iter Marks (B1)	icators: m of one is 2)	required; chea   	k all that a Water- Aquatic Marl De Hydrog	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide	aves (B9) 13) 5) Odor (C1)		Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2)
Remarks:         DROL         Wetland         Primary I	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 turation (A3) ter Marks (B1) diment Deposits (B	icators: m of one is 2)	required; chea   	<u>k all that a</u> Water-: Aquatic Marl De Hydrog Oxidize	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide ed Rhizosph	aves (B9) 13) 5) Odor (C1) ieres on Livi	ing Roots (C3)	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8)
Remarks:         DROL         Wetland         Primary I	Hydric soils are p OGY Hydrology Indi I Hydrology Indi Indicators (minimul face Water (A1) the Water Table (A2 turation (A3) ther Marks (B1) diment Deposits (B ft Deposits (B3)	icators: m of one is 2) 32)	required; chea   	k all that a 	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide d Rhizosph ce of Redu	aves (B9) I3) 5) Odor (C1) ieres on Livi ced Iron (C <sup>2</sup>	ing Roots (C3)	Secondary Indicators (minimum of two require 
Remarks:         DROL         Vetland         Primary I	Hydric soils are p OGY Hydrology India I Hydrology India Indicators (minimul face Water (A1) the Water Table (A2 turation (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4	icators: m of one is 2) 32)	required; chea   	k all that a Water Aquatic Marl De Marl De Autor Present Recent	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide d Rhizosph ce of Redu Iron Redu	aves (B9) 13) 5) Odor (C1) teres on Livi ced Iron (C4 ction in Tille	ing Roots (C3)	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9 Stunted or Stressed Plants (D1)
Remarks: <b>DROL</b> Wetland Primary I Sur Hig Sat Wa Sec Drif Alg Lori Iron	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) th Water Table (A2 turation (A3) ter Marks (B1) diment Deposits (B ft Deposits (B3) al Mat or Crust (B4 n Deposits (B5)	i <b>cators:</b> <u>m of one is</u> 2) 32) 4)	required; chea           	k all that a	pply) Stained Lea Fauna (Bi eposits (B1 en Sulfide d Rhizosph ce of Redu Iron Redu uck Surface	aves (B9) 13) 5) Odor (C1) neres on Livi ced Iron (C4 ction in Tille e (C7)	ing Roots (C3)	Secondary Indicators (minimum of two require 
Remarks: <b>/ DROL</b> Wetland         Primary I	Hydric soils are p OGY Hydrology India Indicators (minimu face Water (A1) the Water Table (A2 curation (A3) ther Marks (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) undation Visible on	icators: m of one is 2) 32) 4) Aerial Imag	required; chea 	k all that a	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide d Rhizosph ce of Redu Iron Redu	aves (B9) 13) 5) Odor (C1) neres on Livi ced Iron (C4 ction in Tille e (C7)	ing Roots (C3)	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3)
Remarks:         DROL         Wetland         Primary I	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) th Water Table (A2 turation (A3) ter Marks (B1) diment Deposits (B ft Deposits (B3) al Mat or Crust (B4 n Deposits (B5)	icators: m of one is 2) 32) 4) Aerial Imag	required; chea 	k all that a	pply) Stained Lea Fauna (Bi eposits (B1 en Sulfide d Rhizosph ce of Redu Iron Redu uck Surface	aves (B9) 13) 5) Odor (C1) neres on Livi ced Iron (C4 ction in Tille e (C7)	ing Roots (C3)	Secondary Indicators (minimum of two required
Remarks:         DROL         Vetland         Primary I	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) th Water Table (A2 turation (A3) ter Marks (B1) diment Deposits (B ft Deposits (B3) al Mat or Crust (B4 n Deposits (B5) undation Visible on arsely Vegetated C	icators: m of one is 2) 32) 4) Aerial Imag	required; chea 	k all that a	pply) Stained Lea Fauna (Bi eposits (B1 en Sulfide d Rhizosph ce of Redu Iron Redu uck Surface	aves (B9) 13) 5) Odor (C1) neres on Livi ced Iron (C4 ction in Tille e (C7)	ing Roots (C3)	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3)
Remarks:         DROL         Vetland         Primary I	Hydric soils are p OGY Hydrology India Indicators (minimu face Water (A1) the Water Table (A2 curation (A3) ther Marks (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) andation Visible on arsely Vegetated Co servations:	icators: m of one is 2) 32) 4) Aerial Imag ioncave Surf	required; chea 	k all that a U Water Aquatic Marl De U Marl De U Oxidize U Oxidize U Presene U Recent U Thin M U Other (	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide d Rhizosph ce of Reduc Iron Reduc Iron Reduc uck Surface Explain in I	aves (B9) I3) 5) Odor (C1) neres on Livi ced Iron (C <sup>2</sup> ction in Tille e (C7) Remarks)	ing Roots (C3)	Secondary Indicators (minimum of two required
Remarks: TOROL Wetland Primary I Sur U Sur Sur Sur Sur Sur Sur Sur Sur	Hydric soils are p OGY Hydrology Indian I Hydrology Indian face Water (A1) the Water Table (A2 turation (A3) ther Marks (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B3) al Mat or Crust (B4 n Deposits (B5) andation Visible on arsely Vegetated Co servations: Vater Present?	icators: m of one is 2) 32) 4) Aerial Imag concave Surf Yes [	required; chea 	k all that a U Water Aquatic U Aquatic U Marl De U Hydrog U Oxidize U Presend U Recent U Thin M U Other (	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide d Rhizosph ce of Reduc Iron Reduc Iron Reduc uck Surface Explain in I	aves (B9) 13) 5) Odor (C1) neres on Livi ced Iron (C4 ction in Tille e (C7) Remarks)	ing Roots (C3)	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3) FAC-Neutral Test (D5) Microtopographic Relief (D4)
Remarks:         DROL         Primary I	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) the Water Table (A2 turation (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B3) al Mat or Crust (B4 n Deposits (B5) undation Visible on arsely Vegetated Co servations: Vater Present? ble Present? n Present?	icators: m of one is 2) 32) 4) Aerial Imag ioncave Surf	required; chea 	k all that a Water Aquatic Aquatic Aquatic Aquatic Aquatic Agent	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide d Rhizosph ce of Reduc Iron Reduc Iron Reduc uck Surface Explain in I	aves (B9) I3) 5) Odor (C1) teres on Livi ced Iron (C4 ction in Tille e (C7) Remarks) 5):	ing Roots (C3)	Secondary Indicators (minimum of two requires
Remarks: <b>DROL</b> Wetland Primary I Sur Sur Sur Alge Alge Drif Alge Drif Alge Drif Sur Star Field Ob Surface V Water Ta Saturation (includes	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) the Water Table (A2 turation (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B3) al Mat or Crust (B4 n Deposits (B5) undation Visible on arsely Vegetated Co servations: Vater Present? ble Present?	icators: <u>m of one is</u> 2) 32) 4) Aerial Imag concave Surf Yes [ Yes ] Yes [	required; chea 	k all that a Water Aquatic Aquatic Aquatic Aquatic Arrow A	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide d Rhizosph ce of Redur Iron Redur uck Surface Explain in I pth (inches pth (inches	aves (B9) 13) 5) Odor (C1) teres on Livi ced Iron (C4 ction in Tille e (C7) Remarks) 5): 5): 5):	ing Roots (C3) 4) ed Soils (C6)	Secondary Indicators (minimum of two requires
Remarks: (DROL Wetland Primary I Sur Surface V Water Ta Saturation (includes Describe	Hydric soils are p OGY Hydrology Indian I Hydrology Indian face Water (A1) the Water Table (A2 turation (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B3) al Mat or Crust (B4 n Deposits (B5) undation Visible on arsely Vegetated Co servations: Vater Present? ble Present? n Present? capillary fringe)	icators: <u>m of one is</u> 2) 32) 4) Aerial Imag ioncave Surf Yes [ Yes ] Yes ] Yes [	required; chea 	k all that a Water Aquatic Aquatic Aquatic Aquatic Aquatic Arrow Arro	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide d Rhizosph ce of Reduc Iron Reduc Uck Surface Explain in I pth (inches pth (inches pth (inches pth (inches	aves (B9) 13) 5) Odor (C1) teres on Livi ced Iron (C4 ction in Tille e (C7) Remarks) 5): 5): 5):	ing Roots (C3) 4) ed Soils (C6)	Secondary Indicators (minimum of two requires



Photo 18. Wetland 5. Data points 10 and 11, view to the south.



Photo 19. Wetland 5. General, view to the south.



Photo 20. Wetland 5. General, view to the north.

Project/Site: Crystal Airport (MIC) Airfield Improvements	City/County: <u>Hennepin</u> Sampling Date: <u>June 5, 2018</u>
Applicant/Owner: Metropolitan Airports Commission	State: Minnesota Sample Point: DP11
Investigator(s): Brauna Hartzell and Kim Shannon, Mead & Hunt, Inc.	Section, Township, Range: <u>S33, T119N, R21W</u>
Landform (hillslope, terrace, etc.): midslope Local relie	f (concave, convex, none): none Slope (%): <1%
Subregion (LRR or MLRA): K/155 Lat: 45.068436	Long: <u>-93.35264</u> Datum: <u>WGS84</u>
Soil Map Unit Name: Seelyeville and Markey soils, depressional, 0 to 1 pe	ercent slopes (D30A) NWI classification:
Are climatic hydrologic conditions on the site typical for this time of year?	Yes 🔲 No 🔟 (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significantly distu	rbed? Are "Normal Circumstances" present? <b>Yes No</b>
Are Vegetation, Soil, or Hydrology naturally problem	atic? (If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map showing sample	ing point locations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes 🗌 No 🖂	Is the Sampled Area
Hydric Soil Present? Yes 🛛 No 🗌	within a Wetland? Yes No
Wetland Hydrology Present? Yes 🗌 No 🛛	If yes, optional Wetland Side ID:

Remarks: (Explain alternative procedures here or in a separate report.) A WETS analysis of the antecedent precipitation indicates the hydrologic conditions on the site were drier than normal at the time of investigation. Area mown regularly; hydrologic alterations to surrounding area including construction of fence with berm on east and road embankment to north.

#### **VEGETATION - Use scientific names of plants**

	Absolute	Dominant	Indicator	50/20 Thresholds	20%	50%
Tree Stratum (Plot size:)	% Cover	Species?	Status	Tree Stratum		
1.				Sapling/Shrub Stratum		
2.				Herb Stratum	<u>20</u>	<u>50</u>
3.				Woody Vine Stratum		
4.				Dominance Test worksh	eet:	
				Number of Dominant Spec	ies	
5.		<b>-</b>		That Are OBL, FACW, or F	AC:	<u>0</u> (A)
		= Total Cov	ver	Total Number of Dominant		
Sapling/Shrub Stratum (Plot size:)				Species Across All Strata:		<u>1</u> (B)
1.	-			Percent of Dominant Speci	es	_ ( )
2.				That Are OBI, FACW, or FA		<u>0</u> (A/B)
3.				Prevalence Index work		<u>v</u> (. <i>1</i> = )
4.				Total % Cover of. Multipl		
5.	_			OBL species		
		= Total Cov	ver	FACW species		
<u>Herb Stratum</u> (Plot size: <u>5 ft.</u> )				FAC species		
1. Poa pratensis	95	Х	FACU		x 4 =	
2. Persicaria hydropiper	5		OBL	UPL species		
3.					A)	
4.				Prevalence Index = B/A =		(D)
5.				Hydrophytic Vegetation		
6.						
7.				Rapid Test for Hydro		etation
8.				Dominance Test is >		
9.				Prevalence Index is		
10.				Morphological Adapt	•	
11.				data in Remarks or o		
12.				Problematic Hydropl		
	100	= Total Cov	<i>r</i> er	present, unless disturbed o		, ,,
Woody Vine Stratum (Plot size:)		-			•	ι.
1.				Definitions of Vegetation		
2.	_			Tree – Woody plants 3 in. (7 breast height (DBH), regardle	'.6 cm) or mo ess of height.	ore in diameter at
		= Total Cov	ver	Sapling/shrub – Woody pla	_	
Remarks: (Include photo numbers here or on a separate	e sheet.) Hy	drophytic ve	egetation is	greater than 3.28 ft (1 m) tal	Ι.	
not present. Data point is 1-2 feet higher in elevation	TTAL ALL ALL ALL AND A AND A AND A	استامر لأرباء مترز				
(DP10).	than paired	wetland sar	mpling point	Herb – All herbaceous (non- and woody plants less than 3 Woody vines – All woody vi	.28 ft tall.	
	than paired	wetland sar	mpling point	and woody plants less than 3 Woody vines – All woody vi Hydrophytic V	3.28 ft tall. ines greater f	than 3.28 ft in height. Present?

SO	IL
----	----

epth	Matrix			Redox Fea				
nches)	Color (moist)	% (	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-12	2.5/N	100					loam	
12-20	2.5/N	100					loam	With undecomposed organic matter
/1	Concentration, D=	Depletion, RI	M=Reduced	Matrix, CS=	Covered o	r Coated San	d Grains.	<sup>2</sup> Location: PL=Pore Lining, M=Matrix.
<u> </u>	oil Indicators:							Indicators for Problematic Hydric
Histo				ripped Matr	. ,			2 cm Muck - (A10) (LRR K, L, MLRA 149
	c Epipedon (A2)					R, MLRA 1	-	Coast Prairie Redox (A16) (LRR K, L, F
	k Histic (A3)						MLRA 149 B	
🔲 Hydr	rogen Sulfide (A4)		<u> </u>	in Dark Su	face (S9)	(LRR R, ML	RA 149B)	Dark Surface (S7) <b>(LRR K, L)</b>
C Strat	tified Layers (A5)		Lo	amy Mucky	Mineral (F	<sup>-</sup> 1) (LRR K,	L)	Polyvalue Below Surface (S8) (LRR K,
Depl	leted Below Dark S	Surface (A11	) <u> </u>	amy Gleye	d Matrix (F	2)		Thin Dark Surface (S9) (LRR K, L)
🔟 Thick	k Dark Surface (A	12)	De	pleted Mat	rix (F3)			Iron-Manganese Masses (F12) (LRR K, L,
Sand	dy Mucky Mineral (	(S1)	<u> </u>	dox Dark S	urface (F6	)		Piedmont Floodplain Soils (F19) (MLRA 14
Sand	dy Gleyed Matrix (	S4)	🔲 De	pleted Dar	k Surface (	(F7)		Mesic Spodic (TA6) (MLRA 144A, 145, 149
Sand	dy Redox (S5)		<u> </u>	dox Depre	ssions (F8)			Red Parent Material (F21)
ndicators	of hydrophytic veg	etation and w	etland hydro	logy must b	e present,	unless disturb	ed or	Very Shallow Dark Surface (TF12)
oblematic	2.							Other (Explain in Remarks)
Restricti	ve Layer (if obse	erved):						
Туре:								Hydric Soil Present? Yes 🖄 No 🗌
Depth (in	ches):							
Remarks:	Hydric soil is pres	sent Hydric (	soil indicator	Thick Dark	(Surface (	Δ12) is satisf	ied	
YDROL				The Dur		(12) 10 500151	icai	
Wetland	Hydrology India	cators:						
Primary Iı	ndicators (minimur	m of one is re	equired; che	k all that a	oply)			Secondary Indicators (minimum of two required
Sur	face Water (A1)		_	Water-	Stained Lea	aves (B9)		Surface Soil Cracks (B6)
Hig <sup>r</sup>	h Water Table (A2	)	_	Aquatio	Fauna (B1	.3)		Drainage Patterns (B10)
-	uration (A3)			Marl De	eposits (B1	5)		Moss Trim Lines (B16)
	ter Marks (B1)		[	 Hydrog	en Sulfide	Odor (C1)		Dry-Season Water Table (C2)
	liment Deposits (Bi	2)				eres on Livin	a Roots (C3)	Crayfish Burrows (C8)
	t Deposits (B3)	,				ced Iron (C4)		Saturation Visible on Aerial Imagery (C9)
_	al Mat or Crust (B4	1)	<u>د                                    </u>			ction in Tilled		Stunted or Stressed Plants (D1)
	n Deposits (B5)	')	<u>د_</u> ا	_	uck Surface			Geomorphic Position (D2)
	ndation Visible on	Aprial Imago	 n/(B7) [	_	Explain in I			Shallow Aquitard (D3)
_		Achai Image				(cindiks)		FAC-Neutral Test (D5)
Inu		oncavo Surfa						
Inu	arsely Vegetated Co	oncave Surfa	ce (B8)					
Inui Spa	arsely Vegetated Co	oncave Surfa	ce (B8)					Microtopographic Relief (D4)
Inui Spa	arsely Vegetated Co servations:			1 Da	ath (inches	·).		
Inu Field Obs Surface W	servations: Vater Present?	Yes 🗌	] No 🗵		oth (inches			Indicators of
Inui     Inui     Spa     Field Obs     Surface W     Water Tal	servations: Vater Present? ble Present?	Yes [ Yes [	] No 🖂 ] No 🖂	] Dej	oth (inches	s):		
Field Obs Surface W Water Tal	servations: Vater Present?	Yes 🗌	] No 🖂 ] No 🖂	] Dej		s):		Indicators of Wetland Hydrology Present?
Field Obs Surface W Water Tal Saturatior (includes	arsely Vegetated Co servations: Vater Present? ble Present? n Present?	Yes Yes Yes	] No 🗵 ] No 🗵 ] No 🗵	] De ] De	oth (inches	;): ;):	tions), if avail	Indicators of Wetland Hydrology Present? Yes No_⊠_
Field Obs Surface W Water Tal Saturatior (includes Describe I	servations: Vater Present? ble Present? n Present? <u>capillary fringe)</u> Recorded Data (str	Yes Yes Yes ream gauge,	] No 🛛 ] No 🖾 ] No 🖄 monitoring,	] De ] De well, aerial	oth (inches oth (inches photos, pre	;): ;): evious inspec	-	Indicators of Wetland Hydrology Present? Yes No_⊠_



Photo 18. Wetland 5. Data points 10 and 11, view to the south.



Photo 19. Wetland 5. General, view to the south.



Photo 20. Wetland 5. General, view to the north.

Project/Site: Crystal Airport (MIC) Runway Improvements	City/County: <u>Hennepin</u> Sampling Date: <u>September 25, 2018</u>
Applicant/Owner: Metropolitan Airports Commission	State: Minnesota Sample Point: DP12
Investigator(s): Brauna Hartzell, Mead & Hunt, Inc.	Section, Township, Range: Section 4, T118N, R21W
Landform (hillslope, terrace, etc.): footslope Local relie	ef (concave, convex, none): <u>convex</u> Slope (%): <u>&gt;3%</u>
Subregion (LRR or MLRA): K/155 Lat: 45.055385	Long: <u>-93.348725</u> Datum: <u>WGS84</u>
Soil Map Unit Name: <u>Seelyeville and Markey soils, depressional, 0 to 1 p</u>	percent slopes (D30A) NWI classification:
Are climatic hydrologic conditions on the site typical for this time of year?	
Are Vegetation, Soil, or Hydrology significantly distu	ırbed? Are "Normal Circumstances" present? Yes No
Are Vegetation, Soil, or Hydrology naturally problem	natic? (If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map showing samp	ling point locations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes 🗌 No 🖂	Is the Sampled Area
Hydric Soil Present? Yes 🗌 No 🖂	within a Wetland? Yes No
Wetland Hydrology Present? Yes 🗌 No 🖂	If yes, optional Wetland Side ID:

Remarks: (Explain alternative procedures here or in a separate report.) A WETS analysis of the antecedent precipitation indicates the hydrologic conditions on the site were within normal range at the time of investigation. Area mown regularly; soil disturbance from fill/dumping of trash/debris

#### **VEGETATION - Use scientific names of plants**

Tree Stratum (Plot size:)       % Cover       Species?       Status       Tree Stratum
1.     Sapling/Shrub Stratum       2.     Image: Sapling/Shrub Stratum       3.     Image: Sapling/Shrub Stratum       4.     Image: Sapling/Shrub Stratum       5.     Image: Sapling/Shrub Stratum       Sapling/Shrub Stratum (Plot size: Image: Sapling Stra
2.     Herb Stratum <u>20</u> <u>50</u> 3.
3.     Woody Vine Stratum       4.     Dominance Test worksheet:       5.     Number of Dominant Species       5.     That Are OBL, FACW, or FAC:     0 (A)       Sapling/Shrub Stratum (Plot size:)     Total Cover     Total Number of Dominant       1.     Species Across All Strata:     3 (B)       2.     Percent of Dominant Species
4.     Dominance rest worksheet:       4.     Number of Dominant Species       5.     Image: Sapling/Shrub Stratum (Plot size:)     Image: Sapling Shrub Stratum (Plot size:)       1.     Image: Sapling Shrub Stratum (Plot size:)     Image: Sapling Shrub Stratum (Plot size:)       2.     Image: Sapling Shrub Stratum (Plot size:)     Image: Sapling Shrub Stratum (Plot size:)
5.     Number of Dominant Species       5.
Sapling/Shrub Stratum (Plot size:)     = Total Cover     Total Number of Dominant       1.     Species Across All Strata:     3 (B)       2.     Percent of Dominant Species
Sapling/Shrub Stratum (Plot size:)     Total Number of Dominant       1.     Species Across All Strata: 3 (B)       2.     Percent of Dominant Species
1.     Species Across All Strata:     3 (B)       2.     Percent of Dominant Species
2. Percent of Dominant Species
3. That Are OBI, FACW, or FAC: <u>0</u> (A/B)
Prevalence Index worksheet
4. <u>Total % Cover of. Multiply by:</u>
5. OBL species X 1 =
= Total Cover FACW species x 2 =
Herb Stratum (Plot size: 5 feet)     FAC species     x 3 =
1. Poa pratensis     50     X     FACU       2. Disitrate is the summer     20     X     FACU
2. Digitaria ischaemum $30$ X FACU UPL species $x 5 =$
3. Elymus repens 20 X FACU Column Totals: (A) (B)
4. Provalence Index – B/A –
5. Hydrophytic Vegetation Indicators
6. Danid Tott for Hydrophytic Vogetation
8 Prevalence Index is <3.01
9. Morphological Adaptations' (Provide supporting
10. data in Remarks or on a separate sheet)
11 Problematic Hydrophytic Vegetation' (Explain)
12. Indicators of hydric soil and wetland hydrology must be
<u>100</u> = Total Cover present, unless disturbed or problematic.
Woody Vine Stratum (Plot size:) Definitions of Vegetation Strata:
1. Tree – Woody plants 3 in (7.6 cm) or more in diameter at
2. breast height (DBH), regardless of height.
= Total Cover Sapling/shrub – Woody plants less than 3 in. DBH and
Remarks: (Include photo numbers here or on a separate sheet.) Hydrophytic vegetation is greater than 3.28 ft (1 m) tall.
not present. About 6 inches above paired wetland point (DP 13) with about 25 feet Herb – All herbaceous (non-woody) plants, regardless of size,
separation of the two points. and woody plants less than 3.28 ft tall. <b>Woody vines</b> – All woody vines greater than 3.28 ft in height.
Hydrophytic Vegetation Present?
Yes $\square$ No $\square$

	Matrix			Redox Fea	itures			
inches)	Color (moist)	%	Color (moist	) %	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-8	10YR 3/2	100					Sandy loar	n
8-16	10YR 4/3	100					Sand	Mixed, trash, glass, etc.
16-20	5YR 3/2	100					sand	
20-24	10YR 2/1	100					Silt	Original hydric layer
Type: C=	Concentration, D=	Depletion,	RM=Reduced	Matrix, CS=	Covered o	r Coated Sa	and Grains.	<sup>2</sup> Location: PL=Pore Lining, M=Matrix.
Hydric S	oil Indicators:		_					Indicators for Problematic Hydric
Histo	osol (A1)			tripped Mat				2 cm Muck - (A10) (LRR K, L, MLRA 149
📃 Histi	c Epipedon (A2)		<u> </u>	ark Surface	(S7) <b>(LRF</b>	R R, MLRA	149B)	Coast Prairie Redox (A16) (LRR K, L,
Blacl	k Histic (A3)		P	olyvalue Belo	ow Surface	(S8) <b>(LRR</b>	R, MLRA 149 E	3) 5 cm Peat or Mucky Peat (S3) (LRR K, L,
<u> </u>	rogen Sulfide (A4)	)	Т_	hin Dark Su	rface (S9)	(LRR R, M	ILRA 149B)	Dark Surface (S7) (LRR K, L)
C Strat	tified Layers (A5)			bamy Mucky	y Mineral (I	F1) (LRR H	(, L)	Polyvalue Below Surface (S8) (LRR K,
Depl	eted Below Dark	Surface (A1	L1) 🔲 L	oamy Gleye	d Matrix (F	2)		Thin Dark Surface (S9) (LRR K, L)
Thicl	k Dark Surface (A	12)	<u> </u>	epleted Mai	trix (F3)			Iron-Manganese Masses (F12) (LRR K, L,
Sand	ly Mucky Mineral	(S1)	<u> </u>	edox Dark S	Surface (F6	<b>)</b>		Piedmont Floodplain Soils (F19) (MLRA 14
Sanc	ly Gleyed Matrix (	(S4)	<u> </u>	epleted Dar	k Surface (	(F7)		Mesic Spodic (TA6) <b>(MLRA 144A, 145, 149</b>
Sanc	ly Redox (S5)		R	edox Depre	ssions (F8)	)		Red Parent Material (F21)
Indicators	of hydrophytic veg	etation and	wetland hvdr	oloav must l	present,	unless distu	irbed or	Very Shallow Dark Surface (TF12)
roblematic			,	57	. ,			Other (Explain in Remarks)
Restricti	ve Layer (if obse	erved):						
Depth (in	ches):							Hydric Soil Present? Yes 🗌 No 🛛
Remarks:	Hydric soils are r	not present.	. Does not m	eet hydric s	soils criteria	a. Very miz	xed soils in upp	ber layers due to filling/dumping of materials.
Remarks: YDROL	Hydric soils are r		. Does not m	eet hydric s	soils criteria	a. Very mix	xed soils in upp	
Remarks: YDROL Wetland	Hydric soils are r OGY	cators:				a. Very miz	xed soils in upp	
Remarks: YDROL Wetland Primary In	Hydric soils are r OGY Hydrology Indi ndicators (minimu	cators:	required; che	ck all that a	pply)		xed soils in upp	per layers due to filling/dumping of materials. Secondary Indicators (minimum of two require
Remarks: YDROL Wetland Primary In	Hydric soils are r OGY Hydrology Indi ndicators (minimu face Water (A1)	cators: m of one is	required; che	ck all that a	pply) Stained Lea	aves (B9)	xed soils in upp	ber layers due to filling/dumping of materials. <u>Secondary Indicators (minimum of two require</u> Surface Soil Cracks (B6)
Remarks: Y DROL Wetland Primary II Sur Hig	Hydric soils are r OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2	cators: m of one is	required; che -	ck all that a	pply) Stained Lea c Fauna (B1	aves (B9) 13)	xed soils in upp	ber layers due to filling/dumping of materials.  Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10)
Remarks: Y DROL Wetland Primary In Sur Hig Satu	Hydric soils are r OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3)	cators: m of one is	required; che - - -	ck all that a Water- Aquatio Marl D	pply) Stained Lea : Fauna (B1 eposits (B1	aves (B9) 13) 5)	xed soils in upp	Secondary Indicators (minimum of two require
Remarks: Y DROL Wetland Primary In Sur Hig Sat Wa	Hydric soils are r OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1)	cators: m of one is	required; che - - -	ck all that a Water- Aquatio Marl D Hydrog	pply) Stained Lea Fauna (B1 eposits (B1 gen Sulfide	aves (B9) 13) 5) Odor (C1)		Secondary Indicators (minimum of two require
Remarks: Y DROL Wetland Primary II Sur Hig Satu War Sed	Hydric soils are r OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B	cators: m of one is	required; che - - - - -	ck all that a	pply) Stained Lea Fauna (B1 eposits (B1 gen Sulfide ed Rhizosph	aves (B9) 13) 5) Odor (C1) ieres on Liv	ring Roots (C3)	Secondary Indicators (minimum of two require
Remarks: Y DROL Wetland Primary In Sur Hig Sat Wa Sed Drif	Hydric soils are r OGY Hydrology Indi Indicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B t Deposits (B3)	cators: m of one is 2)	required; che - - - - -	ck all that a Water- Aquatic Marl D Hydrog Oxidize Presen	pply) Stained Lea Fauna (B1 eposits (B1 yen Sulfide ed Rhizosph ce of Redu	aves (B9) I.3) 5) Odor (C1) Ieres on Liv ced Iron (C	ring Roots (C3)	Secondary Indicators (minimum of two requires
Remarks: Y DROL Wetland Primary II Sur Hig Sur Kalon Satu Satu Drif Alga Alga	Hydric soils are r OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4	cators: m of one is 2)	required; che - - - - -	ck all that a          Water-          Aquation          Marl D          Notice          Presen	pply) Stained Lea Fauna (B1 eposits (B1 gen Sulfide ed Rhizosph ce of Redu	aves (B9) 13) 5) Odor (C1) heres on Liv ced Iron (C ction in Tille	ring Roots (C3)	Secondary Indicators (minimum of two requires
Remarks: Y DROL Wetland Primary II Sur Hig Satu Sed Sed Alga Iror	Hydric soils are r OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B1) t Deposits (B3) al Mat or Crust (B4 n Deposits (B5)	<b>cators:</b> <u>m of one is</u> 2) 22) 4)	<u>required; che</u> - - - - - - -	ck all that a       Water-       Aquation       Aquation       Hydrog       Oxidize       Presen       Recent       Thin M	pply) Stained Lea Fauna (B1 eposits (B1 gen Sulfide ed Rhizosph ce of Reduc I Iron Reduc uck Surface	aves (B9) 13) 5) Odor (C1) aeres on Liv ced Iron (C ction in Tilla e (C7)	ring Roots (C3)	Secondary Indicators (minimum of two requires
Remarks: Y DROL Wetland Primary II Sur Hig Sat Sed Sed Drif Alga Iror Inu	Hydric soils are r OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on	<b>cators:</b> <u>m of one is</u> 2) 2) 4) Aerial Imag	<u>required; che</u> - - - - - - - - - - - - - - - - - - -	ck all that a       Water-       Aquation       Aquation       Hydrog       Oxidize       Presen       Recent       Thin M	pply) Stained Lea Fauna (B1 eposits (B1 gen Sulfide ed Rhizosph ce of Redu	aves (B9) 13) 5) Odor (C1) aeres on Liv ced Iron (C ction in Tilla e (C7)	ring Roots (C3)	Secondary Indicators (minimum of two requires
Remarks: Y DROL Wetland Primary II Sur Hig Sat Sed Sed Drif Alga Iror Inu	Hydric soils are r OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B1) t Deposits (B3) al Mat or Crust (B4 n Deposits (B5)	<b>cators:</b> <u>m of one is</u> 2) 2) 4) Aerial Imag	<u>required; che</u> - - - - - - - - - - - - - - - - - - -	ck all that a       Water-       Aquation       Aquation       Hydrog       Oxidize       Presen       Recent       Thin M	pply) Stained Lea Fauna (B1 eposits (B1 gen Sulfide ed Rhizosph ce of Reduc I Iron Reduc uck Surface	aves (B9) 13) 5) Odor (C1) aeres on Liv ced Iron (C ction in Tilla e (C7)	ring Roots (C3)	Secondary Indicators (minimum of two requires)
Remarks: Y DR OL Wetland Primary II Sur Sur Sur Sur Sur Sur Sur Sur Sur Sur Sur Sur Spa	Hydric soils are r OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on arsely Vegetated C	<b>cators:</b> <u>m of one is</u> 2) 2) 4) Aerial Imag	<u>required; che</u> - - - - - - - - - - - - - - - - - - -	ck all that a       Water-       Aquation       Aquation       Hydrog       Oxidize       Presen       Recent       Thin M	pply) Stained Lea Fauna (B1 eposits (B1 gen Sulfide ed Rhizosph ce of Reduc I Iron Reduc uck Surface	aves (B9) 13) 5) Odor (C1) aeres on Liv ced Iron (C ction in Tilla e (C7)	ring Roots (C3)	Secondary Indicators (minimum of two requires
Remarks: Y DR OL Wetland Primary II 	Hydric soils are r OG Y Hydrology Indi indicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on ursely Vegetated Co servations:	cators: <u>m of one is</u> 2) 2) 4) Aerial Ima <u>c</u> oncave Surf	required; che - - - - - - - - - - - - - - - - - - -	ck all that a U Water- Aquatic Marl D U Hydrog Oxidize Presen C Recent C Thin M Other (	pply) Stained Lea Fauna (B1 eposits (B1 gen Sulfide ed Rhizosph ce of Reduc I ron Reduc I ron Reduc uck Surface (Explain in 1	aves (B9) I.3) 5) Odor (C1) neres on Liv ced Iron (C ction in Tille e (C7) Remarks)	ring Roots (C3)	Secondary Indicators (minimum of two requires
Remarks: Y DR OL Wetland Primary II Sur Sur Surface V	Hydric soils are r OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on arsely Vegetated Co servations: Vater Present?	cators: <u>m of one is</u> 2) 2) 4) Aerial Ima <u>c</u> 5oncave Surf Yes	required; che - - - - - - - - - - - - - - - - - - -	ck all that a	pply) Stained Lea Fauna (B1 eposits (B1 gen Sulfide ed Rhizosph ce of Redu ce of Redu it ron Redu uck Surface (Explain in I (Explain in I	aves (B9) 13) 5) Odor (C1) neres on Liv ced Iron (C ction in Tille e (C7) Remarks)	ring Roots (C3)	Secondary Indicators (minimum of two requires
Remarks: Y DROL Wetland Primary II Sur Sur Sur Sur Field Ob Surface W Water Tal	Hydric soils are r OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4 h Deposits (B5) ndation Visible on arsely Vegetated Co servations: Vater Present?	cators: <u>m of one is</u> 2) 4) Aerial Ima <u>c</u> ioncave Surf Yes Yes	required; che - - - - - - - - - - - - - - - - - - -	ck all that a	pply) Stained Lea Fauna (B1 eposits (B1 gen Sulfide d Rhizosph ce of Redu is Iron Redu uck Surface (Explain in I (Explain in I pth (inches pth (inches	aves (B9) I3) 5) Odor (C1) heres on Liv ced Iron (C ction in Tille e (C7) Remarks) 5): 5):	ring Roots (C3)	Secondary Indicators (minimum of two requires
Remarks: Y DR OL Wetland Primary II Sur Sur Sur Sur Surface V Water Tal Saturation	Hydric soils are r OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on arsely Vegetated Co servations: Vater Present? ble Present? n Present?	cators: <u>m of one is</u> 2) 2) 4) Aerial Ima <u>c</u> 5oncave Surf Yes	required; che - - - - - - - - - - - - - - - - - - -	ck all that a	pply) Stained Lea Fauna (B1 eposits (B1 gen Sulfide ed Rhizosph ce of Redu ce of Redu it ron Redu uck Surface (Explain in I (Explain in I	aves (B9) I3) 5) Odor (C1) heres on Liv ced Iron (C ction in Tille e (C7) Remarks) 5): 5):	ring Roots (C3)	Secondary Indicators (minimum of two requires
Remarks: Y DR OL Wetland Primary II Sur Sur Sur Sur Sur Surface V Water Tal Saturatior (includes	Hydric soils are r OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4 h Deposits (B5) ndation Visible on arsely Vegetated Co servations: Vater Present?	cators: <u>m of one is</u> 2) 4) Aerial Imag concave Surf Yes Yes Yes Yes	required; che - - - - - - - - - - - - - - - - - - -	ck all that a	pply) Stained Lea Fauna (B1 eposits (B1 gen Sulfide ed Rhizosph ce of Reduu ck Surface (Explain in l pth (inches pth (inches pth (inches	aves (B9) 13) 5) Odor (C1) heres on Liv ced Iron (C ction in Tille e (C7) Remarks) 5): 5): 5):	ing Roots (C3) 4) ed Soils (C6)	Secondary Indicators (minimum of two requires
Remarks: Y DROL Wetland Primary II Sur Sur Sur Sur Surface V Water Tal Saturatior (includes	Hydric soils are r OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4 h Deposits (B5) ndation Visible on arsely Vegetated Co servations: Vater Present? ble Present? h Present? capillary fringe)	cators: <u>m of one is</u> 2) 4) Aerial Imag concave Surf Yes Yes Yes Yes	required; che - - - - - - - - - - - - - - - - - - -	ck all that a	pply) Stained Lea Fauna (B1 eposits (B1 gen Sulfide ed Rhizosph ce of Reduu ck Surface (Explain in l pth (inches pth (inches pth (inches	aves (B9) 13) 5) Odor (C1) heres on Liv ced Iron (C ction in Tille e (C7) Remarks) 5): 5): 5):	ing Roots (C3) 4) ed Soils (C6)	Secondary Indicators (minimum of two requires
Remarks: <b>/DROL</b> Wetland Primary II 	Hydric soils are r OGY Hydrology Indi indicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4 n Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on ursely Vegetated Co servations: Vater Present? ble Present? n Present? capillary fringe) Recorded Data (st	cators: m of one is 2) (2) (2) (2) (2) (2) (2) (2) (2) (2)	required; che	ck all that a	pply) Stained Lea Fauna (B1 eposits (B1 gen Sulfide ed Rhizosph ce of Reduc i Iron Reduc uck Surface (Explain in l pth (inches pth (inches pth (inches photos, pro	aves (B9) I3) 5) Odor (C1) heres on Liv ced Iron (C ction in Tille e (C7) Remarks) 5): 5): evious inspe-	ing Roots (C3) 4) ed Soils (C6)	Secondary Indicators (minimum of two required)         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)         Shallow Aquitard (D3)         FAC-Neutral Test (D5)         Microtopographic Relief (D4)



Photo 21. Wetland 6. Data points 12 and 13. View to the north.



Photo 22. Wetland 6. Data points 12 and 13. View to the west.



Photo 24. Wetland 6. General, view to the north.



Photo 25. Wetland 6. General, view to the south.

				epin Sampling Date: September 25, 2018
Applicant/Owner: Metropolitan Airports Commission		State	: <u>Minnesota</u>	Sample Point: DP 13
				n, Township, Range: Section 4, T118N, R21W
				none): <u>concave</u> Slope (%): <u>&lt; 1%</u>
· · · ·				-93.348754 Datum: WGS84
Soil Map Unit Name: <u>Seelyeville and Markey soils, dep</u>	pressional, 0 to	o 1 percent	slopes (D30A	.) NWI classification: <u>PEM</u>
Are climatic hydrologic conditions on the site typical for	this time of ye	ar? Yes [	🛛 No 🔲	(If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology	_ significantly	disturbed?	Are "Norr	nal Circumstances" present? Yes No
Are Vegetation, Soil, or Hydrology	_ naturally pro	blematic?	(If neede	d, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map	showing sa	mpling p	oint locatio	ons, transects, important features, etc.
Hydrophytic Vegetation Present? Yes 🛛	No		Is the Sam	npled Area
Hydric Soil Present? Yes 🖂	No		within a W	/etland? Yes <u> </u>
Wetland Hydrology Present? Yes 🖂	No		If yes, optio	nal Wetland Side ID: <u>6</u>
Remarks: (Explain alternative procedures here or in conditions on the site were within normal range at	•	. ,	-	of the antecedent precipitation indicates the hydrologic ed due to filling; vegetation regularly mowed.
VEGETATION - Use scientific names of plan	ts			
	Absolute	Dominant	Indicator	<b>50/20 Thresholds</b> 20% 50%
Tree Stratum (Plot size:)	% Cover	Species?	Status	Tree Stratum
1.				Sapling/Shrub Stratum
2.				Herb Stratum <u>20</u> <u>50</u>
3.	_			Woody Vine Stratum
4.				Dominance Test worksheet:
5.				Number of Dominant Species
5.		= Total Co	or	That Are OBL, FACW, or FAC: $1$ (A)
Sapling/Shrub Stratum (Plot size:)				Total Number of Dominant
1.				Species Across All Strata: <u>2</u> (B)
2.				Percent of Dominant Species
3.				That Are OBI, FACW, or FAC: 50 (A/B)
4.				Prevalence Index worksheet:
5.				Total % Cover of. Multiply by:
	_	= Total Co	ver	OBL species $35$ x 1 = $35$
Herb Stratum (Plot size: 5 feet)				FACW species $\underline{0}$ x 2 = $\underline{0}$
1. Digitaria ischaemum	40	Х	FACU	FAC species $5 \times 3 = 15$
2. Echinochloa muricata	30	Х	OBL	FACU species $\underline{60}$ x 4 = $\underline{240}$
3. Poa pratensis	10		FACU	UPL species $\underline{0}$ x 5 = $\underline{0}$
4. Elymus repens	10		FACU	Column Totals: <u>100</u> (A) <u>290</u> (B)
5. Persicaria maculosa	5		FAC	Prevalence Index = $B/A = 2.9$
6. Scirpus atrovirens	5		OBL	Hydrophytic Vegetation Indicators:
7.				□ Rapid Test for Hydrophytic Vegetation □ Dominance Test is >50%
8.				
9.				$\square$ Prevalence Index is ≤3.0 <sup>1</sup> $\square$ Morphological Adaptations' (Provide supporting
10.				
11.				data in Remarks or on a separate sheet)
12.				Problematic Hydrophytic Vegetation' (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be
	100	= Total Cov	ver	present, unless disturbed or problematic.
Woody Vine Stratum (Plot size:)				Definitions of Vegetation Strata:
1.				<b>Tree</b> – Woody plants 3 in. (7.6 cm) or more in diameter at
2.				breast height (DBH), regardless of height.
Demarka: (Include photo numbers here er en a const		= Total Cov		<b>Sapling/shrub</b> – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
Remarks: (Include photo numbers here or on a separation showing a separa	, ,	• •	0	Herb – All herbaceous (non-woody) plants, regardless of size,
present by PI of 2.9. Near boundary; vegetation sh mowing.		e season an	iiiuais,	and woody plants less than 3.28 ft tall. <b>Woody vines</b> – All woody vines greater than 3.28 ft in height.
				Hydrophytic Vegetation Present?
				Yes No

SO	IL
----	----

epth	Matrix			Redox Fea				
nches)	Color (moist)	%	Color (mois	) %	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-6	10YR 3/2	100					Sand	With pebbles; fill layer
6-16	10YR 3/2	97	5YR 4/6	3	С	М	Sand	
16-22	10YR 2/1	100					Silt	Original hydric layer
	Concentration, D=	Depletion	, RM=Reduced	Matrix, CS=	=Covered o	r Coated Sar	nd Grains.	<sup>2</sup> Location: PL=Pore Lining, M=Matrix.
<u> </u>	oil Indicators:				. (22)			Indicators for Problematic Hydric
Histo				ripped Mat				2 cm Muck - (A10) (LRR K, L, MLRA 149
	c Epipedon (A2)					R R, MLRA :	-	Coast Prairie Redox (A16) (LRR K, L, F
	k Histic (A3)		<u> </u>	olyvalue Bel	ow Surface	(S8) <b>(LRR R</b>	, MLRA 149 E	3) 5 cm Peat or Mucky Peat (S3) (LRR K, L, I
L Hydr	rogen Sulfide (A4)	)	<u>П</u> Т	nin Dark Su	irface (S9)	(LRR R, MI	LRA 149B)	Dark Surface (S7) <b>(LRR K, L)</b>
C Strat	tified Layers (A5)		<u> </u>	amy Muck	y Mineral (	F1) (LRR K,	, L)	Polyvalue Below Surface (S8) (LRR K,
Depl	leted Below Dark	Surface (A	11) <u> </u>	oamy Gleye	d Matrix (F	2)		Thin Dark Surface (S9) (LRR K, L)
Thicl	k Dark Surface (A	12)		epleted Ma	trix (F3)			Iron-Manganese Masses (F12) (LRR K, L,
C Sanc	dy Mucky Mineral	(S1)	<u> </u>	edox Dark S	Surface (F6	5)		Piedmont Floodplain Soils (F19) (MLRA 14
C Sanc	dy Gleyed Matrix (	(S4)		epleted Dai	rk Surface	(F7)		Mesic Spodic (TA6) (MLRA 144A, 145, 1491
🛛 Sanc	dy Redox (S5)		<u> </u>	edox Depre	ssions (F8)	)		Red Parent Material (F21)
ndicators	of hydrophytic veg	etation an	d wetland hydr	ology must l	be present,	unless distur	bed or	Very Shallow Dark Surface (TF12)
roblematic		,						Other (Explain in Remarks)
Restricti	ve Layer (if obs	erved):						
Type: Depth (in Remarks: of fill mat <b>(DROL</b>	ches): Hydric soils are p rerials. .OGY	present. H	ydric soil indic	ator Sandy	Redox (S5)	) is satisfied,	, considering f	Hydric Soil Present? Yes 🛛 No 🗌
Type: Depth (in Remarks: of fill mat <b>( DROL</b> Wetland	ches): Hydric soils are p erials. .OGY Hydrology Indi	oresent. H cators:				) is satisfied,	, considering f	ill layer. Original hydric layer covered by 16 inch
Type: Depth (in Remarks: of fill mat <b>/ DROL</b> Wetland Primary In	ches): Hydric soils are p erials. .OGY Hydrology Indi ndicators (minimu	oresent. H cators:	s required; che	ck all that a	apply)		, considering f	ill layer. Original hydric layer covered by 16 inch Secondary Indicators (minimum of two required
Type: Depth (in Remarks: of fill mat <b>/ DROL</b> Wetland Primary In Sur		oresent. H cators: m of one i	s required; che	ck all that a	apply) Stained Lea	aves (B9)	, considering f	ill layer. Original hydric layer covered by 16 inch Secondary Indicators (minimum of two required Surface Soil Cracks (B6)
Type: Depth (in Remarks: of fill mat <b>/ DROL</b> Wetland Primary In Sur Sur Hig		oresent. H cators: m of one i	s required; che	ck all that a	apply) Stained Lea c Fauna (B:	aves (B9) 13)	, considering f	ill layer. Original hydric layer covered by 16 inch <u>Secondary Indicators (minimum of two required</u> Surface Soil Cracks (B6) Drainage Patterns (B10)
Type: Depth (in Remarks: of fill mat <b>/ DROL</b> <b>Wetland</b> Primary In Surt Hig Satu	ches): Hydric soils are p erials. OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3)	oresent. H cators: m of one i	s required; che	ck all that a	apply) Stained Lea c Fauna (B: eposits (B1	aves (B9) 13) 5)	, considering f	ill layer. Original hydric layer covered by 16 inch         Secondary Indicators (minimum of two required
Type: Depth (in Remarks: of fill mat <b>/ DROL</b> Wetland Primary In Sur Sur Higl Satu	Additional content of the series of the seri	oresent. H cators: m of one i	s required; che	ck all that a 	apply) Stained Lea c Fauna (B: eposits (B1 gen Sulfide	aves (B9) 13) 5) Odor (C1)		Secondary Indicators (minimum of two required
Type: Depth (in Remarks: of fill mat <b>/ DROL</b> Wetland Primary In Suri Higi Satu Wat Sed	Hydric soils are paratesis. OGY Hydrology Indi I Hydrology Indi I dicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B	oresent. H cators: m of one i	s required; che	ck all that a Water- Aquation Marl D Hydrog	apply) Stained Lea c Fauna (B: eposits (B1 gen Sulfide ed Rhizosph	aves (B9) I3) 5) Odor (C1) neres on Livir	ng Roots (C3)	ill layer. Original hydric layer covered by 16 inch         Secondary Indicators (minimum of two required
Type: Depth (in Remarks: of fill mat <b>/ DROL</b> Wetland Primary II Sur Hig Satu Sed Sed	Additional and the set of the set	cators: m of one i	s required; che	ck all that a	apply) Stained Lea c Fauna (B: eposits (B1 gen Sulfide ed Rhizosph ice of Redu	aves (B9) 13) 5) Odor (C1) neres on Livir ced Iron (C4	ng Roots (C3)	Secondary Indicators (minimum of two required
Type: Depth (in Remarks: of fill mat <b>/ DROL</b> Wetland Primary II Sur Hig Satu Sed Sed	Hydric soils are paratesis. OGY Hydrology Indi I Hydrology Indi I dicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B	cators: m of one i	s required; che	ck all that a	apply) Stained Lea c Fauna (B: eposits (B1 gen Sulfide ed Rhizosph ice of Redu	aves (B9) I3) 5) Odor (C1) neres on Livir	ng Roots (C3)	ill layer. Original hydric layer covered by 16 inch         Secondary Indicators (minimum of two required
Type: Depth (in Remarks: of fill mat <b>/ DROL</b> Wetland Primary In Sur Sur Higl Satu Sed Drif Alga	Additional and the set of the set	cators: m of one i	<u>s required; che</u> - - - - - - -	ck all that a Water- Aquatio Marl D Hydrog Oxidize	apply) Stained Lea c Fauna (B: eposits (B1 gen Sulfide ed Rhizosph ice of Redu	aves (B9) L3) 5) Odor (C1) neres on Livir ced Iron (C4 ction in Tilled	ng Roots (C3)	ill layer. Original hydric layer covered by 16 inch         Secondary Indicators (minimum of two required
Type: Depth (in Remarks: of fill mat <b>/ DROL</b> Wetland Primary In Sur	Hydric soils are perials. OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4	cators: m of one i 2) 2)	<u>s required; che</u> - - - - - - - - -	ck all that a       Water-       Aquation       Aquation       Hydrog       Oxidize       Present       Thin Marce	apply) Stained Lea c Fauna (B: eposits (B1 gen Sulfide ed Rhizosph ice of Redu t Iron Redu	aves (B9) 13) 5) Odor (C1) neres on Livir ced Iron (C4 ction in Tilled e (C7)	ng Roots (C3)	Secondary Indicators (minimum of two required
Type: Depth (in Remarks: of fill mat <b>/ DROL</b> Wetland Primary II Sur Higl Sed Sed Sed Drif Alga Iror Inu	Hydric soils are prerials. OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4) n Deposits (B5)	cators: m of one i 2) 2) 4) Aerial Ima	<u>s required; che</u> - - - - - - - - - - - - - - - - - - -	ck all that a       Water-       Aquation       Aquation       Hydrog       Oxidize       Present       Thin Marce	apply) Stained Lea c Fauna (B: eposits (B1 gen Sulfide ed Rhizosph ace of Redu t Iron Redu luck Surface	aves (B9) 13) 5) Odor (C1) neres on Livir ced Iron (C4 ction in Tilled e (C7)	ng Roots (C3)	Secondary Indicators (minimum of two required         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Saturation Visible on Aerial Imagery (C9)         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)
Type: Depth (in Remarks: of fill mat <b>/ DROL</b> Wetland Primary II Sur Higl Sed Sed Sed Drif Alga Iror Inu	Additional and a constraints and a constraints and a constraint  (B2) and a co	cators: m of one i 2) 2) 4) Aerial Ima	<u>s required; che</u> - - - - - - - - - - - - - - - - - - -	ck all that a       Water-       Aquation       Aquation       Hydrog       Oxidize       Present       Thin Marce	apply) Stained Lea c Fauna (B: eposits (B1 gen Sulfide ed Rhizosph ace of Redu t Iron Redu luck Surface	aves (B9) 13) 5) Odor (C1) neres on Livir ced Iron (C4 ction in Tilled e (C7)	ng Roots (C3)	Secondary Indicators (minimum of two required
Type: Depth (in Remarks: of fill mat <b>/ DROL</b> Wetland Primary In Sur Sur Sur Sur Sur Sur Sur Sur Sur Sur Sur Sur Sur Sur Sur Sur Spa	Additional and a constraints and a constraints and a constraint  (B2) and a co	cators: m of one i 2) 2) 4) Aerial Ima	<u>s required; che</u> - - - - - - - - - - - - - - - - - - -	ck all that a       Water-       Aquation       Aquation       Hydrog       Oxidize       Present       Thin Marce	apply) Stained Lea c Fauna (B: eposits (B1 gen Sulfide ed Rhizosph ace of Redu t Iron Redu luck Surface	aves (B9) 13) 5) Odor (C1) neres on Livir ced Iron (C4 ction in Tilled e (C7)	ng Roots (C3)	Secondary Indicators (minimum of two required         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Saturation Visible on Aerial Imagery (C9)         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)         Shallow Aquitard (D3)         Hicrotopographic Relief (D4)
Type: Depth (in Remarks: of fill mat <b>/ DROL</b> Wetland Primary II Sur Higl Satu Sed Orif Alga Iror Inu Spa	Additional and the provided and the prov	2) Aerial Ima oncave Su	<u>s required; che</u> - - - - - - - - - - - - - - - - - - -	ck all that a	apply) Stained Lea c Fauna (B: eposits (B1 gen Sulfide ed Rhizosph ace of Redu t Iron Redu luck Surface	aves (B9) L3) 5) Odor (C1) neres on Livir ced Iron (C4 ction in Tilleo e (C7) Remarks)	ng Roots (C3)	ill layer. Original hydric layer covered by 16 inch         Secondary Indicators (minimum of two required         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Saturation Visible on Aerial Imagery (C9)         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)         Shallow Aquitard (D3)         FAC-Neutral Test (D5)         Microtopographic Relief (D4)
Type: Depth (in Remarks: of fill mat <b>/ DROL</b> Wetland Primary II Sur Sur Satu Satu Satu Sed Drif Alga Inu Spa Field Obs Surface W	hydric soils are perials. OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) timent Deposits (B3) al Mat or Crust (B4) n Deposits (B5) ndation Visible on arsely Vegetated C servations:	2) Aerial Ima oncave Su	s required; che - - - - - - - - - - - - - - - - - - -	ck all that a	apply) Stained Lea c Fauna (B: eposits (B1 gen Sulfide ed Rhizosph ice of Redu ice of Redu t Iron Redu luck Surface (Explain in	aves (B9) 13) 5) Odor (C1) neres on Livir ced Iron (C4 ction in Tilled e (C7) Remarks)	ng Roots (C3)	ill layer. Original hydric layer covered by 16 inch         Secondary Indicators (minimum of two required         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Saturation Visible on Aerial Imagery (C9)         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)         Shallow Aquitard (D3)         FAC-Neutral Test (D5)         Microtopographic Relief (D4)         Indicators of         Wetland Hydrology Present?
Type: Depth (in Remarks: of fill mat <b>/ DROL</b> Wetland Primary II Sur Satu Satu Sed Orif Inu Spa Field Ob: Surface W Water Tal Saturatior	Indicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on arsely Vegetated C servations: Vater Present? ble Present? n Present?	2) Aerial Ima oncave Su Yee Yee Yee	s required; che - - - - - - - - - - - - - - - - - - -	ck all that a	apply) Stained Lea c Fauna (B: eposits (B1 gen Sulfide ed Rhizosph ice of Redu it Iron Redu luck Surface (Explain in	aves (B9) L3) 5) Odor (C1) neres on Livir ced Iron (C4 ction in Tilled e (C7) Remarks) 5): 5):	ng Roots (C3)	ill layer. Original hydric layer covered by 16 inch         Secondary Indicators (minimum of two required         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Saturation Visible on Aerial Imagery (C9)         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)         Shallow Aquitard (D3)         FAC-Neutral Test (D5)         Microtopographic Relief (D4)
Type: Depth (in Remarks: of fill mat <b>/ DROL</b> Wetland Primary II Sur Sur Sur Nat Sed Orif Alga Inu Spa Field Obs Surface W Water Tal Saturatior (includes	Indicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4) n Deposits (B5) ndation Visible on arsely Vegetated C servations: Vater Present? ble Present?	oresent. H cators: m of one i 2) 2) 2) 4) Aerial Ima oncave Su Yee Yee Yee Yee	<u>s required; che</u> - - - - - - - - - - - - - - - - - - -	ck all that a	apply) Stained Lea c Fauna (B: eposits (B1 gen Sulfide ed Rhizosph ice of Redu it Iron Redu luck Surface (Explain in epth (inches epth (inches	aves (B9) 13) 5) Odor (C1) heres on Livir ced Iron (C4 ction in Tilled e (C7) Remarks) 5): 5): 6 5): 0	ng Roots (C3) ł) d Soils (C6)	ill layer. Original hydric layer covered by 16 inch         Secondary Indicators (minimum of two required         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Saturation Visible on Aerial Imagery (C9)         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)         Shallow Aquitard (D3)         FAC-Neutral Test (D5)         Microtopographic Relief (D4)         Indicators of         Wetland Hydrology Present?         Yes       No



Photo 21. Wetland 6. Data points 12 and 13. View to the north.



Photo 22. Wetland 6. Data points 12 and 13. View to the west.



Photo 24. Wetland 6. General, view to the north.



Photo 25. Wetland 6. General, view to the south.

				epin Sampling Date: <u>September 25, 2018</u> Sample Point: <u>DP14</u>
				n, Township, Range: Section 4, T118N, R21W
				none): <u>convex</u> Slope (%): < 1%
				-93.348859 Datum: WGS84
Soil Map Unit Name: <u>Seelyeville and Markey soils, depr</u>				
Are climatic hydrologic conditions on the site typical for the				
				nal Circumstances" present? Yes No
Are Vegetation, Soil, or Hydrology	-			
Are Vegetation, Soil, or Hydrology				d, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map s	nowing sa	mpling p		ons, transects, important features, etc.
Hydrophytic Vegetation Present? Yes	No	$\boxtimes$	Is the Sam	-
Hydric Soil Present? Yes 🛛	No		within a W	
Wetland Hydrology Present? Yes 🛛	No		If yes, optio	nal Wetland Side ID:
Remarks: (Explain alternative procedures here or in conditions on the site were within normal range at the site were were were within normal range at the site were were were were were were were we				of the antecedent precipitation indicates the hydrologic fill materials, area is mown regularly.
VEGETATION - Use scientific names of plants	5			
	Absolute	Dominant	Indicator	<b>50/20 Thresholds</b> 20% 50%
Tree Stratum (Plot size:)	% Cover	Species?	Status	Tree Stratum
1.				Sapling/Shrub Stratum
2.				Herb Stratum <u>20</u> <u>50</u>
3.				Woody Vine Stratum
4.				
5.				Number of Dominant Species
		= Total Co	ver	That Are OBL, FACW, or FAC: <u>0</u> (A)
Sapling/Shrub Stratum (Plot size:)				Total Number of Dominant
1.				Species Across All Strata: <u>1</u> (B)
2.				Percent of Dominant Species
3.				That Are OBI, FACW, or FAC: <u>0</u> (A/B) Prevalence Index worksheet:
4.				Total % Cover of. Multiply by:
5.				OBL species          x 1 =
		= Total Co	ver	FACW species x 2 =
Herb Stratum (Plot size: <u>5 feet</u> )				FAC species x 3 =
1. Poa pratensis	70	Х	FACU	FACU species x 4 =
2. Digitaria ischaemum	15		FACU	UPL species x 5 =
3. Elymus repens	<u>10</u> 5		FACU	Column Totals:(A)(B)
4. Trifolium repens	5		FACU	Prevalence Index = B/A =
5.				Hydrophytic Vegetation Indicators:
7.				Rapid Test for Hydrophytic Vegetation
8.				Dominance Test is >50%
9.				Prevalence Index is $\leq 3.0^1$
10.				Morphological Adaptations' (Provide supporting
11.				data in Remarks or on a separate sheet)
12.				Problematic Hydrophytic Vegetation' (Explain)
	100	= Total Co	ver	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Woody Vine Stratum (Plot size:)				Definitions of Vegetation Strata:
1.				<b>Tree</b> – Woody plants 3 in. (7.6 cm) or more in diameter at
2.	-	Tatal Ca		breast height (DBH), regardless of height.
Remarks: (Include photo numbers here or on a separat		<u>= Total Co</u> drophytic v		<b>Sapling/shrub</b> – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
not present.	, ,	. ,	-	Herb – All herbaceous (non-woody) plants, regardless of size,
				and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.
				Hydrophytic Vegetation Present?
				Yes No

epth	Matrix			Redox Fea	-			
nches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-7	10YR 3/1	97	5YR 4/6	3	C	М	Sandy loai	m
7-22	10YR 3/2						Coarse sar	nd With small pebbles
22-24	10YR 2/1						muck	
Гуре: С=	Concentration, D=	Depletion, R	M=Reduced I	/atrix, CS=	Covered o	r Coated Sa	and Grains.	<sup>2</sup> Location: PL=Pore Lining, M=Matrix.
	oil Indicators:			inned Mat				Indicators for Problematic Hydric
Histo				ipped Mati			1400)	2 cm Muck - (A10) (LRR K, L, MLRA 149
	c Epipedon (A2)				(S7) <b>(LRF</b>		-	Coast Prairie Redox (A16) (LRR K, L,
	k Histic (A3)						R, MLRA 149	
	rogen Sulfide (A4)	)				-	1LRA 149B)	Dark Surface (S7) (LRR K, L)
	tified Layers (A5)				/ Mineral (I		K, L)	Polyvalue Below Surface (S8) (LRR K,
Depl	leted Below Dark S	Surface (A11	l) 🔲 Loa	amy Gleye	d Matrix (F	2)		Thin Dark Surface (S9) <b>(LRR K, L)</b>
	k Dark Surface (A		De De	pleted Mat	rix (F3)			Iron-Manganese Masses (F12) (LRR K, L,
	dy Mucky Mineral		🔼 Re	dox Dark S	Surface (F6	5)		Piedmont Floodplain Soils (F19) (MLRA 14
Sanc	dy Gleyed Matrix (	(S4)	De De	pleted Dar	k Surface	(F7)		Mesic Spodic (TA6) <b>(MLRA 144A, 145, 149</b>
Sanc	dy Redox (S5)		🔲 Re	dox Depre	ssions (F8)	1		Red Parent Material (F21)
Indicators	of hydrophytic veg	getation and w	wetland hydrol	ogy must b	e present,	unless distu	urbed or	Very Shallow Dark Surface (TF12)
roblematic	2.							Other (Explain in Remarks)
Restricti	ive Layer (if obse	erved):						
Type:								Hydric Soil Present? 🛛 Yes 🔟 No 🗌
Depth (in	(choc)							
Depui (III	iches):							
	-	present Hyd	ric soils indic	ators Pedo	v Dark Sur	face (E6) i	s satisfied. Fill	material over original muck laver
Remarks:	Hydric soils are p	oresent. Hyd	ric soils indica	ators Redo	x Dark Sur	face (F6) i	s satisfied. Fill	material over original muck layer.
Remarks: YDROL	Hydric soils are p OGY		ric soils indica	ators Redo	x Dark Sur	face (F6) i	s satisfied. Fill	material over original muck layer.
Remarks: YDROL Wetland	Hydric soils are p	cators:				face (F6) i	s satisfied. Fill	material over original muck layer. Secondary Indicators (minimum of two require
Remarks: YDROL Wetland Primary In	Hydric soils are p OGY Hydrology Indiandicators (minimum	cators:	required; chec	k all that a	pply)		s satisfied. Fill	Secondary Indicators (minimum of two require
Remarks: YDROL Wetland Primary II	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1)	cators: m of one is r	equired; chec	k all that a	pply) Stained Lea	aves (B9)	s satisfied. Fill	Secondary Indicators (minimum of two require
Remarks: Y DROL Wetland Primary In Sur Hig	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2	cators: m of one is r	required; chec _[ _[	k all that a Water- Aquatio	pply) Stained Lea : Fauna (B:	aves (B9) 13)	s satisfied. Fill	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10)
Remarks: Y DROL Wetland Primary In Sur Hig Satu	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3)	cators: m of one is r	equired; chec 	k all that a Water- Aquatic Marl Do	pply) Stained Lea : Fauna (B: eposits (B1	aves (B9) 13) 5)	s satisfied. Fill	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16)
Remarks: Y DROL Wetland Primary II Sur Sur Hig Satu War	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1)	<b>cators:</b> m of one is n	equired; chec 	<u>k all that a</u> Water- Aquatic Marl Do Hydrog	pply) Stained Lea Fauna (B: eposits (B1 eposits (B1	aves (B9) 13) 5) Odor (C1)		Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2)
Remarks: Y DROL Wetland Primary II Sur Sur Hig Satu War Sed	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B	<b>cators:</b> m of one is n	equired; chec 	k all that a 	<u>pply)</u> Stained Lea Fauna (B: eposits (B1 en Sulfide ed Rhizosph	aves (B9) 13) 5) Odor (C1) heres on Liv	ving Roots (C3)	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8)
Remarks: Y DROL Wetland Primary In Sur Sur Satu Satu Sed Drif	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3)	<b>cators:</b> <u>m of one is r</u> 2) 22)	equired; chec 	k all that a 	pply) Stained Lea Fauna (B: eposits (B1 en Sulfide ed Rhizosph ce of Redu	aves (B9) I3) 5) Odor (C1) neres on Liv ced Iron (C	ving Roots (C3)	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9)
Remarks: Y DROL Wetland Primary II Sur Kar Kar Kar Kar Kar Kar Kar Ka	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4	<b>cators:</b> <u>m of one is r</u> 2) 22)	equired; chec 	k all that a Water- Kaquatic K	pply) Stained Lea Fauna (B: eposits (B1 len Sulfide ed Rhizosph ce of Redu Iron Redu	aves (B9) 13) 5) Odor (C1) heres on Liv ced Iron (C ction in Till	ving Roots (C3)	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1)
Remarks: Y DROL Wetland Primary II Sur Kig Sur Sur Sur Sur Sur Sur Sur Sur	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B5)	<b>cators:</b> <u>m of one is r</u> 2) 32) 4)	required; chec          	k all that a Water- Aquatio Marl Do Hydrog Oxidize Presen Recent Thin M	pply) Stained Lea Fauna (B: eposits (B1 eposits (B1 ep	aves (B9) 13) 5) Odor (C1) heres on Liv ced Iron (C ction in Till e (C7)	ving Roots (C3)	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2)
Remarks: Y DROL Wetland Primary II Sur Kig Sur Sur Sur Sur Sur Sur Sur Sur	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4	<b>cators:</b> <u>m of one is r</u> 2) 32) 4)	required; chec          	k all that a Water- Aquatio Marl Do Hydrog Oxidize Presen Recent Thin M	pply) Stained Lea Fauna (B: eposits (B1 len Sulfide ed Rhizosph ce of Redu Iron Redu	aves (B9) 13) 5) Odor (C1) heres on Liv ced Iron (C ction in Till e (C7)	ving Roots (C3)	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1)
Remarks: Y DROL Wetland Primary II Sur Sur Hig Sat Wa Sed Drif Alga Iror Inu	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B5)	<b>cators:</b> <u>m of one is r</u> 2) 2) 4) Aerial Image	required; chec 	k all that a Water- Aquatio Marl Do Hydrog Oxidize Presen Recent Thin M	pply) Stained Lea Fauna (B: eposits (B1 eposits (B1 ep	aves (B9) 13) 5) Odor (C1) heres on Liv ced Iron (C ction in Till e (C7)	ving Roots (C3)	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2)
Remarks: Y DROL Wetland Primary II Sur Sur Hig Sat Sed Drif Alga Iror Inu	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B ft Deposits (B3) al Mat or Crust (B4 n Deposits (B5) undation Visible on	<b>cators:</b> <u>m of one is r</u> 2) 2) 4) Aerial Image	required; chec 	k all that a Water- Aquatio Marl Do Hydrog Oxidize Presen Recent Thin M	pply) Stained Lea Fauna (B: eposits (B1 eposits (B1 ep	aves (B9) 13) 5) Odor (C1) heres on Liv ced Iron (C ction in Till e (C7)	ving Roots (C3)	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3)
Remarks: Y DR OL Wetland Primary II Sur Sur Sur Sur Sur Sur Sur Sur	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B ft Deposits (B3) al Mat or Crust (B4 n Deposits (B5) undation Visible on	<b>cators:</b> <u>m of one is r</u> 2) 2) 4) Aerial Image	required; chec 	k all that a Water- Aquatio Marl Do Hydrog Oxidize Presen Recent Thin M	pply) Stained Lea Fauna (B: eposits (B1 eposits (B1 ep	aves (B9) 13) 5) Odor (C1) heres on Liv ced Iron (C ction in Till e (C7)	ving Roots (C3)	Secondary Indicators (minimum of two requires         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Saturation Visible on Aerial Imagery (C9)         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)         Shallow Aquitard (D3)         FAC-Neutral Test (D5)         Microtopographic Relief (D4)
Remarks: Y DROL Wetland Primary II Sur Hig Sat Va Sed Drif Alga Iror Inu Spa Field Ob	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) indation Visible on arsely Vegetated C	<b>cators:</b> <u>m of one is r</u> 2) 2) 4) Aerial Image	required; chec 	k all that a L Water- L Aquatic Marl Do L Hydrog C Oxidize Recent Recent C Thin M Other (	pply) Stained Lea Fauna (B: eposits (B1 eposits (B1 ep	aves (B9) L3) 5) Odor (C1) neres on Liv ced Iron (C ction in Till e (C7) Remarks)	ving Roots (C3)	Secondary Indicators (minimum of two requires Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3) FAC-Neutral Test (D5) Microtopographic Relief (D4)
Remarks: Y DR OL Wetland Primary II Sur Sur Surface V	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) andation Visible on arsely Vegetated Co servations:	<b>cators:</b> <u>m of one is r</u> 2) 22) 4) Aerial Image ioncave Surfa	required; chec 	k all that a Water- Aquatic Marl Do Hydrog Oxidize Recent Recent Other (	pply) Stained Lea Fauna (B: eposits (B1 en Sulfide ed Rhizosph ce of Redu Iron Redu uck Surface Explain in	aves (B9) L3) 5) Odor (C1) heres on Liv ced Iron (C ction in Till e (C7) Remarks)	ving Roots (C3)	Secondary Indicators (minimum of two requires Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3) FAC-Neutral Test (D5) Microtopographic Relief (D4) Indicators of Wetland Hydrology Present?
Remarks: Y DR OL Wetland Primary II Sur Sur Sur Sur Alga Drif Alga Drif Alga Drif Surface V Water Ta	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) indation Visible on arsely Vegetated Co servations: Vater Present?	cators: <u>m of one is r</u> 2) 22) 4) Aerial Image concave Surfa Yes [	equired; chec 	k all that a Water- Aquatic Aquatic Aquatic Aquatic Aquatic Arroy	pply) Stained Lea Fauna (B: eposits (B1 Jen Sulfide ed Rhizosph ce of Redu Iron Redu uck Surface Explain in	aves (B9) 13) 5) Odor (C1) heres on Liv ced Iron (C ction in Till e (C7) Remarks) 5): 5): <u>10</u>	ving Roots (C3)	Secondary Indicators (minimum of two requires Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3) FAC-Neutral Test (D5) Microtopographic Relief (D4)
Remarks: Y DROL Wetland Primary II Sur Sur Sur Sur Field Ob Surface W Water Tal Saturatior (includes	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) indation Visible on arsely Vegetated Co servations: Vater Present? ble Present? n Present? capillary fringe)	cators: <u>m of one is r</u> 2) 32) 4) Aerial Image concave Surfa Yes [ Yes [2 Yes [2 Yes [2	equired; chec 	k all that a Water- Aquatic Aquatic Aquatic Aquatic Aquatic Arrow	pply) Stained Lea Fauna (B: eposits (B1 en Sulfide ed Rhizosph ce of Redu Iron Redu uck Surface (Explain in pth (inches pth (inches	aves (B9) 13) 5) Odor (C1) heres on Liv ced Iron (C ction in Till e (C7) Remarks) 5): 5): 5): 2	ving Roots (C3) (4) ed Soils (C6)	Secondary Indicators (minimum of two required         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Saturation Visible on Aerial Imagery (C9)         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)         Shallow Aquitard (D3)         FAC-Neutral Test (D5)         Microtopographic Relief (D4)         Indicators of         Wetland Hydrology Present?         Yes_N_ No
Remarks: Y DR OL Wetland Primary II Sur Sur Sur Sur Field Ob Surface W Water Tal Saturatior (includes	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) indation Visible on arsely Vegetated Co servations: Vater Present? ble Present? n Present?	cators: <u>m of one is r</u> 2) 32) 4) Aerial Image concave Surfa Yes [ Yes [2 Yes [2 Yes [2	equired; chec 	k all that a Water- Aquatic Aquatic Aquatic Aquatic Arrow Ar	pply) Stained Lea Fauna (B: eposits (B1 en Sulfide ed Rhizosph ce of Redu Iron Redu uck Surface (Explain in pth (inches pth (inches	aves (B9) 13) 5) Odor (C1) heres on Liv ced Iron (C ction in Till e (C7) Remarks) 5): 5): 5): 2	ving Roots (C3) (4) ed Soils (C6)	Secondary Indicators (minimum of two required         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Saturation Visible on Aerial Imagery (C9)         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)         Shallow Aquitard (D3)         FAC-Neutral Test (D5)         Microtopographic Relief (D4)         Indicators of         Wetland Hydrology Present?         Yes_N_ No
Remarks: Y DR OL Wetland Primary II Sur Sur Sur Sur Primary II Sur Sur Sur Surface W Water Tal Saturatior (includes	Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) indation Visible on arsely Vegetated Co servations: Vater Present? ble Present? n Present? capillary fringe)	cators: <u>m of one is r</u> 2) 32) 4) Aerial Image concave Surfa Yes [ Yes [2 Yes [2 Yes [2	equired; chec 	k all that a Water- Aquatic Aquatic Aquatic Aquatic Arrow Ar	pply) Stained Lea Fauna (B: eposits (B1 en Sulfide ed Rhizosph ce of Redu Iron Redu uck Surface (Explain in pth (inches pth (inches	aves (B9) 13) 5) Odor (C1) heres on Liv ced Iron (C ction in Till e (C7) Remarks) 5): 5): 5): 2	ving Roots (C3) (4) ed Soils (C6)	Secondary Indicators (minimum of two required         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Saturation Visible on Aerial Imagery (C9)         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)         Shallow Aquitard (D3)         FAC-Neutral Test (D5)         Microtopographic Relief (D4)         Indicators of         Wetland Hydrology Present?         Yes_N_ No



Photo 23. Wetland 6. Data points 14, 15, and 16. View to the west.



Photo 24. Wetland 6. General, view to the north.



Photo 25. Wetland 6. General, view to the south.

				epin Sampling Date: September 25, 2018
Applicant/Owner: Metropolitan Airports Commission				
Investigator(s): Brauna Hartzell, Mead & Hunt, Inc.				
				none): <u>concave</u> Slope (%): <u>&lt; 1%</u>
			-	-93.349041 Datum: WGS84
Soil Map Unit Name: <u>Seelyeville and Markey soils, depre</u>				
Are climatic hydrologic conditions on the site typical for th				
Are Vegetation, Soil, or Hydrology				nal Circumstances" present? Yes No
Are Vegetation, Soil, or Hydrology			•	d, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map sh	nowing sa	mpling p	oint locatio	ns, transects, important features, etc.
Hydrophytic Vegetation Present? Yes 🖂	No		Is the Sam	-
Hydric Soil Present? Yes 🛛	No		within a W	
Wetland Hydrology Present? Yes 🛛	No			nal Wetland Side ID: <u>6</u>
Remarks: (Explain alternative procedures here or in a conditions on the site were within normal range at the				of the antecedent precipitation indicates the hydrologic nown regularly.
VEGETATION - Use scientific names of plants				
	Absolute	Dominant	Indicator	<b>50/20 Thresholds</b> 20% 50%
Tree Stratum (Plot size:)	% Cover	Species?	Status	Tree Stratum
1.				Sapling/Shrub Stratum
2.				Herb Stratum         20         50           Woody Vine Stratum
3.				Dominance Test worksheet:
4.				
5.				Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A)
		= Total Co	ver	Total Number of Dominant
Sapling/Shrub Stratum (Plot size:)				Species Across All Strata: <u>1</u> (B)
1.				Percent of Dominant Species
2.	-			That Are OBI, FACW, or FAC: <u>0</u> (A/B)
3.				Prevalence Index worksheet:
4.	-			Total % Cover of. Multiply by:
5.		= Total Co		OBL species $\underline{10}$ x 1 = $\underline{10}$
<u>Herb Stratum</u> (Plot size: <u>5 feet</u> )			ver	FACW species x 2 =
1. Digitaria ischaemum	55	х	FACU	FAC species $20$ x 3 = $60$
2. Elymus repens	10	~	FACU	FACU species $\underline{70}$ x 4 = $\underline{280}$
3. Persicaria maculosa	10		FAC	UPL species x 5 =
4. Alopecurus pratensis	10		FAC	Column Totals: <u>100</u> (A) <u>350</u> (B)
5. Echinochloa muricata	10		OBL	Prevalence Index = $B/A = \frac{3.5}{2}$
6. Glechoma hederacea	5		FACU	Hydrophytic Vegetation Indicators:
7.				Rapid Test for Hydrophytic Vegetation
8.				Prevalence Index is $\leq 3.0^1$
9.				Morphological Adaptations' (Provide supporting
10.				data in Remarks or on a separate sheet)
11.				Problematic Hydrophytic Vegetation' (Explain)
12.				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be
	100	= Total Co	ver	present, unless disturbed or problematic.
Woody Vine Stratum (Plot size:)				Definitions of Vegetation Strata:
1. 2.				Tree – Woody plants 3 in. (7.6 cm) or more in diameter at
2.	_	= Total Co	ver	breast height (DBH), regardless of height.
Remarks: (Include photo numbers here or on a separate	e sheet.) Ve	getation m	own	<b>Sapling/shrub</b> – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
regularly. Vegetation obscured by matted, saturated m due to late season and mowing with near total coverag hydrophytic vegetation. Inspection of this area at June	ge by annua	ls indicating	g problematic	<ul> <li>Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.</li> <li>Woody vines – All woody vines greater than 3.28 ft in height.</li> </ul>
consisting of spike rush (Eleocharis sp.), Scirpus atrovi				Hydrophytic Vegetation Present?
hydric soils and wetland hydrology are present.	,	r		Yes No

SO	IL
----	----

epth	Matrix			Red	ox Feat	tures			
nches)	Color (moist)	%	Color (mo	st)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-20	10YR 2/1	100						muck	
20-22	10YR 5/1	100						sand	
Type: C=	Concentration, D=	Depletion,	, RM=Reduce	d Matri	ix, CS=	Covered o	r Coated Sa	and Grains.	<sup>2</sup> Location: PL=Pore Lining, M=Matrix.
Hydric S	oil Indicators:								Indicators for Problematic Hydric
🗌 Histo	osol (A1)			Strippe	d Matri	ix (S6)			2 cm Muck - (A10) (LRR K, L, MLRA 1
🔲 Histi	c Epipedon (A2)			Dark Sı	urface	(S7) <b>(LRR</b>	R, MLRA	149B)	🔲 Coast Prairie Redox (A16) (LRR K, I
D Blac	k Histic (A3)			Polyvalı	ue Belo	w Surface	(S8) <b>(LRR</b> I	R, MLRA 149	3) 5 cm Peat or Mucky Peat (S3) (LRR K,
🔲 Hydi	rogen Sulfide (A4)	)		Thin Da	ark Sur	face (S9)	(LRR R, M	ILRA 149B)	Dark Surface (S7) (LRR K, L)
C Strat	tified Layers (A5)			Loamy	Mucky	Mineral (I	F1) (LRR K	(, L)	Polyvalue Below Surface (S8) (LRR
Depl	leted Below Dark	Surface (A	11) 🔲	Loamy	Gleyed	l Matrix (F	2)		Thin Dark Surface (S9) (LRR K, L)
🔟 Thic	k Dark Surface (A	12)		Deplete	ed Mati	rix (F3)			<u> </u>
C Sand	dy Mucky Mineral	(S1)		Redox	Dark S	urface (F6	<b>)</b>		Piedmont Floodplain Soils (F19) (MLRA
Sanc	dy Gleyed Matrix (	(S4)		Deplete	ed Dark	k Surface (	(F7)		Mesic Spodic (TA6) (MLRA 144A, 145, 1
Sanc	dy Redox (S5)			Redox	Depres	sions (F8)	)		Red Parent Material (F21)
.ndicators	of hydrophytic veg	getation an	d wetland hy	Irology	must b	e present,	unless distu	irbed or	Very Shallow Dark Surface (TF12)
oblematio	2.								Other (Explain in Remarks)
Restricti	ive Layer (if obs	erved):							
Type:									Hydric Soil Present? Yes 🖄 No 🗌
Type: Depth (in Remarks:	iches): : Hydric soils are		ydric soils in	licators	5 Thick	Dark Surfa	ace (A12) i	s satisfied. So	Hydric Soil Present? Yes ⊠ No □
Type: Depth (in Remarks: <b>Y DROL</b>	iches): : Hydric soils are   .OGY	present. H	ydric soils in	licators	5 Thick	Dark Surfi	ace (A12) i	s satisfied. So	
Type: Depth (in Remarks: YDROL Wetland	ches): Hydric soils are OGY Hydrology Indi	present. H icators:					ace (A12) i	s satisfied. So	ils appear undisturbed by filling or grading.
Type: Depth (in Remarks: Y DROL Wetland Primary I	iches): : Hydric soils are   .OGY I Hydrology Indi ndicators (minimu	present. H icators:		neck all	that ap	oply)		s satisfied. So	ils appear undisturbed by filling or grading. Secondary Indicators (minimum of two requi
Type: Depth (in Remarks: <b>/ DROL</b> Wetland Primary I Sur	iches): Hydric soils are OGY Hydrology Indi ndicators (minimu face Water (A1)	present. H icators: Im of one i		neck all	<u>that ar</u> Water-S	oply) Stained Lea	aves (B9)	s satisfied. So	ils appear undisturbed by filling or grading. <u>Secondary Indicators (minimum of two requi</u> Surface Soil Cracks (B6)
Type: Depth (in Remarks: <b>/ DROL</b> <b>Wetland</b> <u>Primary I</u> Sur Hig	iches): : Hydric soils are .OGY I Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2	present. H icators: Im of one i		neck all	<u>that ar</u> Water-S Aquatic	oply) Stained Lea Fauna (B1	aves (B9) 13)	s satisfied. So	ils appear undisturbed by filling or grading. <u>Secondary Indicators (minimum of two requi</u> Surface Soil Cracks (B6) Drainage Patterns (B10)
Type: Depth (in Remarks: <b>/DROL</b> <b>Wetland</b> Primary I Sur Hig Sat	I Hydric soils are OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3)	present. H icators: Im of one i			<u>that ar</u> Water-S Aquatic Marl De	oply) Stained Lea Fauna (B1 posits (B1	aves (B9) 13) 5)	s satisfied. So	ils appear undisturbed by filling or grading.          Secondary Indicators (minimum of two requi
Type: Depth (in Remarks: <b>/DROL</b> Wetland Primary I Sur Sur Hig Sat Wa	I Hydric soils are .OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1)	present. H icators: Im of one i 2)		neck all V <i>F</i>	<u>that ar</u> Water-S Aquatic Marl De Hydroge	oply) Stained Lea Fauna (B1 posits (B1 en Sulfide	aves (B9) 13) 5) Odor (C1)		ils appear undisturbed by filling or grading.  Secondary Indicators (minimum of two requi
Type: Depth (in Remarks: <b>/ DROL</b> <b>Wetland</b> Primary I Sur Hig Sat Wa Sec	iches): .OGY I Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (E	present. H icators: Im of one i 2)		neck all	<u>that ar</u> Water-S Aquatic Marl De Hydroge Oxidized	oply) Stained Lea Fauna (B1 posits (B1 en Sulfide d Rhizosph	aves (B9) 13) 5) Odor (C1) heres on Liv	ing Roots (C3)	ils appear undisturbed by filling or grading.         Secondary Indicators (minimum of two requi
Type: Depth (in <b>Remarks:</b> <b>/ DROL</b> <b>Wetland</b> <b>Primary I</b> <b>Wetland</b> <b>Primary I</b> <b>Wetland</b> <b>DROL</b> <b>Sur</b> <b>Wetland</b> <b>Sur</b> <b>Wetland</b> <b>Wetland</b>	Hydric soils are Hydric soils are OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3)	present. H icators: Im of one i 2) 32)		neck all	<u>that ar</u> Water-S Aquatic Marl De Hydroge Oxidized Presenc	oply) Stained Lea Fauna (B1 posits (B1 en Sulfide d Rhizosph e of Reduc	aves (B9) I3) 5) Odor (C1) ieres on Liv ced Iron (C	ring Roots (C3) 4)	ils appear undisturbed by filling or grading.         Secondary Indicators (minimum of two requination of two requinations)         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Saturation Visible on Aerial Imagery (Carrows)
Type: Depth (in <b>Remarks:</b> <b>/ DROL</b> Wetland Primary I Sur Sur Sur Sur Sur Sur Sur Sur Sur Sur Sur Sur	I Hydric soils are OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B-	present. H icators: Im of one i 2) 32)			<u>that ar</u> Water-S Aquatic Marl De Hydroge Dxidized Presenc Recent	pply) Stained Lea Fauna (B1 posits (B1 en Sulfide d Rhizosph te of Reduc Iron Reduc	aves (B9) 13) 5) Odor (C1) teres on Liv ced Iron (C ction in Tille	ing Roots (C3)	ils appear undisturbed by filling or grading.         Secondary Indicators (minimum of two requination of two requinations)         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Saturation Visible on Aerial Imagery (C         Stunted or Stressed Plants (D1)
Type: Depth (in Remarks: <b>Y DROL</b> Wetland Primary I Sur Hig Sur Sat Va Sec Drif Alg Iron	Additional and the second states and the sec	present. H icators: im of one i 2) 32) 4)	s required; c		<u>that ar</u> Water-S Aquatic Marl De Hydroge Oxidized Presenc Recent Thin Mu	oply) Stained Lea Fauna (B1 posits (B1 en Sulfide d Rhizosph d Rhizosph d Rhizosph d Rhizosph d Rhizosph d Rhizosph d Rhizosph d Rhizosph d Rhizosph	aves (B9) 13) 5) Odor (C1) heres on Liv ced Iron (C ction in Tille e (C7)	ring Roots (C3) 4)	ils appear undisturbed by filling or grading.         Secondary Indicators (minimum of two requination of two requination)         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Saturation Visible on Aerial Imagery (C         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)
Type: Depth (in Remarks: <b>Y DROL</b> Wetland Primary I Sur Hig Sat Sat Sat Sec Drif Iron Iron	Hydric soils are Hydric soils are OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B- n Deposits (B5) undation Visible on	present. H icators: Im of one i 2) 32) 4) Aerial Ima	<u>s required; c</u>		<u>that ar</u> Water-S Aquatic Marl De Hydroge Oxidized Presenc Recent Thin Mu	pply) Stained Lea Fauna (B1 posits (B1 en Sulfide d Rhizosph te of Reduc Iron Reduc	aves (B9) 13) 5) Odor (C1) heres on Liv ced Iron (C ction in Tille e (C7)	ring Roots (C3) 4)	ils appear undisturbed by filling or grading.         Secondary Indicators (minimum of two requination of two requinations)         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Saturation Visible on Aerial Imagery (C         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)         Shallow Aquitard (D3)
Type: Depth (in Remarks: <b>/ DROL</b> Wetland Primary I Sur Hig Sat Sat Sec Crif Alg Irou Inu	Additional and the second states and the sec	present. H icators: Im of one i 2) 32) 4) Aerial Ima	<u>s required; c</u>		<u>that ar</u> Water-S Aquatic Marl De Hydroge Oxidized Presenc Recent Thin Mu	oply) Stained Lea Fauna (B1 posits (B1 en Sulfide d Rhizosph d Rhizosph d Rhizosph d Rhizosph d Rhizosph d Rhizosph d Rhizosph d Rhizosph d Rhizosph	aves (B9) 13) 5) Odor (C1) heres on Liv ced Iron (C ction in Tille e (C7)	ring Roots (C3) 4)	Secondary Indicators (minimum of two requi
Type: Depth (in Remarks: <b>/ DROL</b> Wetland Primary I Sur Hig Sur Hig Sat Sec Orif Iroi Iroi Inu Spa	Arches): Hydric soils are for the solution of the solu	present. H icators: Im of one i 2) 32) 4) Aerial Ima	<u>s required; c</u>		<u>that ar</u> Water-S Aquatic Marl De Hydroge Oxidized Presenc Recent Thin Mu	oply) Stained Lea Fauna (B1 posits (B1 en Sulfide d Rhizosph d Rhizosph d Rhizosph d Rhizosph d Rhizosph d Rhizosph d Rhizosph d Rhizosph d Rhizosph	aves (B9) 13) 5) Odor (C1) heres on Liv ced Iron (C ction in Tille e (C7)	ring Roots (C3) 4)	ils appear undisturbed by filling or grading.         Secondary Indicators (minimum of two requination of two requinations)         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Saturation Visible on Aerial Imagery (C         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)         Shallow Aquitard (D3)
Type: Depth (in Remarks: <b>/ DROL</b> Wetland Primary I Sur Hig Sat Sat Sec Orif Irou Irou Inu Spa	Hydric soils are Hydric soils are OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4) n Deposits (B5) indation Visible on arsely Vegetated C servations:	present. H icators: im of one i 2) 32) 4) Aerial Ima Concave Su	<u>s required; c</u> agery(B7) Irface (B8)		that ar Water-S Aquatic Marl De Hydroge Oxidized Presenc Recent Thin Mu Other (I	pply) Stained Lea Fauna (B1 posits (B1 en Sulfide d Rhizosph d Rhizoph d Rhizoph d Rhizosph d Rhizosph d Rhizoph d Rhizop	aves (B9) I.3) 5) Odor (C1) neres on Liv ced Iron (C ction in Tille e (C7) Remarks)	ring Roots (C3) 4)	Secondary Indicators (minimum of two requi
Type: Depth (in Remarks: <b>Y DROL</b> Wetland Primary I Sur Hig Sat Va Sat Na Sec Drif Alg Irou Inu Spa Field Ob Surface V	Inches): Hydric soils are groups I Hydrology India I Hydrology India Indicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B- n Deposits (B3) al Mat or Crust (B- n Deposits (B5) Indation Visible on arsely Vegetated C Iservations: Vater Present?	present. H icators: im of one i 2) 32) 4) Aerial Ima Concave Su Yes	s required; c agery(B7) Inface (B8)		that ar Water-S Aquatic Marl De Hydroge Oxidized Presenc Recent Thin Mu Other (I	pply) Stained Lea Fauna (B1 posits (B1) en Sulfide d Rhizosph d Rhizoph d Rhizoph d Rhizoph d Rhizoph d Rhizoph d Rhizoph d Rhizoph	aves (B9) 13) 5) Odor (C1) teres on Liv ced Iron (C ction in Tille e (C7) Remarks) 5): <u>1</u>	ring Roots (C3) 4)	ils appear undisturbed by filling or grading.         Secondary Indicators (minimum of two requi         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Saturation Visible on Aerial Imagery (C         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)         Shallow Aquitard (D3)         FAC-Neutral Test (D5)         Microtopographic Relief (D4)
Type: Depth (in Remarks: <b>/ DROL</b> Wetland Primary I Sur Sur Sur Sur Sur Sur Sec Drif Alg Inu Spa Field Ob Surface V Water Ta Saturation	Inches): Hydric soils are I Hydrology India I Hydrology India Indicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B- In Deposits (B5) Indation Visible on arsely Vegetated C servations: Vater Present? ble Present? n Present?	present. H icators: im of one i 2) 32) 4) Aerial Ima Concave Su Yee Yee	s required; c agery(B7) Irface (B8) s ⊠ Nc s ⊠ Nc		that ar Water-S Aquatic Marl De Hydroge Oxidized Presenc Presenc Recent Thin Mu Other (I Dther (I Dep Dep	pply) Stained Lea Fauna (B1 posits (B1 en Sulfide d Rhizosph d Rhizoph d Rhizoph d Rhizosph d Rhizosph d Rhizoph d Rhizop	aves (B9) 13) 5) Odor (C1) teres on Liv ced Iron (C ction in Tille e (C7) Remarks) 5): <u>1</u> 5): <u>1</u>	ring Roots (C3) 4)	ils appear undisturbed by filling or grading.         Secondary Indicators (minimum of two requited in the secondary Indicators (minimum of two requited in the secondary Indicators (B6)         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Saturation Visible on Aerial Imagery (C         Stunted or Stressed Plants (D1)         Second or Stressed Plants (D1)         Shallow Aquitard (D3)         FAC-Neutral Test (D5)         Microtopographic Relief (D4)
Type: Depth (in Remarks: <b>/ DROL</b> Wetland Primary I Sur Hig Sat Sat Sat Na Sec Inu Inu Spa Field Ob Surface V Water Ta Saturation (includes	Inches): Hydric soils are I Hydrology India I Hydrology India Indicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B- n Deposits (B3) al Mat or Crust (B- n Deposits (B5) Indation Visible on arsely Vegetated C servations: Vater Present? ble Present? n Present? n Present? capillary fringe)	present. H icators: im of one i 2) 32) 4) Aerial Ima Concave Su Yes Yes	s required; c agery(B7) Irface (B8) s 🖾 Nc s 🖾 Nc s 🖾 Nc		that ar Water-S Aquatic Marl De Hydroge Oxidized Presenc Cresenc Recent Thin Mu Other (I Dther (I Dep Dep Dep	pply) Stained Lea Fauna (B1 posits (B1) en Sulfide d Rhizosph d Rhizosph d Rhizosph d Rhizosph d Rhizosph ack Surface Explain in I pth (inches oth (inches	aves (B9) 13) 5) Odor (C1) heres on Liv ced Iron (C ction in Tille e (C7) Remarks) 5): <u>1</u> 5): <u>1</u> 5): <u>2</u> 5): <u>0</u>	ring Roots (C3) 4) ed Soils (C6)	ils appear undisturbed by filling or grading.         Secondary Indicators (minimum of two requination of two requinations)         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Saturation Visible on Aerial Imagery (C         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)         Shallow Aquitard (D3)         FAC-Neutral Test (D5)         Microtopographic Relief (D4)         Indicators of         Wetland Hydrology Present?         Yes_N_NO_
Type: Depth (in Remarks: <b>/ DROL</b> Wetland Primary I Sur Hig Sat Sat Sat Na Sec Inu Inu Spa Field Ob Surface V Water Ta Saturation (includes	Inches): Hydric soils are I Hydrology India I Hydrology India Indicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B- In Deposits (B5) Indation Visible on arsely Vegetated C servations: Vater Present? ble Present? n Present?	present. H icators: im of one i 2) 32) 4) Aerial Ima Concave Su Yes Yes	s required; c agery(B7) Irface (B8) s 🖾 Nc s 🖾 Nc s 🖾 Nc		that ar Water-S Aquatic Marl De Hydroge Oxidized Presenc Cresenc Recent Thin Mu Other (I Dther (I Dep Dep Dep	pply) Stained Lea Fauna (B1 posits (B1) en Sulfide d Rhizosph d Rhizosph d Rhizosph d Rhizosph d Rhizosph ack Surface Explain in I pth (inches oth (inches	aves (B9) 13) 5) Odor (C1) heres on Liv ced Iron (C ction in Tille e (C7) Remarks) 5): <u>1</u> 5): <u>1</u> 5): <u>2</u> 5): <u>0</u>	ring Roots (C3) 4) ed Soils (C6)	ils appear undisturbed by filling or grading.         Secondary Indicators (minimum of two requination of two requinations)         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Saturation Visible on Aerial Imagery (C         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)         Shallow Aquitard (D3)         FAC-Neutral Test (D5)         Microtopographic Relief (D4)         Indicators of         Wetland Hydrology Present?         Yes_N_NO_
Type: Depth (in Remarks: <b>/DROL</b> Wetland Primary I Sur Hig Sat Wa Sat Ma Sec Inu Inu Spa Field Ob Surface V Water Ta Saturation (includes Describe	Inches): Hydric soils are OGY Hydrology India Indicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4) indation Visible on arsely Vegetated C servations: Vater Present? ble Present? n Present? n Present? capillary fringe) Recorded Data (st	present. H icators: im of one i 2) 32) 4) Aerial Ima Concave Su Yes Yes Yes	s required; c agery(B7) Inface (B8) s 🖾 No s 🖾 No ge, monitorin	neck all	that ar Water-S Aquatic Marl De Hydroge Oxidized Presenc Recent Thin Mu Other (I Dep Dep Dep	pply) Stained Lea Fauna (B1 posits (B1) en Sulfide d Rhizosph d Rhizosph d Rhizosph d Rhizosph d Rhizosph ack Surface Explain in I photos, pre	aves (B9) I3) 5) Odor (C1) heres on Liv ced Iron (C ction in Tille e (C7) Remarks) 5): <u>1</u> 5): <u>2</u> 5): <u>2</u> evious inspectively	ing Roots (C3) 4) ed Soils (C6)	ils appear undisturbed by filling or grading.         Secondary Indicators (minimum of two requination of two requinations)         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Saturation Visible on Aerial Imagery (C         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)         Shallow Aquitard (D3)         FAC-Neutral Test (D5)         Microtopographic Relief (D4)         Indicators of         Wetland Hydrology Present?         Yes_N_NO_



Photo 23. Wetland 6. Data points 14, 15, and 16. View to the west.



Photo 24. Wetland 6. General, view to the north.



Photo 25. Wetland 6. General, view to the south.

				epin Sampling Date: <u>September 25, 2018</u>		
Applicant/Owner: Metropolitan Airports Commission						
				n, Township, Range: <u>Section 4, T118N, R21W</u>		
				none): <u>convex</u> Slope (%): <u>~ 3%</u>		
			-	-93.349155 Datum: WGS84		
• • • • • •				A) NWI classification:		
Are climatic hydrologic conditions on the site typical for the	his time of ye	ar? Yes 🧕				
Are Vegetation   , Soil  , or Hydrology	significantly	disturbed?	Are "Norr	nal Circumstances" present? Yes No		
Are Vegetation, Soil, or Hydrology	naturally pro	blematic?	(If neede	d, explain any answers in Remarks.)		
SUMMARY OF FINDINGS - Attach site map sl	nowing sa	mpling p	oint locatio	ons, transects, important features, etc.		
Hydrophytic Vegetation Present? Yes	No		Is the Sam	pled Area		
Hydric Soil Present? Yes 🖂	No		within a W	/etland? YesNo		
Wetland Hydrology Present? Yes	No	$\boxtimes$	If yes, optional Wetland Side ID:			
Remarks: (Explain alternative procedures here or in a conditions on the site were within normal range at the				of the antecedent precipitation indicates the hydrologic regularly mowed; soil disturbance due to filling.		
VEGETATION - Use scientific names of plants	;					
	Absolute	Dominant	Indicator	<b>50/20 Thresholds</b> 20% 50%		
Tree Stratum (Plot size:)	% Cover	Species?	Status	Tree Stratum		
1.				Sapling/Shrub Stratum		
2.				Herb Stratum <u>20</u> <u>50</u>		
3.				Woody Vine Stratum		
4.				Dominance Test worksheet:		
5.				Number of Dominant Species		
		= Total Co	ver	That Are OBL, FACW, or FAC: <u>0</u> (A)		
Sapling/Shrub Stratum (Plot size:)				Total Number of Dominant		
1.				Species Across All Strata: <u>2</u> (B)		
2.				Percent of Dominant Species		
3.				That Are OBI, FACW, or FAC: <u>0</u> (A/B)		
4.				Prevalence Index worksheet:		
5.				Total % Cover of. Multiply by:		
		= Total Co	ver	OBL species         x 1 =           FACW species         x 2		
<u>Herb Stratum</u> (Plot size: <u>5 feet</u> )				FACW species x 2 =		
1. Digitaria ischaemum	50	Х	FACU	FAC species $x 3 = $		
2. Elymus repens	30	Х	FACU	FACU species         x 4 =           UPL species         x 5 =		
3. Poa pratensis	15		FACU			
4. Glechoma hederacea	5		FACU	Column Totals: (A) (B) Prevalence Index = B/A =		
5.				Hydrophytic Vegetation Indicators:		
6.				Rapid Test for Hydrophytic Vegetation		
7.				Dominance Test is >50%		
8.				$\square Prevalence Index is \leq 3.0^{1}$		
9.				Morphological Adaptations' (Provide supporting		
10.				data in Remarks or on a separate sheet)		
11.				Problematic Hydrophytic Vegetation' (Explain)		
12.				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be		
	100	= Total Co	ver	present, unless disturbed or problematic.		
Woody Vine Stratum (Plot size:)				Definitions of Vegetation Strata:		
1.				<b>Tree</b> – Woody plants 3 in. (7.6 cm) or more in diameter at		
2.	_			breast height (DBH), regardless of height.		
		= Total Co		Sapling/shrub – Woody plants less than 3 in. DBH and		
Remarks: (Include photo numbers here or on a separate			-	greater than 3.28 ft (1 m) tall. <b>Herb</b> – All herbaceous (non-woody) plants, regardless of size,		
not present. About 35 feet separates this sampling poil on a slight rise near fence about 2 feet higher than we	-	ed wetland	point (DP15)	and woody plants less than 3.28 ft tall. <b>Woody vines</b> – All woody vines greater than 3.28 ft in height.		
				Hydrophytic Vegetation Present?		
				Yes No X		

Depth	cription: (Describe Matrix			Redox F				
(inches)	Color (moist)	%	Color (moi	st) %	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-7	10YR 3/1	97	5YR 3/4	3	С	М	Silt loam	
7-11	10YR 5/1	100					sand	
11-20	10YR 2/1	100					muck	
11 20	101112/1	100					macia	
<sup>1</sup> Type: C=	Concentration, D=	Depletion,	RM=Reduce	d Matrix, C	S=Covered o	r Coated Sar	nd Grains.	<sup>2</sup> Location: PL=Pore Lining, M=Matrix.
Hydric S	oil Indicators:							Indicators for Problematic Hydric
🔲 Histo	osol (A1)			Stripped M	atrix (S6)			2 cm Muck - (A10) (LRR K, L, MLRA 149B
🔲 Histi	c Epipedon (A2)			Dark Surfa	ce (S7) <b>(LRF</b>	R, MLRA	149B)	Coast Prairie Redox (A16) (LRR K, L, R)
Blacl	k Histic (A3)			Polyvalue B	elow Surface	(S8) <b>(LRR R</b>	, MLRA 149 E	3) 5 cm Peat or Mucky Peat (S3) (LRR K, L, R
	rogen Sulfide (A4)	)			Surface (S9)			Dark Surface (S7) (LRR K, L)
	tified Layers (A5)	•			cky Mineral (I	•	-	Polyvalue Below Surface (S8) (LRR K, L
	leted Below Dark			,	yed Matrix (F			Thin Dark Surface (S9) (LRR K, L)
			-			-,		☐ Iron-Manganese Masses (F12) (LRR K, L, R
Thick Dark Surface (A12)  Sandy Mucley Minoral (S1)  Redex Dark Surface (F6)							Piedmont Floodplain Soils (F19) (MLRA 1491	
Sandy Mucky Mineral (S1)     Redox Dark Surface (F6)							Pleamont Ploodplain Soils (P19) (MLRA 1498)	
□ Sandy Gleyed Matrix (S4) □ Depleted Dark Surface (F7)								
☐ Sandy Redox (S5) ☐ Redox Depressions (F8) <sup>3</sup> 1ndicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or							Red Parent Material (F21)	
		getation and	d wetland hyd	trology mus	t be present,	unless distur	bed or	Very Shallow Dark Surface (TF12)
problematic								Dther (Explain in Remarks)
Type:	ve Layer (if obs	ervea):						Hydric Soil Present? Yes 🖄 No 🗌
Depth (in	ches):							
Remarks	Hydric soils are	nresent Hi	udric soils ind	licators Re	dov Dark Sur	face (F6) is	satisfied	
IYDROL		presenting			dox Durk Sur		Satisficat	
Wetland	l Hydrology Indi	icators:						
Primary I	ndicators (minimu	im of one is	s required; cl	neck all tha	t apply)			Secondary Indicators (minimum of two required)
Sur	face Water (A1)			Wate	er-Stained Lea	aves (B9)		Surface Soil Cracks (B6)
Hig	h Water Table (A2	<u>2)</u>		Aqua	atic Fauna (B1	L3)		Drainage Patterns (B10)
Sat	uration (A3)			Marl	Deposits (B1	5)		Moss Trim Lines (B16)
	ter Marks (B1)				ogen Sulfide			Dry-Season Water Table (C2)
 Sed	liment Deposits (B	32)			-	. ,	ng Roots (C3)	Crayfish Burrows (C8)
	t Deposits (B3)	,			ence of Redu			Saturation Visible on Aerial Imagery (C9)
	al Mat or Crust (B4	4)			ent Iron Redu	•	•	Stunted or Stressed Plants (D1)
		7)						Geomorphic Position (D2)
_	n Deposits (B5)		(07)		Muck Surface			
Inundation Visible on Aerial Imagery(B7)     Inundation Visible on Aerial Imagery(B7)     Sparsely Vegetated Concave Surface (B8)								Shallow Aquitard (D3)
Spa	arsely Vegetated C	oncave Sui	rface (B8)					FAC-Neutral Test (D5)
Field Oh								Microtopographic Relief (D4)
	servations:	V	. — N-		Sonth /inst -			Indicators of
C	Vater Present?		S No		Depth (inches			Wetland Hydrology Present?
		Yes	_		Depth (inches Depth (inches			Yes No_⊠_
Water Ta		Vee	N-		JEDULI LINCIA	N.		
Water Tal Saturation	n Present?	Yes	s 🗌 🛛 No					
Water Tal Saturation (includes						-	ctions), if avai	lable:
Water Ta Saturatior (includes Describe	n Present? <u>capillary fringe)</u> Recorded Data (st	tream gaug	ge, monitorin	g, well, aer	al photos, pro	evious inspe		
Water Tal Saturatior (includes Describe	n Present? <u>capillary fringe)</u> Recorded Data (st	tream gaug	ge, monitorin	g, well, aer	al photos, pro	evious inspe		lable: prior and 0.3 inches previous night.



Photo 23. Wetland 6. Data points 14, 15, and 16. View to the west.



Photo 24. Wetland 6. General, view to the north.


Photo 25. Wetland 6. General, view to the south.

			,	epin Sampling Date: <u>September 25, 2018</u> Sample Point: <u>DP17</u>
				, Township, Range: <u>Section 4, T118N, R21W</u>
				none): <u>convex</u> Slope (%): <u>3-4%</u>
				-93.347796 Datum: WGS84
Soil Map Unit Name: <u>Seelyeville and Markey soils, dep</u>				
Are climatic hydrologic conditions on the site typical for t				
Are Vegetation , Soil , or Hydrology				nal Circumstances" present? Yes No
Are Vegetation, Soil, or Hydrology				d, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map s				
Hydrophytic Vegetation Present? Yes	No		Is the Sam	
Hydric Soil Present? Yes	No		within a W	
Wetland Hydrology Present? Yes	No		If yes, optio	nal Wetland Side ID:
Remarks: (Explain alternative procedures here or in conditions on the site were within normal range at t				of the antecedent precipitation indicates the hydrologic lope for runway; vegetation mown regularly.
VEGETATION - Use scientific names of plant			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
	Absolute	Dominant	Indicator	<b>50/20 Thresholds</b> 20% 50%
Tree Stratum (Plot size:)	% Cover		Status	Tree Stratum
1.	70 0010	opecies.	010100	Sapling/Shrub Stratum
2.				Herb Stratum <u>20</u> <u>50</u>
3.				Woody Vine Stratum
4.				Dominance Test worksheet:
5.				Number of Dominant Species
5.		= Total Co	ver	That Are OBL, FACW, or FAC: <u>0</u> (A)
Sapling/Shrub Stratum (Plot size:)				Total Number of Dominant
1.				Species Across All Strata: <u>2</u> (B)
2.				Percent of Dominant Species
3.				That Are OBI, FACW, or FAC: <u>0</u> (A/B)
4.				Prevalence Index worksheet:
5.				Total % Cover of. Multiply by:
		= Total Co	ver	OBL species         x 1 =           FACW species            x 2 =
Herb Stratum (Plot size: <u>5 feet</u> )				FAC species x 2 =
1. Poa pratensis	50	Х	FACU	FACU species $x 4 =$
2. Trifolium repens	20	Х	FACU	UPL species         x 1           x 5 =
3. Taraxacum officinale	15		FACU	Column Totals: (A) (B)
4. Elymus repens	10		FACU	Prevalence Index = $B/A = $
5. Oxalis stricta	5		FACU	Hydrophytic Vegetation Indicators:
6.				Rapid Test for Hydrophytic Vegetation
7.				Dominance Test is >50%
8. 9.				$\square$ Prevalence Index is $\leq 3.0^1$
10.				Morphological Adaptations' (Provide supporting
11.				data in Remarks or on a separate sheet)
12.				Problematic Hydrophytic Vegetation' (Explain)
±	100	= Total Co	ver	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Woody Vine Stratum (Plot size:)				Definitions of Vegetation Strata:
1.				Tree – Woody plants 3 in. (7.6 cm) or more in diameter at
2.		= Total Co		breast height (DBH), regardless of height.
Remarks: (Include photo numbers here or on a separa				<b>Sapling/shrub</b> – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
not present.				<b>Herb</b> – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
				Woody vines – All woody vines greater than 3.28 ft in height.
				Hydrophytic Vegetation Present?
				Yes No _ 🛛 _

epth	Matrix			Redox Fea				
nches)	Color (moist)	%	Color (moist	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-6	10YR 2/1	100					silt	
6-16	10YR 4/1	50	7.5YR 4/4	1	С	М	sand	
	10YR 2/1	50					silt	
16-20	10YR 2/1	95	7.5YR 4/4	5	С	М	sand	
	ĺ							
Type: C=	Concentration, D=	Depletion,	RM=Reduced	Matrix, CS=	Covered o	r Coated Sa	nd Grains.	<sup>2</sup> Location: PL=Pore Lining, M=Matrix.
	oil Indicators:	• •						Indicators for Problematic Hydric
🗌 Histo	osol (A1)		🔲 St	ripped Mat	rix (S6)			2 cm Muck - (A10) (LRR K, L, MLRA 149
🔲 Histi	c Epipedon (A2)			ark Surface	(S7) <b>(LRR</b>	R R, MLRA	149B)	Coast Prairie Redox (A16) (LRR K, L,
Blac	k Histic (A3)		<u> </u>	lyvalue Belo	w Surface	(S8) <b>(LRR R</b>	, MLRA 149 E	3) 5 cm Peat or Mucky Peat (S3) (LRR K, L,
🔲 Hydi	rogen Sulfide (A4)	I	<u>П</u> т	in Dark Su	rface (S9)	(LRR R, M	LRA 149B)	Dark Surface (S7) (LRR K, L)
Strat	tified Layers (A5)			amy Mucky	/ Mineral (F	F1) (LRR K	, L)	Polyvalue Below Surface (S8) (LRR K,
Depl	leted Below Dark S	Surface (A:	l1) 🔲 Lo	amy Gleye	d Matrix (F	2)		Thin Dark Surface (S9) (LRR K, L)
Thic	k Dark Surface (A	12)	D	epleted Mat	rix (F3)			Iron-Manganese Masses (F12) (LRR K, L,
Sand	dy Mucky Mineral	(S1)		dox Dark S	Surface (F6	5)		Piedmont Floodplain Soils (F19) (MLRA 14
Sanc	dy Gleyed Matrix (	S4)	<u> </u>	pleted Dar	k Surface (	(F7)		Mesic Spodic (TA6) <b>(MLRA 144A, 145, 149</b>
Sanc	dy Redox (S5)			dox Depre	ssions (F8)	)		Red Parent Material (F21)
Indicators	of hydrophytic veg	etation and	wetland hydro	logy must t	e present,	unless distur	bed or	Very Shallow Dark Surface (TF12)
roblematic			,	5,	, ,			Other (Explain in Remarks)
Restricti	ve Layer (if obse	erved):						
Type:								Hydric Soil Present? Yes 🔲 No 🖂
Type:								Hydric Soil Present? Yes 🔲 No 🛛
Type: Depth (in	 ches):		Does not me	et hydric s	oil criteria	Soile dietu	rbed due to co	
Type: Depth (in Remarks:	 ches): Hydric soils are r		. Does not me	et hydric s	oil criteria.	Soils distu	rbed due to co	Hydric Soil Present? Yes 🗌 No 🛛
Type: Depth (in Remarks: YDROL	ches): Hydric soils are r	not present	. Does not me	et hydric s	oil criteria.	Soils distu	rbed due to co	
Type: Depth (in Remarks: YDROL Wetland	 ches): Hydric soils are r .OGY Hydrology Indi	not present				Soils distu	rbed due to cc	Instruction of grade slope for runway end.
Type: Depth (in Remarks: YDROL Wetland Primary I	ches): Hydric soils are r .OGY Hydrology India ndicators (minimu	not present	required; che	ck all that a	pply)		rbed due to co	nstruction of grade slope for runway end. Secondary Indicators (minimum of two require
Type: Depth (in Remarks: YDROL Wetland Primary I Sur	ches): Hydric soils are r .OGY Hydrology Indiana ndicators (minimum face Water (A1)	not present cators: m of one is	required; che	ck all that a	pply) Stained Lea	aves (B9)	rbed due to co	nstruction of grade slope for runway end. <u>Secondary Indicators (minimum of two require</u> Surface Soil Cracks (B6)
Type: Depth (in Remarks: Y DROL Wetland Primary I Sur Hig	ches): Hydric soils are r .OGY Hydrology India ndicators (minimu face Water (A1) h Water Table (A2	not present cators: m of one is	required; che	ck all that a	pply) Stained Lea : Fauna (B1	aves (B9) 13)	rbed due to co	Instruction of grade slope for runway end. Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10)
Type: Depth (in Remarks: <b>Y DROL</b> Wetland Primary I Sur Hig Sat	hydric soils are r OGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2 uration (A3)	not present cators: m of one is	required; che  	k all that a Water- Aquatio	pply) Stained Lea : Fauna (B1 eposits (B1	aves (B9) 13) 5)	rbed due to co	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16)
Type: Depth (in Remarks: <b>Y DROL</b> Wetland Primary I Sur Hig Sat Wa	ches): Hydric soils are r .OGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1)	not present cators: m of one is	required; che  	ck all that a Water- Aquatio Marl Do Hydrog	pply) Stained Lea Fauna (B1 eposits (B1 een Sulfide	aves (B9) 13) 5) Odor (C1)		Secondary Indicators (minimum of two require
Type: Depth (in Remarks: Y DROL Wetland Primary I Sur Hig Sat Wa Sec	hydric soils are r OGY Hydrology India ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B	not present cators: m of one is	required; che  	<u>k all that a</u> Water- Aquatio Marl Do Marl Do 	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide ed Rhizosph	aves (B9) L3) 5) Odor (C1) neres on Livi	ng Roots (C3)	Secondary Indicators (minimum of two require
Type: Depth (in <b>Remarks:</b> <b>Y DROL</b> Wetland Primary I Sur Hig Sat Sat Sec Drif	Lydric soils are r DGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) fiment Deposits (B3)	not present cators: m of one is ) 2)	required; che  	ck all that a Water- Aquatic Marl Do Marl Do Hydrog Oxidize Presen	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide ed Rhizosph ce of Reduc	aves (B9) 13) 5) Odor (C1) heres on Livi ced Iron (C4	 ng Roots (C3) })	Secondary Indicators (minimum of two requires
Type: Depth (in <b>Remarks:</b> <b>Y DROL</b> Wetland Primary I Sur Sur Sur Sat Sat Sec Drif Alg.	hydric soils are r OGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4	not present cators: m of one is ) 2)	required; che  	ck all that a       Water-       Aquatic       Marl Dr       Hydrog       Oxidize       Presen       Recent	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide ed Rhizosph ce of Reduc Iron Reduc	aves (B9) I3) 5) Odor (C1) heres on Livi ced Iron (C4 ction in Tille	 ng Roots (C3) })	Secondary Indicators (minimum of two require
Type: Depth (in Remarks: Y DROL Wetland Primary I Sur Hig Sat Sat Sec Orif Alga Iror	hydric soils are r Hydric soils are r OGY Hydrology India I Hydrology India I Hydrology India I Hydrology India I Hydrology India face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B1) al Mat or Crust (B4 n Deposits (B5)	not present cators: m of one is ) 2)	<u>required; che</u>      	k all that a         Water-         Aquation         Marl Do         Hydrog         Oxidized         Presen         Recent         Thin M	pply) Stained Lea Fauna (B1 eposits (B1 ep	aves (B9) 13) 5) Odor (C1) neres on Livi ced Iron (C4 ction in Tille e (C7)	 ng Roots (C3) })	Secondary Indicators (minimum of two requires
Type: Depth (in Remarks: Y DROL Wetland Primary I Sur Hig Sat Sat Sec Orif Alga Iror Inu	hydric soils are r OGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4) n Deposits (B5) ndation Visible on	not present cators: m of one is ) 2) 2) Aerial Imag	required; che          -	k all that a         Water-         Aquation         Marl Do         Hydrog         Oxidized         Presen         Recent         Thin M	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide ed Rhizosph ce of Reduc Iron Reduc	aves (B9) 13) 5) Odor (C1) neres on Livi ced Iron (C4 ction in Tille e (C7)	 ng Roots (C3) })	Secondary Indicators (minimum of two requires
Type: Depth (in Remarks: Y DROL Wetland Primary I Sur Hig Sat Sat Sec Orif Alga Iror Inu	hydric soils are r Hydric soils are r OGY Hydrology India I Hydrology India I Hydrology India I Hydrology India I Hydrology India face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B1) al Mat or Crust (B4 n Deposits (B5)	not present cators: m of one is ) 2) 2) Aerial Imag	required; che          -	k all that a         Water-         Aquation         Marl Do         Hydrog         Oxidized         Presen         Recent         Thin M	pply) Stained Lea Fauna (B1 eposits (B1 ep	aves (B9) 13) 5) Odor (C1) neres on Livi ced Iron (C4 ction in Tille e (C7)	 ng Roots (C3) })	Secondary Indicators (minimum of two requires
Type: Depth (in Remarks: Y DROL Wetland Primary I Sur Hig Sur Hig Sat Sec Drif Alg: Iror Inu Spa	hydric soils are r DG Y Hydrology India ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on arsely Vegetated Co	not present cators: m of one is ) 2) 2) Aerial Imag	required; che          -	k all that a         Water-         Aquation         Marl Do         Hydrog         Oxidized         Presen         Recent         Thin M	pply) Stained Lea Fauna (B1 eposits (B1 ep	aves (B9) 13) 5) Odor (C1) neres on Livi ced Iron (C4 ction in Tille e (C7)	 ng Roots (C3) })	Secondary Indicators (minimum of two requires
Type: Depth (in Remarks: Y DROL Wetland Primary I Sur Hig Sat Va Sec Orif Alga Iror Inu Spa	hydric soils are r OGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4) n Deposits (B5) ndation Visible on arsely Vegetated Ca servations:	not present cators: m of one is ) 2) 4) Aerial Imag oncave Sur	required; che       gery(B7) face (B8)	ck all that a	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide ed Rhizosph ce of Reduc Iron Reduc uck Surface Explain in I	aves (B9) L3) 5) Odor (C1) neres on Livi ced Iron (C4 ction in Tille e (C7) Remarks)	 ng Roots (C3) })	Secondary Indicators (minimum of two requires
Type: Depth (in Remarks: Y DROL Wetland Primary I Sur Hig Sat Na Sec Orif Alg. Irou Irou Inu Spa Field Ob Surface V	hydric soils are r OGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on arsely Vegetated Co servations: Vater Present?	not present cators: m of one is ) ) 2) 4) Aerial Imag oncave Sur Yes	required; che 	ck all that a	pply) Stained Lea Fauna (B1 eposits (B1) en Sulfide ed Rhizosph ce of Reduc Iron Reduc Iron Reduc uck Surface Explain in I	aves (B9) L3) 5) Odor (C1) neres on Livi ced Iron (C4 ction in Tille e (C7) Remarks)	 ng Roots (C3) })	Secondary Indicators (minimum of two requires  Surface Soil Cracks (B6)  Drainage Patterns (B10)  Moss Trim Lines (B16)  Dry-Season Water Table (C2)  Crayfish Burrows (C8)  Saturation Visible on Aerial Imagery (C9)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  FAC-Neutral Test (D5)  Microtopographic Relief (D4)  Indicators of
Type: Depth (in Remarks: Y DROL Wetland Primary I Sur Sur Hig Sat Sat Sat Na Sec Drif Alg. Inu Spa Field Ob Surface V Water Ta	hydric soils are r OGY Hydrology India I Hydrology I Hydrology India I Hydrology I Hydrology	not present cators: m of one is ) 2) Aerial Imag oncave Sur Yes Yes	required; che 	:k all that a	pply) Stained Lea Fauna (B1 eposits (B1 eposits (B1 en Sulfide ed Rhizosph ce of Reduc Iron Reduc Iron Reduc uck Surface Explain in I	aves (B9) I3) 5) Odor (C1) neres on Livi ced Iron (C4 ction in Tille e (C7) Remarks) 5):	 ng Roots (C3) })	Secondary Indicators (minimum of two requires
Type: Depth (in Remarks: Y DROL Wetland Primary I Sur Hig Sat Sat Sat Na Sec Drif Alg. Inu Spa Field Ob Surface V Water Ta Saturation	I Hydric soils are r OGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on arsely Vegetated Co servations: Vater Present? ble Present? n Present?	not present cators: m of one is ) ) 2) 4) Aerial Imag oncave Sur Yes	required; che 	:k all that a	pply) Stained Lea Fauna (B1 eposits (B1) en Sulfide ed Rhizosph ce of Reduc Iron Reduc Iron Reduc uck Surface Explain in I	aves (B9) I3) 5) Odor (C1) neres on Livi ced Iron (C4 ction in Tille e (C7) Remarks) 5):	 ng Roots (C3) })	Secondary Indicators (minimum of two requires  Surface Soil Cracks (B6)  Drainage Patterns (B10)  Moss Trim Lines (B16)  Dry-Season Water Table (C2)  Crayfish Burrows (C8)  Saturation Visible on Aerial Imagery (C9)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  FAC-Neutral Test (D5)  Microtopographic Relief (D4)  Indicators of
Type: Depth (in Remarks: Y DROL Wetland Primary I Sur Hig Sat Hig Sat Na Sec Drif Alg. Iron Inu Spa Field Ob Surface V Water Ta Saturation (includes	ches): Hydric soils are r .OGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4) n Deposits (B3) al Mat or Crust (B4) n Deposits (B5) ndation Visible on arsely Vegetated Co servations: Vater Present? ble Present? n Present? capillary fringe)	not present cators: m of one is ) 2) 4) Aerial Imag oncave Sur Yes Yes Yes Yes	required; che 	Image: A constraint of the second	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide ed Rhizosph ce of Reduc Iron Reduc uck Surface (Explain in I pth (inches pth (inches pth (inches	aves (B9) I3) 5) Odor (C1) neres on Livi ced Iron (C4 ction in Tille e (C7) Remarks) 5): 5): 5):	ng Roots (C3) I) d Soils (C6)	Secondary Indicators (minimum of two requires  Surface Soil Cracks (B6)  Drainage Patterns (B10)  Moss Trim Lines (B16)  Dry-Season Water Table (C2)  Crayfish Burrows (C8)  Saturation Visible on Aerial Imagery (C9)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  FAC-Neutral Test (D5)  Microtopographic Relief (D4)  Indicators of Wetland Hydrology Present? YesNo_⊠_
Type: Depth (in Remarks: Y DROL Wetland Primary I Sur Hig Sat Hig Sat Na Sec Drif Alg. Iron Inu Spa Field Ob Surface V Water Ta Saturation (includes	I Hydric soils are r OGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on arsely Vegetated Co servations: Vater Present? ble Present? n Present?	not present cators: m of one is ) 2) 4) Aerial Imag oncave Sur Yes Yes Yes Yes	required; che 	Image: A constraint of the second	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide ed Rhizosph ce of Reduc Iron Reduc uck Surface (Explain in I pth (inches pth (inches pth (inches	aves (B9) I3) 5) Odor (C1) neres on Livi ced Iron (C4 ction in Tille e (C7) Remarks) 5): 5): 5):	ng Roots (C3) I) d Soils (C6)	Secondary Indicators (minimum of two requires  Surface Soil Cracks (B6)  Drainage Patterns (B10)  Moss Trim Lines (B16)  Dry-Season Water Table (C2)  Crayfish Burrows (C8)  Saturation Visible on Aerial Imagery (C9)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  FAC-Neutral Test (D5)  Microtopographic Relief (D4)  Indicators of Wetland Hydrology Present? YesNo_⊠_
Type: Depth (in Remarks: Y DROL Wetland Primary I Sur Hig Sat Na Sec Orif Alga Iror Iror Iror Inu Spa Field Ob Surface V Water Ta Saturation (includes Describe	ches): Hydric soils are r .OGY Hydrology India ndicators (minimur face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) fiment Deposits (B3) al Mat or Crust (B4) n Deposits (B3) al Mat or Crust (B4) n Deposits (B5) ndation Visible on arsely Vegetated Co servations: Vater Present? ble Present? n Present? n Present? capillary fringe) Recorded Data (st	not present cators: m of one is ) 2) 2) 4) Aerial Imag oncave Sur Yes Yes Yes Yes Yes	required; che	ck all that a         Water-         Aquatic         Marl Dr         Hydrog         Oxidize         Presen         Recent         Thin M         Other (         De         De         De         De         De         Well, aerial	pply) Stained Lea Fauna (B1 eposits (B1) en Sulfide ed Rhizosph ce of Reduc Iron Reduc uck Surface Explain in I pth (inches pth (inches pth (inches	aves (B9) I3) 5) Odor (C1) neres on Livi ced Iron (C4 ction in Tille e (C7) Remarks) 5): 5): evious inspe	ng Roots (C3) H) d Soils (C6) ections), if avai	Secondary Indicators (minimum of two requires  Surface Soil Cracks (B6)  Drainage Patterns (B10)  Moss Trim Lines (B16)  Dry-Season Water Table (C2)  Crayfish Burrows (C8)  Saturation Visible on Aerial Imagery (C9)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  FAC-Neutral Test (D5)  Microtopographic Relief (D4)  Indicators of Wetland Hydrology Present? YesNo_⊠_



Photo 26. Wetland 7. Data points 17, 18, and 19. View to the south.



Photo 27. Wetland 7. General, view to the west.



Photo 28. Wetland 7. General, saturated conditions. View to the west.

				epin Sampling Date: September 25, 2018_
				Sample Point: DP18
				n, Township, Range: <u>Section 4, T118N, R21W</u>
				none): <u>concave</u> Slope (%):         < 1%           -93.347745         Datum:         WGS84
			-	
Soil Map Unit Name: <u>Seelyeville and Markey soils, depr</u>				
Are climatic hydrologic conditions on the site typical for th				
Are Vegetation , Soil , or Hydrology s	-			nal Circumstances" present? Yes No
Are Vegetation, Soil, or Hydrology				d, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map sh	lowing sa	mpling	point locatio	ns, transects, important features, etc.
Hydrophytic Vegetation Present? Yes 🛛	No		Is the Sam	-
Hydric Soil Present? Yes 🛛	No		within a W	
Wetland Hydrology Present? Yes 🛛	No			nal Wetland Side ID: <u>7</u>
Remarks: (Explain alternative procedures here or in a conditions on the site were within normal range at the				of the antecedent precipitation indicates the hydrologic nown regularly.
VEGETATION - Use scientific names of plants				
	Absolute	Dominan	t Indicator	<b>50/20 Thresholds</b> 20% 50%
Tree Stratum (Plot size:)	% Cover	Species?	Status	Tree Stratum
1.				Sapling/Shrub Stratum Herb Stratum 20 50
2.				Herb Stratum         20         50           Woody Vine Stratum
3.				Dominance Test worksheet:
4.				Number of Dominant Species
5.				That Are OBL, FACW, or FAC: <u>3</u> (A)
		= Total Co	over	Total Number of Dominant
Sapling/Shrub Stratum (Plot size:)				Species Across All Strata: <u>4</u> (B)
1.				Percent of Dominant Species
2.				That Are OBI, FACW, or FAC: <u>75</u> (A/B)
4.				Prevalence Index worksheet:
5.				Total % Cover of. Multiply by:
		= Total Co	over	OBL species $\underline{15}$ x 1 = $\underline{15}$
<u>Herb Stratum</u> (Plot size: <u>5 feet</u> )				FACW species $\underline{0}$ x 2 = $\underline{0}$
1. Persicaria maculosa	50	х	FAC	FAC species $\underline{65}$ x 3 = $\underline{195}$
2. Elymus repens	15	Х	FACU	FACU species $20$ x 4 = $80$
3. Alopecurus pratensis	15	Х	FAC	UPL species $\underline{0}$ x 5 = $\underline{0}$ Column Totals: 100 (A) 290 (B)
4. Echinochloa muricata	15	Х	OBL	Column Totals: <u>100</u> (A) <u>290</u> (B) Prevalence Index = $B/A = 2.9$
5. Digitaria ischaemum	5		FACU	Hydrophytic Vegetation Indicators:
6.				Rapid Test for Hydrophytic Vegetation
7.				Dominance Test is >50%
8.				$\square$ Prevalence Index is $\leq 3.0^1$
9.				Morphological Adaptations' (Provide supporting
10.				data in Remarks or on a separate sheet)
11.			-	Problematic Hydrophytic Vegetation' (Explain)
12.	100	= Total Co	over	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Woody Vine Stratum (Plot size:)		-		, ,
1.				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at
2.	-			breast height (DBH), regardless of height.
Remarks: (Include photo numbers here or on a separate		<u>= Total Co</u> drophytic		Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
present. Barnyard grass by mown culms with seed hea			-	<b>Herb</b> – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
				Woody vines – All woody vines greater than 3.28 ft in height.
				Hydrophytic Vegetation Present? Yes <u>No</u> No

	Matrix		1	Redox Fea	tures			
iches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-22	10YR 2/1						Muck	
	Concentration, D=	Doplation [		atrix CC-	Covered o	r Castad Sa	nd Craina	<sup>2</sup> Location: PL=Pore Lining, M=Matrix.
	Soil Indicators:			auix, C3–		Cualeu Sa		Indicators for Problematic Hydric
-	osol (A1)		🗆 Strij	oped Matr	riv (S6)			2 cm Muck - (A10) (LRR K, L, MLRA 149
	ic Epipedon (A2)					R, MLRA	149R)	$\square$ Coast Prairie Redox (A16) <b>(LRR K, L,</b>
			_				-	
	k Histic (A3)						R, MLRA 149 E	
	rogen Sulfide (A4)					-	LRA 149B)	Dark Surface (S7) <b>(LRR K, L)</b>
_	itified Layers (A5)	C				=1) (LRR K	, L)	Polyvalue Below Surface (S8) (LRR K,
	leted Below Dark S		·		d Matrix (F	2)		Thin Dark Surface (S9) (LRR K, L)
	ck Dark Surface (A			leted Mat		、		Iron-Manganese Masses (F12) (LRR K, L,
	dy Mucky Mineral				Surface (F6			Piedmont Floodplain Soils (F19) (MLRA 14
	dy Gleyed Matrix (	S4)			k Surface (			Mesic Spodic (TA6) (MLRA 144A, 145, 149
	dy Redox (S5)				ssions (F8)			Red Parent Material (F21)
	s of hydrophytic veg	etation and	wetland hydrold	ogy must b	e present,	unless distur	bed or	Very Shallow Dark Surface (TF12)
oblematio								Other (Explain in Remarks)
Restricti	ive Layer (if obse	erved):						
Гуре:								Hydric Soil Present? Yes 🛛 No 🗌
Depth (in	nches):							
	,							
		oresent. Hyc	tric soils indicat	tor Thick I	Dark Surfa	ce (A12) is	satisfied. Soils	s appear undisturbed.
	: Hydric soils are p	present. Hyc	tric soils indicat	tor Thick I	Dark Surfa	ce (A12) is	satisfied. Soils	s appear undisturbed.
Remarks:	: Hydric soils are p		tric soils indicat	tor Thick I	Dark Surfa	ce (A12) is	satisfied. Soils	s appear undisturbed.
Remarks: DROL Wetland	: Hydric soils are p	cators:				ce (A12) is	satisfied. Soils	
Remarks: <b>DROL</b> Wetland Primary I	: Hydric soils are p LOGY d Hydrology India	cators:	required; check	all that a			satisfied. Soils	
Remarks: <b>DROL</b> Wetland Primary I Sur	: Hydric soils are p LOGY d Hydrology India Indicators (minimu	cators: m of one is i	required; check	all that a	pply)	aves (B9)	satisfied. Soils	Secondary Indicators (minimum of two require
Remarks: <b>DROL</b> Wetland Primary I D Sur King Hig	Hydric soils are p LOGY Hydrology India Indicators (minimul rface Water (A1) gh Water Table (A2	cators: m of one is i	required; check 	all that a ]_ Water-: ]_ Aquatic	pply) Stained Lea : Fauna (B1	aves (B9) .3)	satisfied. Soils	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10)
Remarks: <b>DROL</b> Wetland Primary I Sur Sat	: Hydric soils are p LOGY Hydrology India Indicators (minimul rface Water (A1)	cators: m of one is i	required; check 	<u>all that a</u> Water-: Aquatic Marl De	pply) Stained Lea Fauna (B1 eposits (B1	aves (B9) 13) 5)	satisfied. Soils	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16)
Remarks:       'DROL       Wetland       Primary I	Hydric soils are p LOGY Hydrology India Indicators (minimur rface Water (A1) gh Water Table (A2 turation (A3) ater Marks (B1)	<b>cators:</b> m of one is r	required; check 	<u>all that a</u> Water-: Aquatic Marl De Hydrog	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide	aves (B9) .3) 5) Odor (C1)		Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2)
Remarks: <b>DROL</b> Wetland Primary I Sur U Hig Sat Wa C Sec	Hydric soils are p LOGY Hydrology India Indicators (minimul rface Water (A1) gh Water Table (A2 turation (A3) ater Marks (B1) diment Deposits (B	<b>cators:</b> m of one is r	required; check	<u>all that a</u> Water- Aquatic Marl De Hydrog	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide d Rhizosph	aves (B9) .3) 5) Odor (C1) ieres on Livi	ng Roots (C3)	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8)
Remarks: <b>DROL</b> Wetland Primary I Sur Sur Sur Sur Sur Sur Sur Sur	Hydric soils are p LOGY Hydrology India Indicators (minimur rface Water (A1) gh Water Table (A2 turation (A3) ater Marks (B1) diment Deposits (B ft Deposits (B3)	cators: m of one is i ) 2)	required; check	all that a Water-: Aquatic Marl De Hydrog Oxidize	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide d Rhizosph ce of Reduc	aves (B9) .3) 5) Odor (C1) ieres on Livi ced Iron (C4	 ng Roots (C3) })	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9)
Remarks: <b>DROL</b> Wetland Primary I Sur U Sur Sur Sur Sur Sur Sur Sur Sur	Hydric soils are p LOGY Hydrology India Indicators (minimul rface Water (A1) gh Water Table (A2 turation (A3) ater Marks (B1) diment Deposits (B ft Deposits (B3) gal Mat or Crust (B4	cators: m of one is i ) 2)	required; check	all that a Water-3 Aquatic Aquatic Aquatic Hydrog Oxidize Recent	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide d Rhizosph ce of Reduc Iron Reduc	aves (B9) .3) 5) Odor (C1) ieres on Livi ced Iron (C4 ction in Tille	 ng Roots (C3) })	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1)
Remarks: <b>DROL</b> Wetland Primary I Sur Hig Sat Wa Sec Drif Alg Iron	Hydric soils are p LOGY Hydrology India Indicators (minimul rface Water (A1) gh Water Table (A2 turation (A3) ater Marks (B1) diment Deposits (B ft Deposits (B3) gal Mat or Crust (B4 on Deposits (B5)	<b>cators:</b> m of one is i ) 2) 4)	required; check	all that a Water-1 Aquatic Aquatic Marl De Hydrog Oxidize Presence Recent Thin Mi	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide d Rhizosph ce of Reduc Iron Reduc uck Surface	aves (B9) .3) Odor (C1) eres on Livi ced Iron (C4 ction in Tille e (C7)	 ng Roots (C3) })	Secondary Indicators (minimum of two require 
Remarks: <b>DROL</b> Wetland Primary I Sur Sur Sur Sur Sur Sur Sur Sur	Hydric soils are p LOGY Hydrology India Indicators (minimur rface Water (A1) gh Water Table (A2 turation (A3) ater Marks (B1) diment Deposits (B ft Deposits (B3) gal Mat or Crust (B4 on Deposits (B5) undation Visible on	cators: <u>m of one is r</u> 2) 4) Aerial Imag	required; check	all that a Water-1 Aquatic Aquatic Marl De Hydrog Oxidize Presence Recent Thin Mi	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide d Rhizosph ce of Reduc Iron Reduc	aves (B9) .3) Odor (C1) eres on Livi ced Iron (C4 ction in Tille e (C7)	 ng Roots (C3) })	Secondary Indicators (minimum of two require 
Remarks: <b>DROL</b> Wetland Primary I Sur Sur Sur Sur Sur Sur Sur Sur	Hydric soils are p LOGY Hydrology India Indicators (minimul rface Water (A1) gh Water Table (A2 turation (A3) ater Marks (B1) diment Deposits (B ft Deposits (B3) gal Mat or Crust (B4 on Deposits (B5)	cators: <u>m of one is r</u> 2) 4) Aerial Imag	required; check	all that a Water-1 Aquatic Aquatic Marl De Hydrog Oxidize Presence Recent Thin Mi	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide d Rhizosph ce of Reduc Iron Reduc uck Surface	aves (B9) .3) Odor (C1) eres on Livi ced Iron (C4 ction in Tille e (C7)	 ng Roots (C3) })	Secondary Indicators (minimum of two require 
Remarks: <b>DROL</b> Wetland Primary I Sur Hig Sat Wa Sec Drif Alg Iron Inu Spa	Hydric soils are p LOGY Hydrology India Indicators (minimul rface Water (A1) gh Water Table (A2 turation (A3) ater Marks (B1) diment Deposits (B ft Deposits (B3) gal Mat or Crust (B4 on Deposits (B5) undation Visible on arsely Vegetated Co	cators: <u>m of one is r</u> 2) 4) Aerial Imag	required; check	all that a Water-1 Aquatic Aquatic Marl De Hydrog Oxidize Presence Recent Thin Mi	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide d Rhizosph ce of Reduc Iron Reduc uck Surface	aves (B9) .3) Odor (C1) eres on Livi ced Iron (C4 ction in Tille e (C7)	 ng Roots (C3) })	Secondary Indicators (minimum of two required 
Remarks: <b>DROL</b> Wetland Primary I Sur Sur Sur Sur Sur Sur Sur Sur	Hydric soils are p LOGY Hydrology India Indicators (minimur rface Water (A1) gh Water Table (A2 turation (A3) ater Marks (B1) diment Deposits (B3) gal Mat or Crust (B4 in Deposits (B5) undation Visible on arsely Vegetated Co pservations:	cators: m of one is i 2) 2) 4) Aerial Imag oncave Surfa	required; check	all that a Water-3 Aquatic Marl De Hydrog Oxidize Presend Recent Chin Mi Other (	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide d Rhizosph ce of Reduc Iron Reduc Iron Reduc uck Surface Explain in I	aves (B9) (3) 5) Odor (C1) teres on Livi ced Iron (C4 ction in Tille e (C7) Remarks)	 ng Roots (C3) })	Secondary Indicators (minimum of two require
Remarks: TOROL Wetland Primary I Sur Sur Sur Sur Sur Sur Sur Sur	Hydric soils are p LOGY Hydrology India Indicators (minimul rface Water (A1) gh Water Table (A2 turation (A3) ater Marks (B1) diment Deposits (B3) gal Mat or Crust (B4 in Deposits (B5) undation Visible on arsely Vegetated Co Deservations: Water Present?	cators: m of one is r 2) 4) Aerial Imag oncave Surfa Yes [	required; check	all that a Water-3 Aquatic Aquatic Arrog Hydrog Oxidize Recent Recent Other ( De	pply) Stained Lea Fauna (B1 eposits (B1) en Sulfide d Rhizosph ce of Reduc Iron Reduc Iron Reduc uck Surface Explain in I	aves (B9) (3) 5) Odor (C1) reres on Livi ced Iron (C4 ction in Tille e (C7) Remarks)	 ng Roots (C3) })	Secondary Indicators (minimum of two requires
Remarks: TOROL Wetland Primary I Sur Sur Sur Alg Drift Alg Drift Alg Drift Sur Field Ob Surface V Water Ta	Hydric soils are p LOGY Hydrology India Indicators (minimul rface Water (A1) gh Water Table (A2 turation (A3) ater Marks (B1) diment Deposits (B3) gal Mat or Crust (B4 on Deposits (B5) undation Visible on arsely Vegetated Co Deservations: Water Present? able Present?	cators: m of one is i 2) 4) Aerial Imag oncave Surfa Yes [ Yes ]	required; check	all that a Water-3 Water-3 Aquatic Aquatic Arroy Hydrog Oxidize Recent Recent Chin Mi Other ( Dep	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide d Rhizosph ce of Reduc Iron Reduc uck Surface Explain in I Explain in I	aves (B9) .3) 5) Odor (C1) eres on Livi ced Iron (C4 ction in Tille c (C7) Remarks) 5): 5):	 ng Roots (C3) })	Secondary Indicators (minimum of two requires Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Stanted or Stressed Plants (D1) Shallow Aquitard (D3) FAC-Neutral Test (D5) Microtopographic Relief (D4) Indicators of Wetland Hydrology Present?
Remarks: TOROL Wetland Primary I Sur Sur Sur Sat Alg Tron Inu Spa Field Ob Surface V Water Ta Saturation	Hydric soils are p LOGY Hydrology India Indicators (minimul rface Water (A1) gh Water Table (A2 turation (A3) ater Marks (B1) diment Deposits (B3) gal Mat or Crust (B4 on Deposits (B5) undation Visible on arsely Vegetated Co Deposits (B5) undation Visible on arsely Vegetated Co Deservations: Water Present? able Present? on Present?	cators: m of one is r 2) 4) Aerial Imag oncave Surfa Yes [	required; check	all that a Water-3 Water-3 Aquatic Aquatic Arroy Hydrog Oxidize Recent Recent Chin Mi Other ( Dep	pply) Stained Lea Fauna (B1 eposits (B1) en Sulfide d Rhizosph ce of Reduc Iron Reduc Iron Reduc uck Surface Explain in I	aves (B9) .3) 5) Odor (C1) eres on Livi ced Iron (C4 ction in Tille c (C7) Remarks) 5): 5):	 ng Roots (C3) })	Secondary Indicators (minimum of two requires Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Stanted or Stressed Plants (D1) Shallow Aquitard (D3) FAC-Neutral Test (D5) Microtopographic Relief (D4) Indicators of Wetland Hydrology Present?
Remarks: TOROL Wetland Primary I Sur Sur Sur Alg Drift Alg Drift Alg Drift Surface V Water Ta Saturation (includes	Hydric soils are p LOGY Hydrology India Indicators (minimul rface Water (A1) gh Water Table (A2 turation (A3) ater Marks (B1) diment Deposits (B3) gal Mat or Crust (B4 on Deposits (B5) undation Visible on arsely Vegetated Co Deservations: Water Present? able Present?	cators: m of one is r 2) 2) Aerial Imag oncave Surfa Yes [ Yes ] Yes [	required; check	all that a Water-3 Aquatic Aquatic Arydrog Hydrog Oxidize Recent Recent Thin Mi Other ( Dep Dep Dep	pply) Stained Lea Fauna (B1 eposits (B1) en Sulfide d Rhizosph ce of Reduc Iron Reduc uck Surface Explain in I pth (inches pth (inches	aves (B9) .3) 5) Odor (C1) teres on Livi ced Iron (C4 ction in Tille c (C7) Remarks) 5): 5): 5): 5):	ng Roots (C3) ł) d Soils (C6)	Secondary Indicators (minimum of two requires         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Saturation Visible on Aerial Imagery (C9)         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)         Shallow Aquitard (D3)         FAC-Neutral Test (D5)         Microtopographic Relief (D4)         Indicators of         Wetland Hydrology Present?         Yes       No
Remarks: TOROL Wetland Primary I Sur Sur Sur Alg Drift Alg Drift Alg Drift Surface V Water Ta Saturation (includes	Hydric soils are p LOGY Hydrology India Indicators (minimul rface Water (A1) gh Water Table (A2 turation (A3) ater Marks (B1) diment Deposits (B3) gal Mat or Crust (B4 in Deposits (B5) undation Visible on arsely Vegetated Co Deservations: Water Present? able Present? in Present? is capillary fringe)	cators: m of one is r 2) 2) Aerial Imag oncave Surfa Yes [ Yes ] Yes [	required; check	all that a Water-3 Aquatic Aquatic Arydrog Hydrog Oxidize Recent Recent Thin Mi Other ( Dep Dep Dep	pply) Stained Lea Fauna (B1 eposits (B1) en Sulfide d Rhizosph ce of Reduc Iron Reduc uck Surface Explain in I pth (inches pth (inches	aves (B9) .3) 5) Odor (C1) teres on Livi ced Iron (C4 ction in Tille c (C7) Remarks) 5): 5): 5): 5):	ng Roots (C3) ł) d Soils (C6)	Secondary Indicators (minimum of two requires         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Saturation Visible on Aerial Imagery (C9)         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)         Shallow Aquitard (D3)         FAC-Neutral Test (D5)         Microtopographic Relief (D4)         Indicators of         Wetland Hydrology Present?         Yes       No
Remarks:         DROL         Vetland         Primary I	: Hydric soils are p LOGY d Hydrology India Indicators (minimu rface Water (A1) gh Water Table (A2 turation (A3) ater Marks (B1) diment Deposits (B3) gal Mat or Crust (B4 in Deposits (B3) gal Mat or Crust (B4 in Deposits (B5) undation Visible on arsely Vegetated Co Deservations: Water Present? able Present? in Present? capillary fringe) Recorded Data (st	cators: m of one is r 2) 2) 4) Aerial Imag oncave Surfa Yes [ Yes ] Yes [ Yes ]	required; check	all that a Water-3 Aquatic Aquatic Arror Hydrog Oxidize Covidize Covidiate C	pply) Stained Lea Fauna (B1 eposits (B1) en Sulfide d Rhizosph ce of Reduc Iron Reduc uck Surface Explain in I pth (inches pth (inches photos, pre	aves (B9) (3) 5) Odor (C1) teres on Livi ced Iron (C4 ction in Tille e (C7) Remarks) 5): (C7) (C4	ng Roots (C3) ) d Soils (C6)	Secondary Indicators (minimum of two requires         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Saturation Visible on Aerial Imagery (C9)         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)         Shallow Aquitard (D3)         FAC-Neutral Test (D5)         Microtopographic Relief (D4)         Indicators of         Wetland Hydrology Present?         Yes       No



Photo 26. Wetland 7. Data points 17, 18, and 19. View to the south.



Photo 27. Wetland 7. General, view to the west.



Photo 28. Wetland 7. General, saturated conditions. View to the west.

				epin Sampling Date: <u>September 25, 2018</u>
				Sample Point: DP19
				n, Township, Range: <u>Section 4, T118N, R21W</u>
				none): <u>none</u> Slope (%): <u>&lt; 1%</u>
			-	-93.347743 Datum: WGS84
				A) NWI classification:
Are climatic hydrologic conditions on the site typical for th				
Are Vegetation, Soil, or Hydrologys	-			nal Circumstances" present? Yes No
Are Vegetation, Soil, or Hydrology r				d, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map sh	lowing sa	mpling p	oint locatio	ons, transects, important features, etc.
Hydrophytic Vegetation Present? Yes	No	$\boxtimes$	Is the Sam	-
Hydric Soil Present? Yes 🖂	No		within a W	
Wetland Hydrology Present? Yes	No	$\boxtimes$	If yes, optio	nal Wetland Side ID:
Remarks: (Explain alternative procedures here or in a conditions on the site were within normal range at th				of the antecedent precipitation indicates the hydrologic nown regularly; likely deposition of fill materials.
VEGETATION - Use scientific names of plants				
	Absolute	Dominant	Indicator	<b>50/20 Thresholds</b> 20% 50%
Tree Stratum (Plot size:)	% Cover	Species?	Status	Tree Stratum
1.				Sapling/Shrub Stratum
2.				Herb Stratum <u>20</u> <u>50</u>
3.				Woody Vine Stratum
4.				
5.				Number of Dominant Species
		= Total Co	ver	That Are OBL, FACW, or FAC: <u>0</u> (A)
Sapling/Shrub Stratum (Plot size:)				Total Number of Dominant
1.				Species Across All Strata: <u>2</u> (B)
2.				Percent of Dominant Species
3.				That Are OBI, FACW, or FAC: <u>0</u> (A/B)
4.				Prevalence Index worksheet: Total % Cover of. Multiply by:
5.				OBL species         x 1 =
		= Total Co	ver	FACW species         x 2 =
Herb Stratum (Plot size: <u>5 feet</u> )				FAC species x 2
1. Poa pratensis	50	Х	FACU	FACU species $x 4 =$
2. Elymus repens	30	Х	FACU	UPL species x 5 =
3. Trifolium repens	10		FACU	Column Totals: (A) (B)
4. Persicaria maculosa	5	-	FAC	Prevalence Index = B/A =
5. Plantago major	2		FACU	Hydrophytic Vegetation Indicators:
6.				Rapid Test for Hydrophytic Vegetation
7.				Dominance Test is >50%
9.				$\square$ Prevalence Index is $\leq 3.0^1$
10.				Morphological Adaptations' (Provide supporting
11.				data in Remarks or on a separate sheet)
12.				Problematic Hydrophytic Vegetation' (Explain)
12.	100	= Total Co	ver	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Woody Vine Stratum (Plot size:)				Definitions of Vegetation Strata:
1.				<b>Tree</b> – Woody plants 3 in. (7.6 cm) or more in diameter at
2.				breast height (DBH), regardless of height.
Remarks: (Include photo numbers here or on a separate	sheet.) Hy	<u>= Total Co</u> drophytic y		Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
not present. Sampling point is about 25 feet from paire similar elevation.			•	<b>Herb</b> – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
				Woody vines – All woody vines greater than 3.28 ft in height.
				Hydrophytic Vegetation Present? Yes <u>No X</u>

epth	Matrix			Redox Fea	atures			
nches)	Color (moist)	%	Color (moist	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-6	10YR 3/2						Sandy loar	n
6-10	10YR 2/2	97	5YR 4/4	3	С	М	Sandy loar	n With pebbles
10-18	10YR 2/1	100					Silt/muck	
ype: C=	Concentration, D=	Depletion,	, RM=Reduced	Matrix, CS=	Covered or	Coated Sa	and Grains.	<sup>2</sup> Location: PL=Pore Lining, M=Matrix.
-	oil Indicators:		_					Indicators for Problematic Hydric
Histo				ripped Mat				2 cm Muck - (A10) (LRR K, L, MLRA 14
	c Epipedon (A2)			ark Surface	(S7) <b>(LRR</b>	R, MLRA	149B)	Coast Prairie Redox (A16) (LRR K, L
Blacl	k Histic (A3)						R, MLRA 149 E	
🔲 Hydr	rogen Sulfide (A4)	)	<u> </u>	in Dark Su	rface (S9)	(LRR R, M	ILRA 149B)	Dark Surface (S7) (LRR K, L)
C Strat	tified Layers (A5)		<u> </u>	amy Mucky	y Mineral (F	1) (LRR I	(, L)	Polyvalue Below Surface (S8) (LRR H
🔲 Depl	leted Below Dark	Surface (A	.11) 🔲 Lo	amy Gleye	d Matrix (F	2)		Thin Dark Surface (S9) (LRR K, L)
Thic	k Dark Surface (A	.12)	<u> </u>	epleted Mat	trix (F3)			Iron-Manganese Masses (F12) (LRR K,
C Sanc	dy Mucky Mineral	(S1)	<u> </u>	dox Dark S	Surface (F6	)		Piedmont Floodplain Soils (F19) (MLRA 1
C Sanc	dy Gleyed Matrix (	(S4)	<u> </u>	epleted Dar	k Surface (	F7)		Mesic Spodic (TA6) (MLRA 144A, 145, 14
C Sanc	dy Redox (S5)		R	dox Depre	ssions (F8)			Red Parent Material (F21)
ndicators	of hydrophytic veg	getation an	d wetland hydro	logy must l	pe present, i	unless distu	urbed or	Very Shallow Dark Surface (TF12)
oblematic					. ,			Other (Explain in Remarks)
Depth (in Remarks: ayer.	ches): Hydric soils are p	present. H	ydric soils indic	ators Redo	x Dark Surf	ace (F6) is	s satisfied. Like	Hydric Soil Present? Yes 🛛 No 🗌
Depth (in Remarks: ayer. Y <b>DROL</b>	ches): Hydric soils are p		ydric soils indic	ators Redo	x Dark Surf	ace (F6) is	s satisfied. Like	
Depth (in Remarks: ayer. DROL Wetland	ches): Hydric soils are p .OGY	cators:				iace (F6) is	s satisfied. Like	
Depth (in Remarks: ayer. DROL Vetland	ches): Hydric soils are p .OGY Hydrology Indi ndicators (minimu	cators:	s required; che	ck all that a	ρρίγ)		s satisfied. Like	ly deposition of fill materials over original muc
Depth (in Remarks: ayer. DROL Vetland Primary In Sur	ches): Hydric soils are p .OGY Hydrology Indi ndicators (minimu face Water (A1)	cators: m of one i	s required; che	ck all that a	pply) Stained Lea	ves (B9)	s satisfied. Like	ly deposition of fill materials over original muc <u>Secondary Indicators (minimum of two requin</u> Surface Soil Cracks (B6)
Depth (in Remarks: ayer. DROL Vetland Primary In D Sur Bur Hig	ches): Hydric soils are p .OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2	cators: m of one i	s required; che 	ck all that a	pply) Stained Lea c Fauna (B1	ves (B9) 3)	s satisfied. Like	ly deposition of fill materials over original muc <u>Secondary Indicators (minimum of two requin</u> Surface Soil Cracks (B6) Drainage Patterns (B10)
Depth (in Lemarks: ayer. DROL Vetland Primary In Sur Hig 	ches): Hydric soils are p .OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3)	cators: m of one i	s required; che 	ck all that a Water- Aquatio Marl D	pply) Stained Lea c Fauna (B1 eposits (B1	ves (B9) 3) 5)	s satisfied. Like	ly deposition of fill materials over original muc <u>Secondary Indicators (minimum of two requin</u> 
Depth (in Remarks: ayer. DROL Wetland Primary Iu Primary Iu Satu Satu Wa	ches): Hydric soils are p .OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1)	<b>cators:</b> <u>m of one i</u>	s required; che 	ck all that a Water- Aquatio Marl D Hydrog	pply) Stained Lea Fauna (B1 eposits (B1 gen Sulfide (	ves (B9) 3) 5) Odor (C1)		ly deposition of fill materials over original muc Secondary Indicators (minimum of two requin Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2)
Depth (in Remarks: ayer. DROL Vetland Primary II C Sur G Sur G Satu G Satu Satu Satu Satu	ches): Hydric soils are p .OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B	<b>cators:</b> <u>m of one i</u>	s required; che 	ck all that a Water- Aquatio Marl D Hydrog	pply) Stained Lea Fauna (B1 eposits (B1 gen Sulfide ( ged Rhizosph	ves (B9) 3) 5) Odor (C1) eres on Liv	ving Roots (C3)	Iv deposition of fill materials over original muc         Secondary Indicators (minimum of two requin
Depth (in temarks: ayer. DROL Vetland Primary I Sur Sat Sat Sat Sat Sed Drif	ches): Hydric soils are p .OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) fiment Deposits (B3)	<b>cators:</b> m of one i 2) 22)	s required; che 	ck all that a Water- Aquatic Marl D Hydrog Oxidize	pply) Stained Lea 5 Fauna (B1 eposits (B1 9 en Sulfide ( 2 d Rhizosph ce of Reduc	ves (B9) 3) 5) Odor (C1) eres on Liv red Iron (C	ving Roots (C3)	Iv deposition of fill materials over original muctors         Secondary Indicators (minimum of two requires)
Depth (in Remarks: ayer. DROL Vetland Primary In Sur Sur Unimary In Sur Sur Sur Sur Sur Sur Sur Sur Sur Sur	ches): Hydric soils are p .OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4	<b>cators:</b> m of one i 2) 22)	s required; che 	ck all that a Water- Aquatio Marl D Hydrog Oxidize Presen Recent	pply) Stained Lea Fauna (B1 eposits (B1 gen Sulfide ( ed Rhizosph ce of Reduc	ves (B9) 3) 5) Ddor (C1) eres on Liv ed Iron (C ttion in Till	ving Roots (C3)	Iv deposition of fill materials over original muc         Secondary Indicators (minimum of two requires
Depth (in Remarks: ayer. <b>DROL</b> Wetland Primary II G Sur G Sur G Satu G Satu Satu Satu Satu Satu Satu Satu Satu	ches): Hydric soils are p .OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B5)	<b>cators:</b> <u>m of one i</u> ?) 2) 32) 4)	<u>s required; che</u>        	Water-       Aquation       Marl D       Hydroon       Oxidized       Presen       Recent       Thin M	pply) Stained Lea Fauna (B1 eposits (B1 gen Sulfide ( ed Rhizosph ce of Reduc Tron Reduc uck Surface	ves (B9) 3) 5) Odor (C1) eres on Liv ed Iron (C tion in Tille (C7)	ving Roots (C3)	Iv deposition of fill materials over original muc         Secondary Indicators (minimum of two requin         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Saturation Visible on Aerial Imagery (C9         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)
Depth (in Remarks: ayer. DROL Vetland Primary II D Sur D Sur G Sur Sur Sur Sur Sur Sur Sur Sur Sur Sur	ches): Hydric soils are p .OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on	<b>cators:</b> <u>m of one i</u> 2) 2) 4) Aerial Ima	<u>s required; che</u>         	Water-       Aquation       Marl D       Hydroon       Oxidized       Presen       Recent       Thin M	pply) Stained Lea Fauna (B1 eposits (B1 gen Sulfide ( ed Rhizosph ce of Reduc	ves (B9) 3) 5) Odor (C1) eres on Liv ed Iron (C tion in Tille (C7)	ving Roots (C3)	Iv deposition of fill materials over original muctors         Secondary Indicators (minimum of two requires)         Image Patterns (B6)         Image Drainage Patterns (B10)         Image Patterns (B10)         Image Dry-Season Water Table (C2)         Image Crayfish Burrows (C8)         Image Saturation Visible on Aerial Imagery (C2)         Image Stunted or Stressed Plants (D1)         Image Comprise Position (D2)         Image Shallow Aquitard (D3)
Pepth (in temarks: ayer. DROL Vetland Primary II 	ches): Hydric soils are p .OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B5)	<b>cators:</b> <u>m of one i</u> 2) 2) 4) Aerial Ima	<u>s required; che</u>         	Water-       Aquation       Marl D       Hydroon       Oxidized       Presen       Recent       Thin M	pply) Stained Lea Fauna (B1 eposits (B1 gen Sulfide ( ed Rhizosph ce of Reduc Tron Reduc uck Surface	ves (B9) 3) 5) Odor (C1) eres on Liv ed Iron (C tion in Tille (C7)	ving Roots (C3)	Iv deposition of fill materials over original muc         Secondary Indicators (minimum of two requires
Depth (in Remarks: ayer. DROL Vetland Primary II Sur Sur Hig Satu Sed Drif Alga Iror Inu Spa	ches): Hydric soils are p .OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on arsely Vegetated C	<b>cators:</b> <u>m of one i</u> 2) 2) 4) Aerial Ima	<u>s required; che</u>         	Water-       Aquation       Marl D       Hydroon       Oxidized       Presen       Recent       Thin M	pply) Stained Lea Fauna (B1 eposits (B1 gen Sulfide ( ed Rhizosph ce of Reduc Tron Reduc uck Surface	ves (B9) 3) 5) Odor (C1) eres on Liv ed Iron (C tion in Tille (C7)	ving Roots (C3)	Iv deposition of fill materials over original muctors         Secondary Indicators (minimum of two requires)         Image Patterns (B6)         Image Drainage Patterns (B10)         Image Patterns (B10)         Image Dry-Season Water Table (C2)         Image Crayfish Burrows (C8)         Image Saturation Visible on Aerial Imagery (C2)         Image Stunted or Stressed Plants (D1)         Image Comprise Position (D2)         Image Shallow Aquitard (D3)
Depth (in Remarks: ayer. <b>DROL</b> Wetland Primary II Sur Hig Sat Sat Sat Sed Iror Inu Spa Field Ob	ches): Hydric soils are p .OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on arsely Vegetated C servations:	cators: <u>m of one i</u> 2) 2) 4) Aerial Ima ioncave Su	s required; che 	ck all that a	pply) Stained Lea Fauna (B1 eposits (B1 gen Sulfide ( ed Rhizosph ce of Reduc ce of Reduc i Iron Reduc uck Surface (Explain in F	ves (B9) 3) 5) Odor (C1) eres on Liv ed Iron (C tion in Till (C7) Remarks)	ving Roots (C3)	Iv deposition of fill materials over original muc         Secondary Indicators (minimum of two requires
Depth (in Remarks: ayer. <b>VDROL</b> <b>Wetland</b> Primary In 	ches): Hydric soils are p .OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on arsely Vegetated C servations: Vater Present?	cators: <u>m of one i</u> 2) 2) 4) Aerial Ima concave Su Yes	s required; che 	ck all that a         Water-         Aquation         Marl D         Hydrog         Oxidize         Presen         Recent         Thin M         Other (	pply) Stained Lea Fauna (B1 eposits (B1 gen Sulfide ( ed Rhizosph ce of Reduc c of Reduc i Iron Reduc uck Surface (Explain in F	ves (B9) 3) 5) Ddor (C1) eres on Liv ed Iron (C tion in Tille (C7) Remarks)	ving Roots (C3)	Iv deposition of fill materials over original muctor         Secondary Indicators (minimum of two requires)         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Saturation Visible on Aerial Imagery (C9)         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)         Shallow Aquitard (D3)         FAC-Neutral Test (D5)         Microtopographic Relief (D4)
Depth (in Remarks: ayer. <b>DROL</b> Wetland Primary In Sur Sur Sur Alga Drif Alga Drif Inu Spa Field Ob Surface W Water Ta	ches): Hydric soils are p .OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on arsely Vegetated C servations: Vater Present?	cators: <u>m of one i</u> 2) 32) 4) Aerial Ima ioncave Su Yes Yes	s required; che 	ck all that a         Water-         Aquation         Marl D         Hydrog         Oxidize         Presen         Recent         Thin M         Other (         Deg         Deg         Deg	pply) Stained Lea Fauna (B1 eposits (B1 gen Sulfide ( ad Rhizosph ce of Reduc Tron Reduc i Iron Reduc uck Surface (Explain in F (Explain in F	ves (B9) 3) 5) Ddor (C1) eres on Liv ed Iron (C tion in Tille (C7) Remarks) ): ):	ving Roots (C3)	Secondary Indicators (minimum of two requin         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Saturation Visible on Aerial Imagery (C9         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)         Shallow Aquitard (D3)         FAC-Neutral Test (D5)         Microtopographic Relief (D4)
Depth (in Remarks: ayer. <b>DROL</b> Wetland Primary II Sur Sur Sau Sau Sau Sau Sau Sau Sau Sau Sau Sau	ches): Hydric soils are p .OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on arsely Vegetated C servations: Vater Present?	cators: <u>m of one i</u> 2) 32) 4) Aerial Ima ioncave Su Yes Yes	s required; che 	ck all that a         Water-         Aquation         Marl D         Hydrog         Oxidize         Presen         Recent         Thin M         Other (         Deg         Deg         Deg	pply) Stained Lea Fauna (B1 eposits (B1 gen Sulfide ( ed Rhizosph ce of Reduc c of Reduc i Iron Reduc uck Surface (Explain in F	ves (B9) 3) 5) Ddor (C1) eres on Liv ed Iron (C tion in Tille (C7) Remarks) ): ):	ving Roots (C3)	Iv deposition of fill materials over original muctor         Secondary Indicators (minimum of two requires)         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)         Shallow Aquitard (D3)         FAC-Neutral Test (D5)         Microtopographic Relief (D4)
Depth (in Remarks: ayer. <b>DROL</b> Wetland Primary In Sur Sur Saur Saur Drif Alga Drif Alga Drif Inu Drif Surface V Water Tal Saturation fincludes	ches): Hydric soils are p .OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on arsely Vegetated C servations: Vater Present? ble Present? n Present?	cators: <u>m of one i</u> 2) 4) Aerial Ima concave Su Yee Yee Yee	s required; che	ck all that a         Water-         Aquation         Marl D         Hydrog         Oxidize         Presen         Recent         Thin M         Other (         Deg         Deg	pply) Stained Lea Fauna (B1 eposits (B1 gen Sulfide ( ed Rhizosph ce of Reduc is Tron Reduc uck Surface (Explain in F pth (inches pth (inches pth (inches	ves (B9) 3) 5) Ddor (C1) eres on Liv ed Iron (C tion in Tille (C7) Remarks) ): ): ):	ving Roots (C3) (4) ed Soils (C6)	Iv deposition of fill materials over original muction         Secondary Indicators (minimum of two requires         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Saturation Visible on Aerial Imagery (C9)         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)         Shallow Aquitard (D3)         FAC-Neutral Test (D5)         Microtopographic Relief (D4)         Indicators of         Wetland Hydrology Present?         Yes       No
Remarks: layer. / DROL Wetland Primary Ii Sur Hig Sat Sat Sed Iror Iror Iron Iron Spa Field Ob Surface V Water Tal Saturation (includes Describe	ches): Hydric soils are p .OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) liment Deposits (B3) al Mat or Crust (B4 n Deposits (B3) al Mat or Crust (B4 n Deposits (B5) ndation Visible on arsely Vegetated C servations: Vater Present? ble Present? n Present? capillary fringe) Recorded Data (st	cators: <u>m of one i</u> 2) (2) (2) (2) (2) (2) (2) (2) (2) (2)	s required; che	ck all that a         Water-         Aquation         Marl D         Hydrog         Oxidize         Presen         Recent         Thin M         Other (         Deg         Deg         Deg         Deg         Mell, aerial	pply) Stained Lea Fauna (B1 eposits (B1 gen Sulfide ( ed Rhizosph ce of Reduc is ron Reduc uck Surface (Explain in F pth (inches pth (inches pth (inches pth (inches pth (inches	ves (B9) 3) 5) Ddor (C1) eres on Liv ed Iron (C tion in Tille (C7) Remarks) ): ): ): ):	ving Roots (C3) (4) ed Soils (C6)	Iv deposition of fill materials over original muction         Secondary Indicators (minimum of two requited in the second secon



Photo 26. Wetland 7. Data points 17, 18, and 19. View to the south.



Photo 27. Wetland 7. General, view to the west.



Photo 28. Wetland 7. General, saturated conditions. View to the west.

				epin Sampling Date: September 25, 2018
Applicant/Owner: Metropolitan Airports Commission				
				n, Township, Range: <u>Section 4, T118N, R21W</u>
				none): <u>none</u> Slope (%): <u>&lt; 1%</u>
			-	<u>-93.347719</u> Datum: <u>WGS84</u>
				A) NWI classification:
Are climatic hydrologic conditions on the site typical for th				
				nal Circumstances" present? Yes No
Are Vegetation, Soil, or Hydrology			•	d, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map sh	nowing sa	mpling p	oint locatio	ons, transects, important features, etc.
Hydrophytic Vegetation Present? Yes	No	$\boxtimes$	Is the Sam	npled Area
Hydric Soil Present? Yes 🛛	No		within a W	
Wetland Hydrology Present? Yes 🛛	No			nal Wetland Side ID:
Remarks: (Explain alternative procedures here or in a conditions on the site were within normal range at the				of the antecedent precipitation indicates the hydrologic nown regularly; likely deposition of fill materials.
VEGETATION - Use scientific names of plants				
	Absolute	Dominant	Indicator	<b>50/20 Thresholds</b> 20% 50%
Tree Stratum (Plot size:)	% Cover	Species?	Status	Tree Stratum
1.				Sapling/Shrub Stratum
2.				Herb Stratum <u>20</u> <u>50</u> Woody Vino Stratum
3.				Woody Vine Stratum
4.				
5.				Number of Dominant Species
		= Total Co	ver	That Are OBL, FACW, or FAC: <u>0</u> (A)
Sapling/Shrub Stratum (Plot size:)				Total Number of Dominant
1.				Species Across All Strata: <u>1</u> (B)
2.				Percent of Dominant Species
3.				That Are OBI, FACW, or FAC: <u>0</u> (A/B) Prevalence Index worksheet:
4.	-			Total % Cover of. Multiply by:
5.	_			OBL species         x 1 =
		= Total Co	ver	FACW species x 2 =
Herb Stratum (Plot size: <u>5 feet</u> )				FAC species x 3 =
1. Poa pratensis	73	X	FACU	FACU species x 4 =
2. Trifolium repens	15		FACU	UPL species x 5 =
3. Elymus repens     4. Taraxacum officinale	10 2		FACU FACU	Column Totals: (A) (B)
5.	2		FACU	Prevalence Index = B/A =
6.				Hydrophytic Vegetation Indicators:
7.				Rapid Test for Hydrophytic Vegetation
8.				Dominance Test is >50%
9.			-	Prevalence Index is $\leq 3.0^1$
10.				Morphological Adaptations' (Provide supporting
11.				data in Remarks or on a separate sheet)
12.	-			Problematic Hydrophytic Vegetation' (Explain)
	100	= Total Co	ver	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Woody Vine Stratum (Plot size:)				Definitions of Vegetation Strata:
1.				<b>Tree</b> – Woody plants 3 in. (7.6 cm) or more in diameter at
2.		= Total Co	ver	breast height (DBH), regardless of height.
Remarks: (Include photo numbers here or on a separate				<b>Sapling/shrub</b> – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
not present.				Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.
				Hydrophytic Vegetation Present?
				Yes No

achae) Color (moiet)		Reut	ox Features			
nches) Color (moist)	% Color (	moist)	% Тур	e <sup>1</sup> Loc <sup>2</sup>	Texture	Remarks
0-6 10YR 3/2	100				Sandy loan	1
6-10 10YR 2/2	97 5YR	4/4	3 C	М	Sandy loan	n With pebbles
10-18 10YR 2/1	100				Silt/muck	
Type: C=Concentration, D=De	epletion, RM=Red	uced Matrix	k, CS=Covere	d or Coated Sa	and Grains.	<sup>2</sup> Location: PL=Pore Lining, M=Matrix.
Hydric Soil Indicators:						Indicators for Problematic Hydric
Histosol (A1)	1	Stripped	d Matrix (S6)			2 cm Muck - (A10) (LRR K, L, MLRA 14
Histic Epipedon (A2)	1	Dark Su	urface (S7) <b>(I</b>	.RR R, MLRA	149B)	🔲 Coast Prairie Redox (A16) (LRR K, L,
Black Histic (A3)	1	Polyvalu	e Below Surfa	ace (S8) <b>(LRR</b>	R, MLRA 149 B	) 5 cm Peat or Mucky Peat (S3) (LRR K, L,
Hydrogen Sulfide (A4)	1	Thin Da	ork Surface (S	69) <b>(LRR R, M</b>	ILRA 149B)	Dark Surface (S7) (LRR K, L)
Stratified Layers (A5)	1	Loamy	Mucky Miner	al (F1) <b>(LRR H</b>	(, L)	Polyvalue Below Surface (S8) (LRR K,
Depleted Below Dark Su			Gleyed Matrix			Thin Dark Surface (S9) (LRR K, L)
Thick Dark Surface (A12	. ,		d Matrix (F3)			Iron-Manganese Masses (F12) (LRR K, L,
Sandy Mucky Mineral (S	· _		Dark Surface			Piedmont Floodplain Soils (F19) (MLRA 14
Sandy Gleyed Matrix (S4			d Dark Surfa			Mesic Spodic (TA6) (MLRA 144A, 145, 149
Sandy Redox (S5)			Depressions (			Red Parent Material (F21)
Indicators of hydrophytic veget					irbed or	Very Shallow Dark Surface (TF12)
roblematic.		nyarology i				$\square \text{ Other (Explain in Remarks)}$
Restrictive Layer (if observ	ved):					<u> </u>
Гуре:	,-					Hydric Soil Present? Yes 🖂 No 🗌
Depth (inches):						,
Remarks: Hydric soils are pre layer.	esent. Hydric soils	indicators	Redox Dark	Surface (F6) is	s satisfied. Likel	y deposition of fill materials over original muck
YDROLOGY Wetland Hydrology Indica						
Primary Indicators (minimum		. chock all	that apply)			Secondary Indicators (minimum of two require
Prindry Indicators (Ininininum		; CHECK all	<u>ullat apply)</u>			Secondary indicators (minimum of two require
				(50)		
Surface Water (A1)			Vater-Stained	. ,		Surface Soil Cracks (B6)
High Water Table (A2)		_ <u> </u>	quatic Fauna	(B13)		Surface Soil Cracks (B6) Drainage Patterns (B10)
High Water Table (A2)		A	quatic Fauna 1arl Deposits	(B13) (B15)		Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16)
High Water Table (A2) Saturation (A3) Water Marks (B1)		A M H	quatic Fauna 1arl Deposits Iydrogen Sulf	(B13) (B15) ide Odor (C1)		<ul> <li>Surface Soil Cracks (B6)</li> <li>Drainage Patterns (B10)</li> <li>Moss Trim Lines (B16)</li> <li>Dry-Season Water Table (C2)</li> </ul>
High Water Table (A2)			quatic Fauna 1arl Deposits Iydrogen Sulf Dxidized Rhizc	(B13) (B15) ide Odor (C1) ispheres on Liv	ring Roots (C3)	Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16)
High Water Table (A2) Saturation (A3) Water Marks (B1)			quatic Fauna 1arl Deposits Iydrogen Sulf Dxidized Rhizc	(B13) (B15) ide Odor (C1)		<ul> <li>Surface Soil Cracks (B6)</li> <li>Drainage Patterns (B10)</li> <li>Moss Trim Lines (B16)</li> <li>Dry-Season Water Table (C2)</li> <li>Crayfish Burrows (C8)</li> </ul>
High Water Table (A2) Saturation (A3) U Water Marks (B1) Sediment Deposits (B2)		A M H C P	quatic Fauna 1arl Deposits lydrogen Sulf Dxidized Rhizc tresence of Re	(B13) (B15) ide Odor (C1) ispheres on Liv	4)	<ul> <li>Surface Soil Cracks (B6)</li> <li>Drainage Patterns (B10)</li> <li>Moss Trim Lines (B16)</li> <li>Dry-Season Water Table (C2)</li> <li>Crayfish Burrows (C8)</li> </ul>
High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3)			quatic Fauna 1arl Deposits lydrogen Sulf Dxidized Rhizc tresence of Re	(B13) (B15) ide Odor (C1) spheres on Liv educed Iron (C eduction in Tille	4)	<ul> <li>Surface Soil Cracks (B6)</li> <li>Drainage Patterns (B10)</li> <li>Moss Trim Lines (B16)</li> <li>Dry-Season Water Table (C2)</li> <li>Crayfish Burrows (C8)</li> <li>Saturation Visible on Aerial Imagery (C9)</li> </ul>
High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4)			quatic Fauna Iarl Deposits lydrogen Sulf Dxidized Rhizc Presence of Re Recent Iron Re	(B13) (B15) ide Odor (C1) ispheres on Liv educed Iron (C eduction in Tille face (C7)	4)	<ul> <li>Surface Soil Cracks (B6)</li> <li>Drainage Patterns (B10)</li> <li>Moss Trim Lines (B16)</li> <li>Dry-Season Water Table (C2)</li> <li>Crayfish Burrows (C8)</li> <li>Saturation Visible on Aerial Imagery (C9)</li> <li>Stunted or Stressed Plants (D1)</li> </ul>
<ul> <li>High Water Table (A2)</li> <li>Saturation (A3)</li> <li>Water Marks (B1)</li> <li>Sediment Deposits (B2)</li> <li>Drift Deposits (B3)</li> <li>Algal Mat or Crust (B4)</li> <li>Iron Deposits (B5)</li> </ul>	erial Imagery(B7)		quatic Fauna Iarl Deposits lydrogen Sulf Dxidized Rhizc resence of Re Recent Iron Re Thin Muck Sur	(B13) (B15) ide Odor (C1) ispheres on Liv educed Iron (C eduction in Tille face (C7)	4)	<ul> <li>Surface Soil Cracks (B6)</li> <li>Drainage Patterns (B10)</li> <li>Moss Trim Lines (B16)</li> <li>Dry-Season Water Table (C2)</li> <li>Crayfish Burrows (C8)</li> <li>Saturation Visible on Aerial Imagery (C9)</li> <li>Stunted or Stressed Plants (D1)</li> <li>Geomorphic Position (D2)</li> </ul>
High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Ae	erial Imagery(B7)		quatic Fauna Iarl Deposits lydrogen Sulf Dxidized Rhizc resence of Re Recent Iron Re Thin Muck Sur	(B13) (B15) ide Odor (C1) ispheres on Liv educed Iron (C eduction in Tille face (C7)	4)	<ul> <li>Surface Soil Cracks (B6)</li> <li>Drainage Patterns (B10)</li> <li>Moss Trim Lines (B16)</li> <li>Dry-Season Water Table (C2)</li> <li>Crayfish Burrows (C8)</li> <li>Saturation Visible on Aerial Imagery (C9)</li> <li>Stunted or Stressed Plants (D1)</li> <li>Geomorphic Position (D2)</li> <li>Shallow Aquitard (D3)</li> </ul>
<ul> <li>High Water Table (A2)</li> <li>Saturation (A3)</li> <li>Water Marks (B1)</li> <li>Sediment Deposits (B2)</li> <li>Drift Deposits (B3)</li> <li>Algal Mat or Crust (B4)</li> <li>Iron Deposits (B5)</li> <li>Inundation Visible on Ae</li> <li>Sparsely Vegetated Con</li> </ul>	erial Imagery(B7)		quatic Fauna Iarl Deposits lydrogen Sulf Dxidized Rhizc resence of Re Recent Iron Re Thin Muck Sur	(B13) (B15) ide Odor (C1) ispheres on Liv educed Iron (C eduction in Tille face (C7)	4)	<ul> <li>Surface Soil Cracks (B6)</li> <li>Drainage Patterns (B10)</li> <li>Moss Trim Lines (B16)</li> <li>Dry-Season Water Table (C2)</li> <li>Crayfish Burrows (C8)</li> <li>Saturation Visible on Aerial Imagery (C9)</li> <li>Stunted or Stressed Plants (D1)</li> <li>Geomorphic Position (D2)</li> <li>Shallow Aquitard (D3)</li> <li>FAC-Neutral Test (D5)</li> <li>Microtopographic Relief (D4)</li> </ul>
High Water Table (A2)         Saturation (A3)         Water Marks (B1)         Sediment Deposits (B2)         Drift Deposits (B3)         Algal Mat or Crust (B4)         Iron Deposits (B5)         Inundation Visible on Ae	erial Imagery(B7) ncave Surface (B8)		quatic Fauna Iarl Deposits lydrogen Sulf Dxidized Rhizc resence of Re Recent Iron Re Thin Muck Sur	(B13) (B15) ide Odor (C1) spheres on Liv educed Iron (C eduction in Tille face (C7) in Remarks)	4)	Surface Soil Cracks (B6)     Drainage Patterns (B10)     Moss Trim Lines (B16)     Dry-Season Water Table (C2)     Crayfish Burrows (C8)     Saturation Visible on Aerial Imagery (C9)     Stunted or Stressed Plants (D1)     Geomorphic Position (D2)     Shallow Aquitard (D3)     FAC-Neutral Test (D5)     Microtopographic Relief (D4)  Indicators of
High Water Table (A2)         Saturation (A3)         Water Marks (B1)         Sediment Deposits (B2)         Drift Deposits (B3)         Algal Mat or Crust (B4)         Iron Deposits (B5)         Inundation Visible on Ae         Sparsely Vegetated Con	erial Imagery(B7) ncave Surface (B8) Yes 🗌		quatic Fauna Iarl Deposits Hydrogen Sulf Dxidized Rhizc Presence of Re Recent Iron Re Chin Muck Sur Dther (Explain	(B13) (B15) ide Odor (C1) spheres on Liv educed Iron (C eduction in Tille face (C7) in Remarks)	4)	Surface Soil Cracks (B6)     Drainage Patterns (B10)     Moss Trim Lines (B16)     Dry-Season Water Table (C2)     Crayfish Burrows (C8)     Saturation Visible on Aerial Imagery (C9)     Stunted or Stressed Plants (D1)     Geomorphic Position (D2)     Shallow Aquitard (D3)     FAC-Neutral Test (D5)     Microtopographic Relief (D4)  Indicators of Wetland Hydrology Present?
High Water Table (A2)         Saturation (A3)         Water Marks (B1)         Sediment Deposits (B2)         Drift Deposits (B3)         Algal Mat or Crust (B4)         Iron Deposits (B5)         Inundation Visible on Ae         Sparsely Vegetated Con         Field Observations:         Surface Water Present?         Water Table Present?         Saturation Present?	erial Imagery(B7) ncave Surface (B8) Yes □ Yes ⊠		Aquatic Fauna Arl Deposits Hydrogen Sulf Dxidized Rhizc Presence of Re Recent Iron Re Chin Muck Sur Dther (Explain Dther (Explain	(B13) (B15) ide Odor (C1) spheres on Liv educed Iron (C eduction in Tille face (C7) in Remarks) thes): thes):	4)	<ul> <li>Surface Soil Cracks (B6)</li> <li>Drainage Patterns (B10)</li> <li>Moss Trim Lines (B16)</li> <li>Dry-Season Water Table (C2)</li> <li>Crayfish Burrows (C8)</li> <li>Saturation Visible on Aerial Imagery (C9)</li> <li>Stunted or Stressed Plants (D1)</li> <li>Geomorphic Position (D2)</li> <li>Shallow Aquitard (D3)</li> <li>FAC-Neutral Test (D5)</li> <li>Microtopographic Relief (D4)</li> </ul>
High Water Table (A2)         Saturation (A3)         Water Marks (B1)         Sediment Deposits (B2)         Drift Deposits (B3)         Algal Mat or Crust (B4)         Iron Deposits (B5)         Inundation Visible on Ae         Sparsely Vegetated Con         Field Observations:         Surface Water Present?         Water Table Present?         Saturation Present?         Saturation Present?         (includes capillary fringe)	erial Imagery(B7) ncave Surface (B8) Yes □ Yes ⊠ Yes ⊠ Yes ⊠		quatic Fauna Iarl Deposits lydrogen Sulf Dxidized Rhizc resence of Re Recent Iron Re Chin Muck Sur Other (Explain Depth (inc Depth (inc Depth (inc	(B13) (B15) ide Odor (C1) spheres on Liv educed Iron (C eduction in Tille face (C7) in Remarks) thes): thes):	4) ed Soils (C6)	<ul> <li>Surface Soil Cracks (B6)</li> <li>Drainage Patterns (B10)</li> <li>Moss Trim Lines (B16)</li> <li>Dry-Season Water Table (C2)</li> <li>Crayfish Burrows (C8)</li> <li>Saturation Visible on Aerial Imagery (C9)</li> <li>Stunted or Stressed Plants (D1)</li> <li>Geomorphic Position (D2)</li> <li>Shallow Aquitard (D3)</li> <li>FAC-Neutral Test (D5)</li> <li>Microtopographic Relief (D4)</li> </ul> Indicators of Wetland Hydrology Present? Yes No
High Water Table (A2)         Saturation (A3)         Water Marks (B1)         Sediment Deposits (B2)         Drift Deposits (B3)         Algal Mat or Crust (B4)         Iron Deposits (B5)         Inundation Visible on Act         Sparsely Vegetated Con	erial Imagery(B7) ncave Surface (B8) Yes □ Yes ⊠ Yes ⊠ Yes ⊠		quatic Fauna Iarl Deposits lydrogen Sulf Dxidized Rhizc resence of Re Recent Iron Re Chin Muck Sur Other (Explain Depth (inc Depth (inc Depth (inc	(B13) (B15) ide Odor (C1) spheres on Liv educed Iron (C eduction in Tille face (C7) in Remarks) thes): thes):	4) ed Soils (C6)	<ul> <li>Surface Soil Cracks (B6)</li> <li>Drainage Patterns (B10)</li> <li>Moss Trim Lines (B16)</li> <li>Dry-Season Water Table (C2)</li> <li>Crayfish Burrows (C8)</li> <li>Saturation Visible on Aerial Imagery (C9)</li> <li>Stunted or Stressed Plants (D1)</li> <li>Geomorphic Position (D2)</li> <li>Shallow Aquitard (D3)</li> <li>FAC-Neutral Test (D5)</li> <li>Microtopographic Relief (D4)</li> </ul> Indicators of Wetland Hydrology Present? Yes No
High Water Table (A2)  Saturation (A3)  Sediment Deposits (B1)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Ae  Sparsely Vegetated Con  Field Observations:  Surface Water Present?  Mater Table Present?  Saturation Present?  Cincludes capillary fringe)	erial Imagery(B7) ncave Surface (B8) Yes Yes Yes Yes am gauge, monito	A M H C P R T C C	Aquatic Fauna Arl Deposits Hydrogen Sulf Dxidized Rhizc Presence of Re Recent Iron Re Thin Muck Sur Dther (Explain Depth (inc Depth (inc Depth (inc aerial photos)	(B13) (B15) ide Odor (C1) spheres on Liv educed Iron (C eduction in Tille face (C7) in Remarks) thes): thes): 10 thes): 2 , previous inspe	4) ed Soils (C6) ections), if availa	Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3) FAC-Neutral Test (D5) Microtopographic Relief (D4) Indicators of Wetland Hydrology Present? Yes No



Photo 26. Wetland 7. Data points 17 and 20. View to the south.

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				epin Sampling Date: <u>September 26, 2018</u>
				Sample Point: <u>DP21</u>
				n, Township, Range: <u>Section 4, T118N, R21W</u>
				none): <u>none</u> Slope (%): <u>&lt; 1%</u>
			-	-93.347533 Datum: WGS84
				A) NWI classification:
Are climatic hydrologic conditions on the site typical for th				
Are Vegetation X, Soil X, or Hydrology S				nal Circumstances" present? Yes No
Are Vegetation, Soil, or Hydrology				d, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map sh	nowing sa	mpling p	oint locatio	ons, transects, important features, etc.
Hydrophytic Vegetation Present? Yes	No	$\boxtimes$	Is the Sam	-
Hydric Soil Present? Yes 🛛	No		within a W	
Wetland Hydrology Present? Yes	No	$\boxtimes$	If yes, optio	nal Wetland Side ID:
Remarks: (Explain alternative procedures here or in a conditions on the site were within normal range at the				of the antecedent precipitation indicates the hydrologic nown regularly; likely deposition of fill materials.
VEGETATION - Use scientific names of plants				
	Absolute	Dominant	Indicator	<b>50/20 Thresholds</b> 20% 50%
Tree Stratum (Plot size:)	% Cover	Species?	Status	Tree Stratum
1.				Sapling/Shrub Stratum
2.				Herb Stratum <u>20</u> <u>50</u>
3.				Woody Vine Stratum
4.				
5.	_			Number of Dominant Species
		= Total Co	ver	That Are OBL, FACW, or FAC: <u>0</u> (A)
Sapling/Shrub Stratum (Plot size:)				Total Number of Dominant
1.				Species Across All Strata: <u>1</u> (B)
2.				Percent of Dominant Species
3.				That Are OBI, FACW, or FAC: <u>0</u> (A/B)       Prevalence Index worksheet:
4.				Total % Cover of. Multiply by:
5.	_			OBL species         x 1 =
		= Total Co	ver	FACW species         x 1 =           x 2 =         x 2 =
Herb Stratum (Plot size: <u>5 feet</u> )				FAC species x 2
1. Elymus repens	75	Х	FACU	FACU species $x 4 =$
2. Taraxacum officinale	10	-	FACU	UPL species x 5 =
3. Poa pratensis	10		FACU	Column Totals: (A) (B)
4. Trifolium repens	5		FACU	Prevalence Index = $B/A = $
5.	_			Hydrophytic Vegetation Indicators:
6.				Rapid Test for Hydrophytic Vegetation
7.				Dominance Test is >50%
9.				$\square$ Prevalence Index is $\leq 3.0^1$
10.				Morphological Adaptations' (Provide supporting
11				data in Remarks or on a separate sheet)
12.				Problematic Hydrophytic Vegetation' (Explain)
		= Total Co	ver	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Woody Vine Stratum (Plot size:)				Definitions of Vegetation Strata:
1. 2.				Tree – Woody plants 3 in. (7.6 cm) or more in diameter at
2.	_	= Total Co		breast height (DBH), regardless of height.
Remarks: (Include photo numbers here or on a separate				<b>Sapling/shrub</b> – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
not present. Also present in in general vicinity shepher			-	Herb – All herbaceous (non-woody) plants, regardless of size,
FACU) and plantain (Plantago major: FACU).	·			and woody plants less than 3.28 ft tall. <b>Woody vines</b> – All woody vines greater than 3.28 ft in height.
				Hydrophytic Vegetation Present?
				Yes No

Depth	Matrix		г	Redox Fea				
inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-7	10YR 3/2	97	5YR 3/4	3	С	М	Sandy loam	
7-16	10YR 2/1	100					Muck	Original hydric layer
16-20	10YR 5/1	97	7.5YR 4/6	3	С	PL	sand	
Type: C=	Concentration, D=	Depletion	RM=Reduced M	atrix CS=	Covered or	Coated Sa	nd Grains	<sup>2</sup> Location: PL=Pore Lining, M=Matrix.
	oil Indicators:	Depiction				coulcu ou		Indicators for Problematic Hydric
Histo			Strip	ped Mati	rix (S6)			2 cm Muck - (A10) (LRR K, L, MLRA 149
	c Epipedon (A2)				(S7) (LRR	R, MLRA	149B)	Coast Prairie Redox (A16) (LRR K, L, R
	k Histic (A3)						, R, MLRA 149 B	_
	rogen Sulfide (A4)						ILRA 149B)	□ Dark Surface (S7) (LRR K, L)
	tified Layers (A5)				/ Mineral (F		_	Polyvalue Below Surface (S8) (LRR K, I
_	leted Below Dark S	Surface (A			d Matrix (F		, _ <b>,</b>	☐ Thin Dark Surface (S9) (LRR K, L)
	k Dark Surface (A					,		☐ Iron-Manganese Masses (F12) (LRR K, L,
	dy Mucky Mineral				Surface (F6	)		Piedmont Floodplain Soils (F19) (MLRA 149
	dy Gleyed Matrix (	. ,			k Surface (	•		Mesic Spodic (TA6) (MLRA 144A, 145, 1498
	dy Redox (S5)				ssions (F8)	.,,		$\square \text{ Red Parent Material (F21)}$
	of hydrophytic veg	lotation an			. ,	inloce dictu	rhed or	Very Shallow Dark Surface (TF12)
problematic				gy must t	e present, i			$\square$ Other (Explain in Remarks)
Restricti	ve Laver (if obs	erved).						
	ive Layer (if obse	erved):						
Type:		erved):						Hydric Soil Present? Yes 🛛 No 🗌
Type: Depth (in	uches):		ydric soils indicat	or Redox	Dark Surfa	nce (F6) is s		
Type: Depth (in Remarks:	nches): : Hydric soils are p		ydric soils indicat	or Redox	Dark Surfa	nce (F6) is s		Hydric Soil Present? Yes 🛛 No 🗌
Type: Depth (in Remarks: layer. YDROL	nches): : Hydric soils are p	present. H	ydric soils indicat	or Redox	Dark Surfa	ice (F6) is :		Hydric Soil Present? Yes 🛛 No 🗌
Type: Depth (in Remarks: layer. YDROL Wetland	 iches): : Hydric soils are p . <b>OGY</b>	oresent. H cators:				nce (F6) is s		Hydric Soil Present? Yes 🛛 No 🗌 deposition of fill materials over original muck
Type: Depth (in Remarks: layer. YDROL Wetland Primary In	.OGY Hydric soils are p	oresent. H cators:	s required; check	all that a				Hydric Soil Present? Yes 🛛 No 🗌 deposition of fill materials over original muck
Type: Depth (in Remarks: layer. YDROL Wetland Primary In Sur		cators: m of one is	s required; check	all that a	ρρίγ)	ves (B9)		Hydric Soil Present? Yes 🛛 No 🗌 deposition of fill materials over original muck
Type: Depth (in Remarks: layer. YDROL Wetland Primary In Sur Hig	.OGY Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1)	cators: m of one is	s required; check	all that a	pply) Stained Lea	ves (B9) 3)		Hydric Soil Present?       Yes       No         deposition of fill materials over original muck         Secondary Indicators (minimum of two required
Type: Depth (in Remarks: layer. YDROL Wetland Primary In Sur Hig Sat	.OGY Hydric soils are p .OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2	cators: m of one is	s required; check	<u>all that a</u> Water-: Aquatic	pply) Stained Lea : Fauna (B1	ves (B9) 3) 5)		Hydric Soil Present? Yes ⊠ No □ deposition of fill materials over original muck Secondary Indicators (minimum of two required □ Surface Soil Cracks (B6) □ Drainage Patterns (B10)
Type: Depth (in Remarks: layer. YDROL Wetland Primary In Sur Hig Sat Wa		cators: m of one is	s required; check	<u>all that a</u> Water-: Aquatic Marl De	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide (	ves (B9) 3) 5) Odor (C1)	satisfied. Likely	Hydric Soil Present?       Yes       No         deposition of fill materials over original muck         Secondary Indicators (minimum of two required
Type: Depth (in Remarks: layer. YDROL Wetland Primary II Sur Hig Sat War Sed	.OGY Hydric soils are p OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1)	cators: m of one is	s required; check	<u>all that a</u> Water-: Aquatic Marl De Hydrog	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide (	ves (B9) 3) 5) Odor (C1) eres on Livi	satisfied. Likely	Hydric Soil Present?       Yes       No         deposition of fill materials over original muck         Secondary Indicators (minimum of two required
Type: Depth (in Remarks: layer. YDROL Wetland Primary In Sur Hig Sat Wa Sed Sed		cators: m of one is	s required; check	all that a Water-: Aquatic Marl De Hydrog Oxidize	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide ( d Rhizosph ce of Reduc	ves (B9) 3) 5) Odor (C1) eres on Livi red Iron (C4	satisfied. Likely	Hydric Soil Present?       Yes       No         deposition of fill materials over original muck         Secondary Indicators (minimum of two required
Type: Depth (in Remarks: layer. YDROL Wetland Primary In Sur Hig Satu Satu Satu Satu Satu Satu Satu		cators: m of one is	s required; check	<u>all that a</u> Water Aquatic Marl De Hydrog Oxidize	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide ( d Rhizosph ce of Reduc Iron Reduc	ives (B9) 3) 5) Odor (C1) eres on Livi red Iron (C4 ttion in Tille	satisfied. Likely	Hydric Soil Present?       Yes       No         deposition of fill materials over original muck         Secondary Indicators (minimum of two required
Type: Depth (in Remarks: layer. YDROL Wetland Primary II Sur Hig Sat War Sed Orif Alga		cators: m of one is 2)	s required; check	<u>all that a</u> Water- Aquatic Marl De Hydrog Oxidize Present Recent	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide ( d Rhizosph ce of Reduc Iron Reduc uck Surface	ves (B9) 3) Ddor (C1) eres on Livi red Iron (C4 ttion in Tille	satisfied. Likely	Hydric Soil Present?       Yes       No         deposition of fill materials over original muck         Secondary Indicators (minimum of two required
Type: Depth (in Remarks: layer. YDROL Wetland Primary In Sur Hig Sur Hig Sat Var Sed Drif Alga Iror Inu	Addition of the second state of the second sta	cators: m of one is 2) 4) Aerial Ima	s required; check	<u>all that a</u> Water- Aquatic Marl De Hydrog Oxidize Present Recent	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide ( d Rhizosph ce of Reduc Iron Reduc	ves (B9) 3) Ddor (C1) eres on Livi red Iron (C4 ttion in Tille	satisfied. Likely	Hydric Soil Present?       Yes       No         deposition of fill materials over original muck         Secondary Indicators (minimum of two required
Type: Depth (in Remarks: layer. YDROL Wetland Primary In G Sur G Sur Sur Sur Sur Sur Sur Sur Sur Sur Sur		cators: m of one is 2) 4) Aerial Ima	s required; check	<u>all that a</u> Water- Aquatic Marl De Hydrog Oxidize Present Recent	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide ( d Rhizosph ce of Reduc Iron Reduc uck Surface	ves (B9) 3) Ddor (C1) eres on Livi red Iron (C4 ttion in Tille	satisfied. Likely	Hydric Soil Present?       Yes       No         deposition of fill materials over original muck         Secondary Indicators (minimum of two required
Type: Depth (in Remarks: layer. YDROL Wetland Primary II Sur Hig Sat Var Sed Orif Alga Iror Inu Spa	Indexes): Hydric soils are provide the solution of the	cators: m of one is 2) 4) Aerial Ima	s required; check	<u>all that a</u> Water- Aquatic Marl De Hydrog Oxidize Present Recent	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide ( d Rhizosph ce of Reduc Iron Reduc uck Surface	ves (B9) 3) Ddor (C1) eres on Livi red Iron (C4 ttion in Tille	satisfied. Likely	Hydric Soil Present?       Yes       No         deposition of fill materials over original muck         Secondary Indicators (minimum of two required
Type: Depth (in Remarks: layer. YDROL Wetland Primary In Sur Hig Sat Var Sed Drif Iror Inu Spa	Additional and a constraint of the servations:	cators: m of one is 2) 4) Aerial Ima oncave Su	s required; check	all that a Water-: Aquatic Marl De Hydrog Oxidize Present Recent Chin M Other (	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide ( d Rhizosph ce of Reduc Iron Reduc Iron Reduc uck Surface Explain in F	ves (B9) 3) 5) Odor (C1) eres on Livi red Iron (C4 tion in Tille (C7) Remarks)	satisfied. Likely	Hydric Soil Present?       Yes       No         deposition of fill materials over original muck         Secondary Indicators (minimum of two required
Type: Depth (in Remarks: layer. YDROL Wetland Primary In Sur Hig Sat Nai Sed Orif Alga Iror Inu Spa Field Ob Surface V	Addressite in the second secon	oresent. H cators: m of one is m of one is 2) 2) 2) 4) Aerial Ima oncave Su Yee	s required; check	<u>all that a</u> Water-: Aquatic Marl De Hydrog Oxidize Present Recent Chin M Other (	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide ( d Rhizosph ce of Reduc Iron Reduc Iron Reduc uck Surface Explain in F	ves (B9) 3) 5) Odor (C1) eres on Livi red Iron (C <sup>2</sup> ttion in Tille ttion in Tille (C7) Remarks)	satisfied. Likely	Hydric Soil Present?       Yes       No         deposition of fill materials over original muck         Secondary Indicators (minimum of two required         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Saturation Visible on Aerial Imagery (C9)         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)         Shallow Aquitard (D3)         FAC-Neutral Test (D5)         Microtopographic Relief (D4)
Type: Depth (in Remarks: layer. YDROL Wetland Primary II Sur Hig Sat Var Sat Orif Alga Iror Inu Spa Field Ob Surface W Water Tai	Aches): Hydric soils are p .OGY Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B3) al Mat or Crust (B4 n Deposits (B5) undation Visible on arsely Vegetated Co servations: Vater Present?	oresent. H cators: m of one is m of one is 2) 2) 2) 4) Aerial Ima oncave Su Yes Yes	s required; check	<u>all that a</u> Water-: Aquatic Marl De Hydrog Oxidize Present Recent Recent Other ( De De	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide ( d Rhizosph ce of Reduc Iron Reduc uck Surface Explain in F Explain in F	ves (B9) 3) Odor (C1) eres on Livi red Iron (C4 tion in Tille (C7) Remarks) ): ):	satisfied. Likely	Hydric Soil Present?       Yes       No         deposition of fill materials over original muck         Secondary Indicators (minimum of two required
Type: Depth (in Remarks: layer. YDROL Wetland Primary In Sur Hig Sat Hig Sat Orif Alga Iror Inu Spa Field Ob Surface V Water Tal Saturation (includes	Addressite in the second secon	oresent. H cators: m of one is m of one is 2) 2) 2) 4) Aerial Ima oncave Su Yes Yes Yes	s required; check	all that a Water-3 Aquatic Aquatic Marl De Hydrog Oxidize Recent Recent Other ( De De De De	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide ( d Rhizosph ce of Reduc Iron Reduc uck Surface Explain in F pth (inches pth (inches pth (inches	ves (B9) 3) 5) Odor (C1) eres on Livi red Iron (C <sup>2</sup> tion in Tille (C7) Remarks) ): ): ):	satisfied. Likely	Hydric Soil Present?       Yes       No         deposition of fill materials over original muck         Secondary Indicators (minimum of two required         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)         Shallow Aquitard (D3)         FAC-Neutral Test (D5)         Microtopographic Relief (D4)         Indicators of         Wetland Hydrology Present?         Yes       No
Type: Depth (in Remarks: layer. YDROL Wetland Primary In Sur Hig Sat Hig Sat Orif Alga Iror Inu Spa Field Ob Surface V Water Tal Saturation (includes	Addressite in the second secon	oresent. H cators: m of one is m of one is 2) 2) 2) 4) Aerial Ima oncave Su Yes Yes Yes	s required; check	all that a Water-3 Aquatic Aquatic Marl De Hydrog Oxidize Recent Recent Other ( De De De De	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide ( d Rhizosph ce of Reduc Iron Reduc uck Surface Explain in F pth (inches pth (inches pth (inches	ves (B9) 3) 5) Odor (C1) eres on Livi red Iron (C <sup>2</sup> tion in Tille (C7) Remarks) ): ): ):	satisfied. Likely	Hydric Soil Present?       Yes       No         deposition of fill materials over original muck         Secondary Indicators (minimum of two required
Type: Depth (in Remarks: layer. YDROL Wetland Primary In Sur Hig Sat Var Sed Orif Iror Inu Spa Field Ob Surface V Water Tal Saturation (includes Describe I	Addressite in the second equation of the second equation of the second equation of the second equation (A3) and the second equation	cators: m of one is m of one is 2) 2) 4) Aerial Ima oncave Su Yes Yes Yes Yes	s required; check	all that a Water-3 Aquatic Aquatic Marl De Hydrog Oxidize Recent Recent Other ( De De De	pply) Stained Lea Fauna (B1 eposits (B1! en Sulfide ( d Rhizosph ce of Reduc Iron Reduc Iron Reduc uck Surface Explain in F pth (inches pth (inches pth (inches photos, pre	ves (B9) 3) 5) Odor (C1) eres on Livi red Iron (C <sup>2</sup> tion in Tille (C7) Remarks) ): ): ): vious inspective	satisfied. Likely ing Roots (C3) 4) ed Soils (C6)	Hydric Soil Present?       Yes       No         deposition of fill materials over original muck         Secondary Indicators (minimum of two required
Type: Depth (in Remarks: layer. YDROL Wetland Primary In Sur Hig Sat Sat Sed Orif Iror Inu Spa Field Ob Surface V Water Tal Saturation (includes Describe	Addres): Hydric soils are p OGY Hydrology Indi I Hydrology Indi I Hydrology Indi I Hydrology Indi I Hydrology Indi I Hydrology Indi I Hydrology Indi (A2) I Hydrology I Hydrology I I Hydrology I Hydrology I I Hyd	cators: m of one is m of one is 2) 2) 4) Aerial Ima oncave Su Yes Yes Yes Yes	s required; check	all that a Water-3 Aquatic Aquatic Marl De Hydrog Oxidize Recent Recent Other ( De De De	pply) Stained Lea Fauna (B1 eposits (B1! en Sulfide ( d Rhizosph ce of Reduc Iron Reduc Iron Reduc uck Surface Explain in F pth (inches pth (inches pth (inches photos, pre	ves (B9) 3) 5) Odor (C1) eres on Livi red Iron (C <sup>2</sup> tion in Tille (C7) Remarks) ): ): ): vious inspective	satisfied. Likely ing Roots (C3) 4) ed Soils (C6)	Hydric Soil Present?       Yes       No         deposition of fill materials over original muck         Secondary Indicators (minimum of two required         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Crayfish Burrows (C8)         Stunted or Stressed Plants (D1)         Geomorphic Position (D2)         Shallow Aquitard (D3)         FAC-Neutral Test (D5)         Microtopographic Relief (D4)         Indicators of         Wetland Hydrology Present?         Yes       No



Photo 29. Data Point 21, view to the north.

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				epin Sampling Date: September 26, 2018_
				Sample Point: DP22
				n, Township, Range: <u>Section 4, T118N, R21W</u> none): <u>none</u> Slope (%): <u>&lt; 1%</u>
				-93.346948 Datum: WGS84
				NWI classification: Datum. WG364
Are climatic hydrologic conditions on the site typical for th				
Are Vegetation , Soil , or Hydrology s	-			nal Circumstances" present? Yes No
Are Vegetation, Soil, or Hydrology			•	d, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map sh	nowing sa	mpling p	point locatio	ns, transects, important features, etc.
Hydrophytic Vegetation Present? Yes	No	$\boxtimes$	Is the Sam	pled Area
Hydric Soil Present? Yes 🛛	No			/etland? Yes No
Wetland Hydrology Present? Yes	No	$\boxtimes$	If yes, option	nal Wetland Side ID:
Remarks: (Explain alternative procedures here or in a conditions on the site were within normal range at the				of the antecedent precipitation indicates the hydrologic nown regularly; likely deposition of fill materials.
VEGETATION - Use scientific names of plants				
	Absolute	Dominant	Indicator	<b>50/20 Thresholds</b> 20% 50%
Tree Stratum (Plot size:)	% Cover	Species?	Status	Tree Stratum
1.				Sapling/Shrub Stratum
2.		ĺ		Herb Stratum <u>20</u> <u>50</u>
3.	-			Woody Vine Stratum
4.				Dominance Test worksneet:
5.	_			Number of Dominant Species
		= Total Co	over	That Are OBL, FACW, or FAC: <u>0</u> (A)
Sapling/Shrub Stratum (Plot size:)				Total Number of Dominant
1.				Species Across All Strata: <u>3</u> (B)
2.				Percent of Dominant Species
3.				That Are OBI, FACW, or FAC: <u>0</u> (A/B)
4.				Prevalence Index worksheet:
5.				Total % Cover of. Multiply by:
		= Total Co	over	OBL species $x = 1 = 1$
Herb Stratum (Plot size: 5 feet)				FACW species         x 2 =           FAC species         x 3 =
1. Poa pratensis	45	Х	FACU	FACU species x 4 =
2. Trifolium repens	20	Х	FACU	UPL species         x 1 =           VPL species         x 5 =
3. Digitaria ischaemum	20	Х	FACU	Column Totals: (A) (B)
4. Ambrosia artemisiifolia	15		FACU	Prevalence Index = $B/A = $
5.	_			Hydrophytic Vegetation Indicators:
6.				Rapid Test for Hydrophytic Vegetation
7.				$\_$ Dominance Test is >50%
8.				Prevalence Index is $\leq 3.0^1$
9.				Morphological Adaptations' (Provide supporting
10.				data in Remarks or on a separate sheet)
11.				Problematic Hydrophytic Vegetation' (Explain)
12.	100	= Total Co	over	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be
Woody Vine Stratum (Plot size:)		-		present, unless disturbed or problematic. Definitions of Vegetation Strata:
1.				<b>Tree</b> – Woody plants 3 in. (7.6 cm) or more in diameter at
2.	_			breast height (DBH), regardless of height.
Remarks: (Include photo numbers here or on a separate	sheet) Hv	<u>= Total Co</u>		Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
not present. Sampling point along transect consisting of wetland.			-	<b>Herb</b> – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
				Woody vines – All woody vines greater than 3.28 ft in height.
				Hydrophytic Vegetation Present? Yes No _ 🛛 _

SO	IL
----	----

Depth	cription: (Describe Matrix			Redox Fea				
inches)	Color (moist)	%	Color (moist	) %	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-6	10YR 3/1	100					Sandy loar	m
6-18	10YR 3/1	97	5YR 4/4	3	С	М	Sandy loai	m
Type: C=	Concentration, D=	Depletion	. RM=Reduced	Matrix, CS=	=Covered or	r Coated Sa	and Grains.	<sup>2</sup> Location: PL=Pore Lining, M=Matrix.
/1	oil Indicators:		,					Indicators for Problematic Hydric
Histo			Si	ripped Mat	rix (S6)			2 cm Muck - (A10) (LRR K, L, MLRA 149
🔲 Histi	c Epipedon (A2)		<u> </u>	ark Surface	(S7) (LRR	R, MLRA	149B)	Coast Prairie Redox (A16) (LRR K, L,
	k Histic (A3)						R, MLRA 149 I	_
	rogen Sulfide (A4)	)					ILRA 149B)	Dark Surface (S7) (LRR K, L)
	tified Layers (A5)			amy Muck	y Mineral (F	- 1) (LRR	(, L)	Polyvalue Below Surface (S8) (LRR K,
	leted Below Dark	Surface (A					-	Thin Dark Surface (S9) (LRR K, L)
Depleted Below Dark Surface (A11)     Loamy Gleyed Matrix (F2)     Depleted Matrix (F3)								Iron-Manganese Masses (F12) (LRR K, L,
	dy Mucky Mineral				Surface (F6	)		Piedmont Floodplain Soils (F19) (MLRA 14
	dy Gleyed Matrix (		<u> </u>	epleted Dai	rk Surface (	F7)		Mesic Spodic (TA6) (MLRA 144A, 145, 149
	dy Redox (S5)				ssions (F8)			Red Parent Material (F21)
1ndicators	of hydrophytic vec	etation ar	nd wetland hydro	ology must l	pe present, i	unless distu	irbed or	Very Shallow Dark Surface (TF12)
roblematic	2.	-						Other (Explain in Remarks)
Restricti	ive Layer (if obs	erved):						
Type:								Hydric Soil Present? Yes 🖄 No 🗌
Depth (in	iches):							
Remarks:	Hydric soils are p	oresent. H	lydric soils indi	ator Redox	Dark Surfa	ace (F6) is	satisfied.	
YDROL	, ,						Subficul	
Wetland	l Hydrology Indi	cators:						
	ndicators (minimu		is required; che	ck all that a	ipply)			Secondary Indicators (minimum of two require
	face Water (A1)				Stained Lea	aves (B9)		Surface Soil Cracks (B6)
	h Water Table (A2	2)			c Fauna (B1			Drainage Patterns (B10)
-	uration (A3)	-)		•	eposits (B1			$\_$ Moss Trim Lines (B16)
	ter Marks (B1)		-		ien Sulfide (			Dry-Season Water Table (C2)
	liment Deposits (B	(2)	-		•	( )	ring Roots (C3)	
	ft Deposits (B3)	~_)	-		ce of Reduc			Cardinal Darions (CC)
	al Mat or Crust (B4	4)	-				ed Soils (C6)	Stunted or Stressed Plants (D1)
-	n Deposits (B5)	T)	-		luck Surface			Geomorphic Position (D2)
_	Indation Visible on	Aorial Im	- 		(Explain in F			Shallow Aquitard (D3)
					(схрантит	(Ciliai KS)		FAC-Neutral Test (D5)
_ <u> </u>	arsely Vegetated C	Uncave Sc	unace (Do)					Microtopographic Relief (D4)
	servations: Vater Present?	V-	s 🗌 🛛 No 🛛	7 -	nth (inches	·)•		Indicators of
	ble Present?		is∐ No∐ is⊠ No[		pth (inches pth (inches			Wetland Hydrology Present?
	n Present?		s 🛛 No [	_	pth (inches			Yes No
(includes	capillary fringe)					-		
Describe	Recorded Data (st	ream gau	ge, monitoring,	well, aerial	photos, pre	evious insp	ections), if avai	ilable:
			e > 12 inches i	n depth; we	etland hydro	ology neith	ner present nor	indicated. Heavy rainfall (4.5 inches) 5 days p
and 0.3 i	nches 2 days prio	r.						
Photo S	ee Photo 30.							



Photo 30. Data Point 22, view to the north.

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		epin Sampling Date: September 26, 2018						
Applicant/Owner: Metropolitan Airports Commission								
Investigator(s): Brauna Hartzell, Mead & Hunt, Inc. Section, Township, Range: Section 4, T118N, R21W								
				none): <u>none</u> Slope (%): <u>&lt; 1%</u>				
			-	-93.347465 Datum: WGS84				
				A) NWI classification:				
Are climatic hydrologic conditions on the site typical for th	is time of ye	ear? Yes 🧕 🕻						
Are Vegetation, Soil, or Hydrology	significantly	disturbed?	Are "Norn	nal Circumstances" present? Yes No				
Are Vegetation, Soil, or Hydrology	naturally pro	blematic?	(If neede	d, explain any answers in Remarks.)				
SUMMARY OF FINDINGS - Attach site map sh	nowing sa	mpling p	oint locatio	ns, transects, important features, etc.				
Hydrophytic Vegetation Present? Yes	No	$\boxtimes$	Is the Sam	pled Area				
Hydric Soil Present? Yes 🖂	No		within a Wetland? Yes No					
Wetland Hydrology Present? Yes	No	$\boxtimes$	If yes, optio	nal Wetland Side ID:				
Remarks: (Explain alternative procedures here or in a conditions on the site were within normal range at the				of the antecedent precipitation indicates the hydrologic nown regularly; likely deposition of fill materials.				
VEGETATION - Use scientific names of plants	1							
	Absolute	Dominant	Indicator	<b>50/20 Thresholds</b> 20% 50%				
Tree Stratum (Plot size:)	% Cover	Species?	Status	Tree Stratum				
1.				Sapling/Shrub Stratum				
2.				Herb Stratum <u>20</u> <u>50</u>				
3.	_			Woody Vine Stratum				
4.				Dominance Test worksheet:				
5.				Number of Dominant Species				
		= Total Co	ver	That Are OBL, FACW, or FAC: <u>0</u> (A)				
Sapling/Shrub Stratum (Plot size:)				Total Number of Dominant				
1.				Species Across All Strata: <u>1</u> (B)				
2.				Percent of Dominant Species				
3.				That Are OBI, FACW, or FAC: <u>0</u> (A/B)				
4.				Prevalence Index worksheet:				
5.				Total % Cover of. Multiply by:				
		= Total Co	ver	OBL species x 1 =				
<u>Herb Stratum</u> (Plot size: <u>5 feet</u> )				FACW species $x 2 = $				
1. Poa pratensis	65	Х	FACU	FAC species $x 3 = $				
2. Trifolium repens	15		FACU	FACU species         x 4 =           UPL species         x 5 =				
3. Elymus repens	10		FACU					
4. Digitaria ischaemum	8		FACU	Column Totals: (A) (B) Prevalence Index = B/A =				
5. Ambrosia artemisiifolia	1		FACU	Hydrophytic Vegetation Indicators:				
6. Potentilla arguta	1		FACU	Rapid Test for Hydrophytic Vegetation				
7.				Dominance Test is >50%				
8.				Prevalence Index is $\leq 3.0^{1}$				
9.				Morphological Adaptations' (Provide supporting				
10.				data in Remarks or on a separate sheet)				
11.				Problematic Hydrophytic Vegetation' (Explain)				
12.				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be				
	100	= Total Co	ver	present, unless disturbed or problematic.				
Woody Vine Stratum (Plot size:)				Definitions of Vegetation Strata:				
1.				<b>Tree</b> – Woody plants 3 in. (7.6 cm) or more in diameter at				
2.								
Bemarke: (Include photo numbers here or on a constate	choot ) H	= Total Co		Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.				
Remarks: (Include photo numbers here or on a separate			-	,				
not present. Sampling point along transect consisting wetland.	<ul> <li>Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.</li> <li>Woody vines – All woody vines greater than 3.28 ft in height.</li> </ul>							
				Hydrophytic Vegetation Present?				
				Yes No X				

Depth	Matrix		F	Redox Fea	itures			
inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-6	10YR 3/1	100					Sandy loam	
6-14	10YR 3/1	95	7.5YR 4/6	5	С	М	Sandy loam	
14-16	10YR 3/1	100					Sandy loam	Many undecomposed twigs, sticks, bark
	Concentration, D=	Depletion	, RM=Reduced Ma	atrix, CS=	Covered or	Coated Sa	and Grains.	<sup>2</sup> Location: PL=Pore Lining, M=Matrix.
Histo	c Epipedon (A2)			Surface	(S7) <b>(LRR</b>		-	Indicators for Problematic Hydric 2 cm Muck - (A10) (LRR K, L, MLRA 1491 Coast Prairie Redox (A16) (LRR K, L, R
	k Histic (A3)						R, MLRA 149 B	
	rogen Sulfide (A4)	)	_				ILRA 149B)	Dark Surface (S7) (LRR K, L)
	tified Layers (A5)	- <i></i> (1			/ Mineral (F	<i>,</i> .	(, L)	Polyvalue Below Surface (S8) (LRR K, I
	leted Below Dark	•	-		d Matrix (F	2)		Thin Dark Surface (S9) (LRR K, L)
	k Dark Surface (A		Dep			<b>`</b>		Iron-Manganese Masses (F12) (LRR K, L,
	dy Mucky Mineral				Surface (F6	•		Piedmont Floodplain Soils (F19) (MLRA 149
	dy Gleyed Matrix (	54)			k Surface (			Mesic Spodic (TA6) (MLRA 144A, 145, 1498
	dy Redox (S5)				ssions (F8)			Red Parent Material (F21)
roblematic	of hydrophytic veg	jetation an	d wetland hydrolo	gy must b	e present,	uniess distu	irbed or	Very Shallow Dark Surface (TF12)
	ve Layer (if obs	orwod)u						Other (Explain in Remarks)
Type: hai		erveu):						
							1	Hydric Soil Present? Ves 🕅 No 🗍
Depth (in	iches): <u>16</u>	present H	wdric soils indicat	or Redov	Dark Surfa	ace (F6) is		Hydric Soil Present? Yes 🖾 No 🗌
Depth (in Remarks: layer. Du YDROL	iches): <u>16</u> : Hydric soils are p ug to refusal at 16 . <b>OGY</b>	inches in		or Redox	Dark Surfa	ace (F6) is		Hydric Soil Present? Yes 🛛 No 🗌 deposition of fill materials over original muck
Depth (in Remarks: layer. Du YDROL Wetland	iches): <u>16</u> : Hydric soils are p ug to refusal at 16 .OGY I Hydrology Indi	inches in	depth.			ace (F6) is		deposition of fill materials over original muck
Depth (in Remarks: layer. Du <b>YDROL</b> Wetland Primary I	iches): <u>16</u> : Hydric soils are p ug to refusal at 16 .OGY I Hydrology Indi ndicators (minimu	inches in	depth. s required; check	all that a	ρρίγ)			· _
Depth (in Remarks: layer. Du YDROL Wetland Primary I Sur	iches): <u>16</u> : Hydric soils are p ug to refusal at 16 .OGY I Hydrology Indi ndicators (minimu face Water (A1)	cators:	depth. s required; check	<u>all that a</u> Water-:	pply) Stained Lea	ives (B9)		deposition of fill materials over original muck <u>Secondary Indicators (minimum of two required</u>
Depth (in Remarks: layer. Du YDROL Wetland Primary I Sur Hig	iches): <u>16</u> Hydric soils are p ug to refusal at 16 <b>.OGY</b> Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2	cators:	depth. s required; check	<u>all that a</u> Water-:	ρρίγ)	ives (B9)		deposition of fill materials over original muck Secondary Indicators (minimum of two required
Depth (in Remarks: layer. Du Y DROL Wetland Primary I Sur Hig Sat	iches): <u>16</u> : Hydric soils are p ug to refusal at 16 . <b>OGY</b> I Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3)	cators:	depth. s required; check	all that a Water-: Aquatic Marl De	pply) Stained Lea Fauna (B1 eposits (B1	ives (B9) 3) 5)		deposition of fill materials over original muck  Secondary Indicators (minimum of two required  Surface Soil Cracks (B6)  Drainage Patterns (B10)  Moss Trim Lines (B16)
Depth (in Remarks: layer. Du Y DROL Wetland Primary I Sur Hig Sat Wa	the solution of the solution o	cators: m of one i	depth. s required; check	<u>all that a</u> Water-: Aquatio Marl De	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide (	ives (B9) 3) 5) Odor (C1)	satisfied. Likely	deposition of fill materials over original muck         Secondary Indicators (minimum of two required
Depth (in Remarks: layer. Du YDROL Wetland Primary I Sur Hig Sat Wa Sec	iches): <u>16</u> Hydric soils are p ug to refusal at 16 <b>OGY</b> Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B	cators: m of one i	depth. s required; check	all that a Water- Aquatic Marl De Hydrog	pply) Stained Lea Fauna (B1 eposits (B1! en Sulfide ( d Rhizosph	oves (B9) 3) 5) Odor (C1) eres on Liv	ring Roots (C3)	deposition of fill materials over original muck         Secondary Indicators (minimum of two required
Depth (in Remarks: layer. Du <b>Y DROL</b> Wetland Primary I Sur Bur Hig Sat Wa Sec Diff	tches): <u>16</u> Hydric soils are p g to refusal at 16 <b>OGY</b> Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B ft Deposits (B3)	cators: m of one i	depth. s required; check	all that a Water-: Aquatio Marl De Hydrog Oxidize	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide d Rhizosph ce of Reduc	ives (B9) 3) 5) Odor (C1) eres on Liv ced Iron (C	satisfied. Likely	deposition of fill materials over original muck         Secondary Indicators (minimum of two required
Depth (in Remarks: layer. Du <b>Y DROL</b> Wetland Primary I Sur Hig Sat Sat Va Sec Drif	iches): <u>16</u> Hydric soils are p g to refusal at 16 <b>.OGY</b> <b>Hydrology Indi</b> ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B <sup>4</sup> )	cators: m of one i	s required; check	all that a Water Aquatic Marl De Hydrog Oxidize Present	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide d Rhizosph ce of Reduc Iron Reduc	oves (B9) 3) 5) Odor (C1) eres on Liv ced Iron (C ction in Tille	ring Roots (C3)	deposition of fill materials over original muck         Secondary Indicators (minimum of two required
Depth (in Remarks: layer. Du <b>YDROL</b> Wetland Primary I Sur Hig Sur Sur Sur Sur Sur Sur Sur Sur Sur Alig Sur Sur Sur Sur Sur Sur Sur Sur Sur Sur	the solution of the solution o	cators: m of one i 2) 2)	s required; check	all that a Water- Aquatio Marl De Hydrog Oxidize Present Recent	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide ( d Rhizosph ce of Reduc Iron Reduc uck Surface	ives (B9) 3) Odor (C1) eres on Liv ced Iron (C ction in Tille e (C7)	satisfied. Likely	deposition of fill materials over original muck         Secondary Indicators (minimum of two required
Depth (in Remarks: layer. Du <b>Y DROL</b> Wetland Primary I Sur Big Sur Sur Sur Sur Sur Sur Sur Sur Sur Sur	the solution of the solution o	cators: m of one i 2) 2) 4) Aerial Ima	s required; check	all that a Water- Aquatio Marl De Hydrog Oxidize Present Recent	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide d Rhizosph ce of Reduc Iron Reduc	ives (B9) 3) Odor (C1) eres on Liv ced Iron (C ction in Tille e (C7)	satisfied. Likely	deposition of fill materials over original muck         Secondary Indicators (minimum of two required
Depth (in Remarks: layer. Du <b>Y DROL</b> Wetland Primary I Sur Big Sur Big Sur Big Sur Big Sur Big Sur Dif Big Drif Drif Drif Drif Drif Drif Drif Drif	the solution of the solution o	cators: m of one i 2) 2) 4) Aerial Ima	s required; check	all that a Water- Aquatio Marl De Hydrog Oxidize Present Recent	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide ( d Rhizosph ce of Reduc Iron Reduc uck Surface	ives (B9) 3) Odor (C1) eres on Liv ced Iron (C ction in Tille e (C7)	satisfied. Likely	deposition of fill materials over original muck         Secondary Indicators (minimum of two required
Depth (in Remarks: layer. Du <b>YDROL</b> Wetland Primary I Sur Hig Sat Sat Sec Drif Iror Inu Spa	iches): <u>16</u> Hydric soils are p ug to refusal at 16 <b>OGY</b> Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4 n Deposits (B5) indation Visible on arsely Vegetated C	cators: m of one i 2) 2) 4) Aerial Ima	s required; check	all that a Water- Aquatio Marl De Hydrog Oxidize Present Recent	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide ( d Rhizosph ce of Reduc Iron Reduc uck Surface	ives (B9) 3) Odor (C1) eres on Liv ced Iron (C ction in Tille e (C7)	satisfied. Likely	deposition of fill materials over original muck         Secondary Indicators (minimum of two required
Depth (in Remarks: layer. Du <b>Y DROL</b> Wetland Primary I Sur Sur Sur Sur Sur Sur Sur Sur Sur Sur	the solution of the solution o	<ul> <li>inches in</li> <li>cators:</li> <li>m of one i</li> <li>2)</li> <li>4)</li> <li>Aerial Ima oncave Su</li> </ul>	depth. s required; check	all that a Water-: Aquatic Marl De Hydrog Oxidize Present Recent Thin M Other (	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide ( d Rhizosph ce of Reduc Iron Reduc Iron Reduc uck Surface Explain in F	ives (B9) 3) 5) Odor (C1) eres on Liv ered Iron (C ttion in Tille c (C7) Remarks)	satisfied. Likely	deposition of fill materials over original muck         Secondary Indicators (minimum of two required
Depth (in Remarks: layer. Du <b>Y DROL</b> Wetland Primary I Sur Surface V	Iches): <u>16</u> Hydric soils are p ug to refusal at 16 <b>.OGY</b> Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B ft Deposits (B3) al Mat or Crust (B4 n Deposits (B5) undation Visible on arsely Vegetated C servations:	2) Aerial Ima oncave Su	s required; check	all that a Water-: Aquatic Marl De Hydrog Oxidize Present Recent Thin M Other (	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide ( d Rhizosph ce of Reduc Iron Reduc uck Surface	ives (B9) 3) 5) Odor (C1) eres on Liv red Iron (C ttion in Tille (C7) Remarks)	satisfied. Likely	deposition of fill materials over original muck         Secondary Indicators (minimum of two required
Depth (in Remarks: layer. Du <b>Y DROL</b> Wetland Primary I Sur Sur Sat Drif Alg. Drif Alg. Drif Inu Sec Drif Surface V Water Ta	Inches): <u>16</u> Hydric soils are p ag to refusal at 16 <b>.OGY</b> <b>Hydrology Indi</b> I Hydrology Indi I hydrology Indi I hydrology Indi I hydrology Indi I hydrology Indi (A2) I hydrology Indi I hydrology I hydrology I I	2) Aerial Ima oncave Su Yee Yee	depth. <u>s required; check</u>	all that a Water- Aquatic Marl De Hydrog Oxidize Present Recent Thin M Other ( De De	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide ( d Rhizosph ce of Reduc Iron Reduc Iron Reduc uck Surface Explain in F	ives (B9) 3) 5) Odor (C1) eres on Liv red Iron (C ction in Tille c(C7) Remarks) ): ):	satisfied. Likely	deposition of fill materials over original muck  Secondary Indicators (minimum of two required  Surface Soil Cracks (B6)  Drainage Patterns (B10)  Moss Trim Lines (B16)  Dry-Season Water Table (C2)  Crayfish Burrows (C8)  Saturation Visible on Aerial Imagery (C9)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  FAC-Neutral Test (D5)  Microtopographic Relief (D4)  Indicators of
Depth (in Remarks: layer. Du <b>YDROL</b> Wetland Primary I Sur Sat Surface V Water Ta Saturation (includes	Iches): <u>16</u> Hydric soils are p ug to refusal at 16 <b>.OGY</b> Hydrology Indi ndicators (minimu face Water (A1) h Water Table (A2 uration (A3) ter Marks (B1) diment Deposits (B3) al Mat or Crust (B4) n Deposits (B3) al Mat or Crust (B4) n Deposits (B5) Indation Visible on arsely Vegetated C servations: Vater Present?	2) Aerial Ima oncave Su Yee Yee Yee Yee	depth. <u>s required; check</u>	all that a Water-: Aquatic Marl De Hydrog Oxidize Present Recent Thin M Other ( De De	pply) Stained Lea Fauna (B1 eposits (B1 en Sulfide ( d Rhizosph ce of Reduc Iron Reduc uck Surface Explain in R pth (inches pth (inches pth (inches	ives (B9) 3) 5) Odor (C1) eres on Liv red Iron (C ction in Tille (C7) Remarks) ): ): ):	satisfied. Likely ring Roots (C3) 4) ed Soils (C6)	deposition of fill materials over original muck         Secondary Indicators (minimum of two required
Depth (in Remarks: layer. Du Y DROL Wetland Primary I Sur Sur Surface V Water Ta Saturation (includes Describe Remarks:	Inches): <u>16</u> Hydric soils are p ag to refusal at 16 <b>.OGY</b> <b>Hydrology Indi</b> I Hydrology Indi I Hydrology Indi (A2) I Hydrology Indi I Hydrology Indi (A2) I Hydrology Indi (A2) I Hydrology Indi (A2) I Hydrology Indi I Hydrology Indi (A2) I Hydrology I Hydrology I Hydrology I I Hydrology I Hydrology I I Hydrology I Hydrology I I Hyd	a inches in cators: m of one i 2) 2) 4) Aerial Ima oncave Su Yes Yes Yes Yes	depth. <u>s required; check</u>	all that a Water-: Aquatic Marl De Hydrog Oxidize Present Recent Thin M Other ( De De De	pply) Stained Lea Fauna (B1 eposits (B1! en Sulfide ( d Rhizosph ce of Reduc Iron Reduc Iron Reduc uck Surface Explain in F pth (inches pth (inches pth (inches	ives (B9)         3)         5)         Odor (C1)         eres on Liv         ered Iron (C         tion in Tille         (C7)         Remarks)         ):	satisfied. Likely ving Roots (C3) 4) ed Soils (C6)	deposition of fill materials over original muck         Secondary Indicators (minimum of two required



Photo 31. Data point 23, view to the northwest.

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	epin Sampling Date: <u>September 26, 2018</u>			
		Sample Point: DP24		
				, Township, Range: <u>Section 4, T118N, R21W</u>
				none): <u>none</u> Slope (%): <u>&lt;1%</u>
			-	-93.347878 Datum: WGS84
				NWI classification:
Are climatic hydrologic conditions on the site typical for th				
Are Vegetation, Soil, or Hydrology				
Are Vegetation, Soil, or Hydrology I			•	d, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map sh	nowing sa	mpling p	oint locatio	ns, transects, important features, etc.
Hydrophytic Vegetation Present? Yes	No	$\boxtimes$	Is the Sam	pled Area
Hydric Soil Present? Yes 🛛	No		within a W	
Wetland Hydrology Present? Yes 🛛	No		If yes, option	nal Wetland Side ID:
Remarks: (Explain alternative procedures here or in a conditions on the site were within normal range at the				of the antecedent precipitation indicates the hydrologic own regularly; likely deposition of fill materials.
VEGETATION - Use scientific names of plants				
	Absolute	Dominant	Indicator	<b>50/20 Thresholds</b> 20% 50%
Tree Stratum (Plot size:)	% Cover	Species?	Status	Tree Stratum
1.				Sapling/Shrub Stratum
2.				Herb Stratum <u>21</u> <u>52.5</u>
3.				Woody Vine Stratum
4.				
5.				Number of Dominant Species
		= Total Co	ver	That Are OBL, FACW, or FAC: <u>0</u> (A)
Sapling/Shrub Stratum (Plot size:)				Total Number of Dominant
1.				Species Across All Strata: <u>2</u> (B)
2.				Percent of Dominant Species
3.				That Are OBI, FACW, or FAC: <u>0</u> (A/B)
4.	_			Prevalence Index worksheet: Total % Cover of. Multiply by:
5.	_			OBL species $x 1 = $
		= Total Co	ver	FACW species x 2 =
Herb Stratum (Plot size: <u>5 feet</u> )				FAC species x 2
1. Poa pratensis	40	Х	FACU	FACU species $x 4 =$
2. Elymus repens	40	Х	FACU	UPL species x 5 =
3. Trifolium repens	15		FACU	Column Totals: (A) (B)
4. Ambrosia artemisiifolia	10	-	FACU	Prevalence Index = B/A =
5.	_			Hydrophytic Vegetation Indicators:
6.				Rapid Test for Hydrophytic Vegetation
7.				Dominance Test is >50%
8. 9.				Prevalence Index is $\leq 3.0^1$
10.				Morphological Adaptations' (Provide supporting
11.				data in Remarks or on a separate sheet)
12.				Problematic Hydrophytic Vegetation' (Explain)
	105	= Total Co	ver	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Woody Vine Stratum (Plot size:)				Definitions of Vegetation Strata:
1.				<b>Tree</b> – Woody plants 3 in. (7.6 cm) or more in diameter at
2.	_			breast height (DBH), regardless of height.
Remarks: (Include photo numbers here or on a separate	e sheet.) Hy	<u>= Total Co</u> drophytic v		Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
not present. Sampling point along transect consisting wetland.			-	Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.
	Hydrophytic Vegetation Present?			
				Yes _ No _ X

inches)         Color (moist)           0-6         10YR 4/1           6-16         10YR 3/1	% 98 97	Color (moist) 7.5YR 4/6	% 2	Type <sup>1</sup> C	Loc <sup>2</sup>	Texture sand	Remarks
		· · · ·	2	С	м	sand	
6-16 10YR 3/1	97					Sana	
		5YR 3/4	3	С	М	Sandy loam	1
Type: C=Concentration, D=D	epletion, R	M=Reduced Ma	atrix, CS=	Covered or	· Coated Sa	nd Grains.	<sup>2</sup> Location: PL=Pore Lining, M=Matrix.
Hydric Soil Indicators:							Indicators for Problematic Hydric
Histosol (A1)		🔲 Strip	ped Matr	ix (S6)			2 cm Muck - (A10) (LRR K, L, MLRA 1491
Histic Epipedon (A2)		Dark	Surface	(S7) (LRR	R, MLRA	149B)	🔲 Coast Prairie Redox (A16) (LRR K, L, R
Black Histic (A3)		D Poly	value Belc	w Surface (	(S8) (LRR R	R, MLRA 149 B	) 5 cm Peat or Mucky Peat (S3) (LRR K, L, F
Hydrogen Sulfide (A4)		Thin	Dark Su	face (S9)	(LRR R, M	LRA 149B)	Dark Surface (S7) <b>(LRR K, L)</b>
Stratified Layers (A5)		Loar	ny Mucky	Mineral (F	1) (LRR K	, L)	Polyvalue Below Surface (S8) (LRR K, I
Depleted Below Dark Su	rface (A11	) 🔲 Loar	ny Gleye	d Matrix (F	2)		Thin Dark Surface (S9) (LRR K, L)
Thick Dark Surface (A12	2)	Dep	eted Mat	rix (F3)			Iron-Manganese Masses (F12) (LRR K, L, I
Sandy Mucky Mineral (S	1)		Piedmont Floodplain Soils (F19) (MLRA 149				
Sandy Gleyed Matrix (S4	1)			Surface (F6 k Surface (			Mesic Spodic (TA6) (MLRA 144A, 145, 149E
Sandy Redox (S5)	,			ssions (F8)			Red Parent Material (F21)
1ndicators of hydrophytic veget	ation and v					rhed or	Very Shallow Dark Surface (TF12)
problematic.			gy muse b	e present, i			Other (Explain in Remarks)
Restrictive Layer (if obser	ved):						
Type: <u>hard pan</u>							Hydric Soil Present? Yes 🗵 No 🗌
Depth (inches): <u>6</u>							
Remarks: Hydric soils are pre in depth.	esent. Hydi	ric soils indicat	ors Sandy	y Redox (S	5) and Red	ox Dark Surfac	e (F6) are satisfied. Difficult to dig below 6 inch
YDROLOGY							
Wetland Hydrology Indica							
Primary Indicators (minimum	of one is re						Secondary Indicators (minimum of two required
Surface Water (A1)				Stained Lea	• •		Surface Soil Cracks (B6)
High Water Table (A2)				: Fauna (B1			Drainage Patterns (B10)
Saturation (A3)			_ Marl De	eposits (B1	5)		Moss Trim Lines (B16)
Water Marks (B1)			_ Hydrog	en Sulfide	Odor (C1)		Dry-Season Water Table (C2)
Sediment Deposits (B2)		_	_ Oxidize	d Rhizosph	eres on Livi	ng Roots (C3)	Crayfish Burrows (C8)
Drift Deposits (B3)		_	_ Presen	ce of Reduc	ed Iron (C4	<del>1</del> )	Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4)			_ Recent	Iron Reduc	tion in Tille	d Soils (C6)	Stunted or Stressed Plants (D1)
Iron Deposits (B5)		_	_ Thin M	uck Surface	e (C7)		Geomorphic Position (D2)
Inundation Visible on A	erial Image	ery(B7)		Explain in F			Shallow Aquitard (D3)
Sparsely Vegetated Con			,	-	,		FAC-Neutral Test (D5)
		. ,					Microtopographic Relief (D4)
Field Observations:							
Surface Water Present?	Yes 🗌	No 🗌	De	oth (inches	):		Indicators of
Water Table Present?	Yes 🛛	🛛 No 🗌	De	oth (inches	): <u>13</u>		Wetland Hydrology Present?
Saturation Present?	Yes 🛛	🛛 No 🗌	De	oth (inches	): <u>12</u>		Yes_ <u>No</u>
	am daudo	monitorina, w	ell, aerial	photos, pre	evious inspe	ections), if availa	able:
(includes capillary fringe) Describe Recorded Data (stre	ani yauye,						
Describe Recorded Data (stre	ours; sampl	led near wetla	nd 2. Pot	-	ndwater gra	adient. Wetlan	d hydrology is present and indicated. Heavy



Photo 32. Data Point 24, view to the northwest.

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	epin Sampling Date: September 26, 2018_			
Applicant/Owner: Metropolitan Airports Commission				
				, Township, Range: <u>Section 4, T118N, R21W</u>
				none): <u>none</u> Slope (%): <u>&lt; 1%</u>
			-	-93.348369 Datum: WGS84
				A) NWI classification:
Are climatic hydrologic conditions on the site typical for th				
Are Vegetation, Soil, or Hydrology				nal Circumstances" present? Yes No
Are Vegetation, Soil, or Hydrology			•	d, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map sl	nowing sa	mpling p	oint locatio	ns, transects, important features, etc.
Hydrophytic Vegetation Present? Yes	No	$\boxtimes$	Is the Sam	pled Area
Hydric Soil Present? Yes 🖂	No		within a W	
Wetland Hydrology Present? Yes 🛛	No		If yes, option	nal Wetland Side ID:
Remarks: (Explain alternative procedures here or in a conditions on the site were within normal range at the				of the antecedent precipitation indicates the hydrologic own regularly; likely deposition of fill materials.
VEGETATION - Use scientific names of plants	;			
	Absolute	Dominant	Indicator	<b>50/20 Thresholds</b> 20% 50%
Tree Stratum (Plot size:)	% Cover	Species?	Status	Tree Stratum
1.				Sapling/Shrub Stratum
2.				Herb Stratum <u>20</u> <u>50</u>
3.				Woody Vine Stratum
4.				
5.				Number of Dominant Species
		= Total Co	ver	That Are OBL, FACW, or FAC: <u>0</u> (A)
Sapling/Shrub Stratum (Plot size:)				Total Number of Dominant
1.				Species Across All Strata: <u>2</u> (B)
2.				Percent of Dominant Species
3.				That Are OBI, FACW, or FAC: <u>0</u> (A/B) Prevalence Index worksheet:
4.				Total % Cover of. Multiply by:
5.				OBL species $\_$ $x 1 = \_$
		= Total Co	over	FACW species x 2 =
Herb Stratum (Plot size: <u>5 feet</u> )				FAC species x 3 =
1. Poa pratensis	60	X	FACU	FACU species x 4 =
2. Elymus repens	20	Х	FACU	UPL species x 5 =
3. Trifolium repens	15		FACU	Column Totals: (A) (B)
4. Taraxacum officinale	5		FACU	Prevalence Index = B/A =
5.				Hydrophytic Vegetation Indicators:
7.				Rapid Test for Hydrophytic Vegetation
8.				Dominance Test is >50%
9.				Prevalence Index is $\leq 3.0^1$
10.				Morphological Adaptations' (Provide supporting
11.				data in Remarks or on a separate sheet)
12.				Problematic Hydrophytic Vegetation' (Explain)
	100	= Total Co	ver	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
<u>Woody Vine Stratum</u> (Plot size:)				Definitions of Vegetation Strata:
1.				<b>Tree</b> – Woody plants 3 in. (7.6 cm) or more in diameter at
2.	-	<b>T</b> 1 1 C		breast height (DBH), regardless of height.
Remarks: (Include photo numbers here or on a separate	e sheet.) Hy	= Total Co drophytic v		<b>Sapling/shrub</b> – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
not present. Sampling point along transect consisting wetland.	Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.			
	Hydrophytic Vegetation Present?			
#### SOIL

	cription: (Describe	•	oth needed to d			or confirm	n the absence o	f indicators.)
Depth	Matrix			Redox Fea			_	
(inches)	Color (moist)	%	Color (moist)		Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-6	10YR 4/1	98	7.5YR 4/6	2	C	М	sand	
6-16	10YR 3/1	97	5YR 3/4	3	С	М	Sandy loa	m
					1			
Type: C=	Concentration, D=	=Depletion	, RM=Reduced	Matrix, CS=	Covered o	r Coated S	and Grains.	<sup>2</sup> Location: PL=Pore Lining, M=Matrix.
/1	oil Indicators:	-p ,		,				Indicators for Problematic Hydric
Histo			St	ipped Matr	ix (S6)			2 cm Muck - (A10) (LRR K, L, MLRA 149
☐ Histic Epipedon (A2) ☐ Dark Surface (S7) (LRR R, MLRA 149B)						Coast Prairie Redox (A16) (LRR K, L, F		
Black Histic (A3) Polyvalue Below Surface (S8) (LRR R, MLRA 149 E						_		
Hydrogen Sulfide (A4) Thin Dark Surface (S9) (LRR R, MLRA 149B)						Dark Surface (S7) (LRR K, L)		
Stratified Layers (A5) Loamy Mucky Mineral (F1) (LRR K, L)							Polyvalue Below Surface (S8) (LRR K,	
Depleted Below Dark Surface (A11) Loamy Gleyed Matrix (F2)							Thin Dark Surface (S9) (LRR K, L)	
Thick Dark Surface (A12) Depleted Matrix (F2) Depleted Matrix (F3)							Iron-Manganese Masses (F12) (LRR K, L,	
□ Sandy Mucky Mineral (S1) □ Redox Dark Surface (F6)							Piedmont Floodplain Soils (F19) (MLRA 149	
							Mesic Spodic (TA6) (MLRA 144A, 145, 149	
□ Sandy Gleyed Matrix (S4)   □ Depleted Dark Surface (F7)     □ Sandy Redox (S5)   □ Redox Depressions (F8)							$\square \text{ Red Parent Material (F21)}$	
							Very Shallow Dark Surface (TF12)	
<sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.							_ , , , ,	
		owed).						Other (Explain in Remarks)
	ve Layer (if obs	erveu):						Hydric Soil Present? Yes 🔟 No 🗌
Type:								
Depth (in	cnes):							
		present. H	ydric soils indic	ators Sandy	/ Redox (S	5) and Re	dox Dark Surfa	ice (F6) are satisfied.
YDROL								
Wetland	l Hydrology Indi	icators:						
Primary Indicators (minimum of one is required; check all that apply)							Secondary Indicators (minimum of two required	
Surface Water (A1)				Water-Stained Leaves (B9)				Surface Soil Cracks (B6)
High Water Table (A2)				Aquatic Fauna (B13)				Drainage Patterns (B10)
Saturation (A3)				Marl Deposits (B15)				Moss Trim Lines (B16)
Water Marks (B1)				Hydrogen Sulfide Odor (C1)				Dry-Season Water Table (C2)
Sediment Deposits (B2)				Oxidized Rhizospheres on Living Roots (C3)				Crayfish Burrows (C8)
Drift Deposits (B3)				Presence of Reduced Iron (C4)				Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4)				Recent Iron Reduction in Tilled Soils (C6)				Stunted or Stressed Plants (D1)
$\_$ Iron Deposits (B5)				Thin Muck Surface (C7)				Geomorphic Position (D2)
Inundation Visible on Aerial Imagery(B7) Other (Explain in Remarks)							Shallow Aquitard (D3)	
Sparsely Vegetated Concave Surface (B8)							FAC-Neutral Test (D5)	
_ <u></u> _ ope								Microtopographic Relief (D4)
Field Oh	servations:							
	Vater Present?	Yee	5 🗌 No 🗵		oth (inches	s).		Indicators of
	ble Present?				oth (inches			Wetland Hydrology Present?
	n Present?		s 🛛 No 🗌		oth (inches			Yes_ 🛛 🛛 No_
(includes	capillary fringe)				-	-		
Describe	Recorded Data (st	tream gaug	ge, monitoring,	well, aerial	photos, pro	evious insp	ections), if avai	ilable:
Remarks:	: Hole open for 2	hours. We	tland hydrolog	is present	and indica	ated. Heav	y rainfall (4.5 i	inches) 5 days prior and 0.3 inches two days prio
	ee Photo 33							



Photo 33. Data Point 25, view to the north.

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Appendix G. Field Photographs

CRYSTAL AIRPORT (MIC) AIRFIELD AND ASSOCIATED IMPROVEMENTS



Photo 1. South Perimeter Road, view to the east.



Photo 2. South Perimeter Road, view to the northwest.



**Photo 3**. Wetland 2. Data point 1, view to the northeast.



Photo 4. Wetland 1. Data point 3, view to the west.

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CRYSTAL AIRPORT (MIC) AIRFIELD AND ASSOCIATED IMPROVEMENTS



Photo 5. Runway 32L End. General, view to the northeast.

Photo 6. Runway 32R End. General infield, view to the east.



Photo 7. Taxiway connector. General infield, view to the southeast.



Photo 8. Taxiway connector. General infield, view to the northwest.

CRYSTAL AIRPORT (MIC) AIRFIELD AND ASSOCIATED IMPROVEMENTS

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Photo 9. North Perimeter Road. General infield, view to the north.



**Photo 10.** Non-aeronautical Development Area. General infield, view to the northeast.





Photo 12. Wetland 3. Data point 5, view to the east.

CRYSTAL AIRPORT (MIC) AIRFIELD AND ASSOCIATED IMPROVEMENTS



**Photo 13.** Non-aeronautical Development Area. Wooded drainage ditch, view to the south.



**Photo 14.** Non-aeronautical Development Area. Wooded drainage ditch, view to the north.

CRYSTAL AIRPORT (MIC) AIRFIELD AND ASSOCIATED IMPROVEMENTS

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**Photo 15.** Non-aeronautical Development Area. General infield, view to the north.



**Photo 16.** Non-aeronautical Development Area. General infield, view to the northeast.





e east. **Photo 18.** Wetland 5. Data points 10 and 11, view to the south.

Photo 17. Wetland 4. Data points 6 through 9. View to the east.

CRYSTAL AIRPORT (MIC) AIRFIELD AND ASSOCIATED IMPROVEMENTS

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Photo 19. Wetland 5. General, view to the south.



**Photo 20.** Wetland 5. General, view to the north.





Photo 22. Wetland 6. Data points 12 and 13. View to the west.

Photo 21. Wetland 6. Data points 12 and 13. View to the north.

CRYSTAL AIRPORT (MIC) AIRFIELD AND ASSOCIATED IMPROVEMENTS

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Photo 23. Wetland 6. Data points 14, 15, and 16. View to the west.

**Photo 24.** Wetland 6, General, view to the north.





Photo 26. Wetland 7. Data points 17, 18, and 19. View to the south.

Photo 25. Wetland 6, General, view to the south.

CRYSTAL AIRPORT (MIC) AIRFIELD AND ASSOCIATED IMPROVEMENTS

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Photo 27. Wetland 7. General, view to the west.







Photo 30. Data point 22, view to the north.

Photo 29. Data point 21, view to the north.

CRYSTAL AIRPORT (MIC) AIRFIELD AND ASSOCIATED IMPROVEMENTS

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**Photo 31.** Data point 23, view to the northwest.

**Photo 32.** Data point 24, view to the northwest.





Photo 34. Wetlands 1 and 2. Late season conditions, view to the east.

Photo 33. Data point 25, view to the north.

Appendix H. Delineator Qualifications

# BRAUNA HARTZELL, GISP GEOGRAPHIC INFORMATION SYSTEM (GIS)/IMAGE PROCESSING ANALYST

### **EXPERIENCE (GIS)**

Brauna Hartzell has more than 20 years of experience applying GIS software and database design techniques to support wetlands and water resources, historic preservation, community planning, transportation, aviation and military planning, and municipal infrastructure and storm water management. She has worked extensively with GIS and mapping software including ArcGIS desktop and ARC/INFO workstation and has specialized experience with 3D Analyst, Network Analyst and Spatial Analyst. She also collects environmental field data using hand-held GPS units and post-processes information for inclusion in databases and use in spatial analyses. Brauna collaborates with personnel from multiple disciplines to solve complex spatial problems through scripting and spatial analysis to deliver results and data for project-specific needs. She utilizes geoprocessing models, Python, and VBA to meet analytical needs of projects.

Brauna is experienced with GIS-related data submittal requirements associated with the Federal Energy Regulatory Commission (FERC) and the Federal Aviation Administration (FAA) data standardization initiatives. She has extensive experience developing Geodatabases with the Spatial Data Standards for Facility, Infrastructure, and Environment (SDSFIE) standard and creating Federal Geographic Data Committee (FGDC)-compliant metadata.

Brauna has specialized experience with using 3D data formats for spatial analysis, contour generation and manipulation, and geospatial modeling. She is adept in the use of LiDAR-derived data and DTMs in support of hydrology and hydraulic analyses. Additionally, she has extensive experience with SSURGO databases and the National Hydrography Dataset.

## EXPERIENCE (WETLAND/ENVIRONMENTAL)

Brauna Hartzell has more than fifteen years of experience in wetland delineation, wetland permitting, and restoration projects. She performs wetland and field delineations conforming to current United States Army Corps of Engineers (USACE) including the Northcentral and Northeast Regional Supplement and State standards, designs custom field data collection applications, collects field data using hand-held Global Positioning Systems (GPS) data collectors and tablets, and prepares National Environmental Policy Act (NEPA) documentation. Brauna has successfully guided numerous projects through the Section 404 permitting process.

Brauna has performed numerous wetland delineations in the Upper Midwest. She conducts wetland mitigation site monitoring according to established site-specific assessment protocols, performs vegetation surveys, and analyzes and presents field collected data in graphical and tabular form. She also assists in mitigation site design and construction specifications development.



#### Areas of Expertise

- Geographic Information Systems (GIS)
- Remote-sensing image processing
- Digital mapping
- Database design
- Programming
- Wetland delineation and permitting

#### Education

- MS, Environmental Monitoring, 1994, University of Wisconsin, Madison
- BS, Biological Science, 1982, Florida State University, Tallahassee, Florida

#### **Registration/Certification**

 Certified GIS Professional (GISP), GIS Certification Institute

#### Training and Seminars

- Building Web Applications Using the ArcGIS API for Flex, ESRI
- Geodatabase Design Concepts, ESRI
- Grasses, Sedges, and Rushes Workshop, University of Wisconsin– LaCrosse, 2017
- Vascular Flora of Wisconsin, University of Wisconsin – Madison, Spring 2002
- Wetlands Ecology, University of Wisconsin – Madison, Spring 2003
- Grasses: Identification and Ecology Workshop, University of Wisconsin – Milwaukee workshop, 2002
- GPS Field Collection Techniques Training Workshop for Trimble GeoXH, Seiler Instruments
- Basic Wetland Delineation Workshop, University of Wisconsin–LaCrosse, 2002
- Basic Hydric Soil Identification Workshop, University of Wisconsin – LaCrosse, 2005
- Advanced Wetland Delineation Workshop, University of Wisconsin – LaCrosse, 2007
- Critical Methods in Delineation, University of Wisconsin-LaCrosse, 2007, 2008, 2009, and 2017
- Wildlife Inventory and Monitoring, University of Wisconsin – Milwaukee workshop, 2015

# Mead Hunt

# **BRAUNA HARTZELL, GISP (CONTINUED)**

### **RELATED PROJECTS (WETLANDS)**

#### Wetland Delineations Various Clients Midwest USA

Brauna performed wetland delineations in accordance with the Routine On-Site Method of 1987 United States Army Corps of Engineers (USACE) wetland delineation manual at various sites in Wisconsin and Minnesota. Work included conducting the delineation, documenting field investigations and site conditions, creating wetland boundary maps, and report writing. Delineations were performed for the following projects:

- Pellet Subdivision Middleton, Wisconsin, 2002
- Potter's Creek Subdivision Green Bay, Wisconsin, 2003
- Oak Street Bridge Design La Crosse, Wisconsin, 2003
- Winona Municipal Airport Winona, Minnesota, 2003 & 2009
- State Trunk Highway (STH) 29 Marathon County, Wisconsin, 2003
- Hampton Heights Subdivision Ledgeview, Wisconsin, 2004
- County Trunk Highway (CTH) W Oconto County, Wisconsin, 2004
- Town of Rockland Preliminary Plat Brown County, Wisconsin, 2004
- Mourning Dove Subdivision Oconto County, Wisconsin, 2004
- Cinnamon Ridge Subdivision Suamico, Oconto County, Wisconsin, 2004
- Kenosha Regional Airport Kenosha, Wisconsin, 2005
- County Trunk Highway (CTH) A Lincoln County, Wisconsin
- CTH D Vernon County, Wisconsin, 2006
- Burton Street Beloit, Wisconsin, 2006
- Central Wisconsin Airport Mosinee, Marathon County, Wisconsin, 2008
- State Trunk Highway (STH) 67, Fond du Lac County, Wisconsin, 2011
- Interstate Highway 90/94 Corridor Study, 2014 & 2015
- Ontonagon County Airport, Ontonagon County, Michigan, 2016
- Central Wisconsin Airport Mosinee, Marathon County, Wisconsin, 2016
- Little Rock Lake, Vilas County, Wisconsin, 2016
- Green Bay-Austin Straubel International Airport, 2017
- Lake Elmo Airport, Lake Elmo, Minnesota, 2017
- STH 48/US 53 Interchange, Rice Lake, Wisconsin, 2017

#### Joint Section 404 – WCA Permit and Compensatory Mitigation Plan, 2017 Detroit Lakes-Becker County Airport Detroit Lakes, MN

The proposed project at the Airport includes a relocation of the Runway 13 threshold 1,000 feet to the southeast to provide a 5,200-foot long runway which accommodates an instrument approach with CAT-I minimums. Additionally, a full-length taxiway will be constructed. In total, the proposed project will address airfield design deficiencies, improve runway pavement condition, and meet runway length requirements. Approximately 14 acres of wetland fill will be necessary to achieve project needs. A compensatory mitigation plan is included in the permit application. Brauna served as the lead preparer of the permit application.

#### Past Employment

- Information Management Systems, Inc.
- Adult Communities Total Services, Inc.
  - Archeological Assessments, Inc.
  - University of Wisconsin Madison

#### No. of Years With Mead & Hunt

Hired 08/28/1992

#### No. of Years With Other Firms

Four

## BRAUNA HARTZELL, GISP (CONTINUED)

#### Wetland Delineation, Lake Elmo Airport, 2017 Metropolitan Airports Commission Lake Elmo, Minnesota

Brauna served as lead wetland delineator in support of alternatives analysis for an environmental assessment for a proposed runway relocation and associated improvements. The area of interest is approximately 130 acres is size and resulted in the delineation of nine wetlands, one of which was in agricultural production. Wetland types encountered include: shallow marsh, fresh wet meadows, and shrub swamps. A functional assessment was performed using the MN Rapid Assessment Method (MNRAM), updating existing information and assessing newly delineated wetlands.

#### Wetland Delineation, Green Bay-Austin Straubel International Airport, 2017 Wisconsin Bureau of Aeronautics Brown County, Wisconsin

Brauna served as lead wetland delineator in support of an environmental assessment for a proposed expansion to the East General Aviation apron and regrading associated with Runway 6/24. The area of interest is approximately 65 acres is size, covering airport infield areas, which resulted in the delineation of 23 emergent wet-meadow wetlands.

#### Wetland Delineation, STH 48/US 53 Interchange Improvements, 2017 Wisconsin Department of Transportation Rice Lake, Wisconsin

Brauna served as the lead wetland delineator in support of permitting for interchange improvements to address safety, geometric and operational deficiencies, and improve facilities for non-motorized traffic. The area of interest is approximately 17.5 acres in size and resulted in the delineation of nine wetlands. Wetland types encountered include: fresh wet meadows and ditch wetlands.

#### Wetland Delineation, Ontonagon County Airport, 2016 Michigan Bureau of Aeronautics Ontonagon County, Michigan

Brauna served as the lead wetland delineator in support of permitting and on-site mitigation activities related to proposed wetland disturbance in another area of the airport. The area of interest is approximately 19.4 acres in size and resulted in the delineation of 11 wetlands in areas previously in agricultural production. Brauna also performed groundwater well monitoring and data analysis in support of mitigation site design.

### Wetland Delineation, Central Wisconsin Airport, 2016 Wisconsin Bureau of Aeronautics

#### Mosinee, Marathon County, Wisconsin

Brauna served as the lead wetland delineator in support of master planning activities related to determining the viability of shifting Runway 17/35 to the south. The area of interest is approximately 70 acres in size and resulted in the delineation of three large wetlands on airport property and two off-site. The three on-site wetlands experience regular mowing and other maintenance activities as well as show evidence of groundwater contact on a sloping terrain with a seasonal high-water table; off-site wetlands consisted of an alder and a hardwood swamp.

# Mead Hunt

## BRAUNA HARTZELL, GISP (CONTINUED)

#### Little Rock Lake Wetland Survey, 2016 National Ecological Observatory Network (NEON), Boulder, CO Vilas County, Wisconsin

Brauna served as the lead wetland scientist in support of site equipment layout investigations for long-term ecological monitoring. A total of four wetlands were delineated within the area of interest at this mesotrophic seepage lake covering about 39 acres. Each proposed equipment installation site was surveyed and wetlands delineated in close proximity to any proposed location.

#### Interstate Highway (IH) 90/94 Corridor Study, 2013-2017 Wisconsin Department of Transportation (WisDOT) Southwest Region Portage, Juneau, Sauk, and Columbia Counties, Wisconsin

Mead & Hunt is leading a team that is conducting a corridor study of IH 90/94 from US12/WIS 16 to IH39. The project consists of evaluating operational and safety issues, review of the interchanges and ramps within the corridor, and evaluating possible expansion. Environmental studies are being conducted and include; cultural resources surveys, endangered species surveys, contaminated material investigations, noise analysis and wetland delineations. Brauna is a wetland scientist assisting in the delineation, wetland field data collection and mapping. Cost: \$210 million

#### STH 67 Resurfacing Design and Environmental Documentation, 2011 Wisconsin Department of Transportation (WisDOT) Northeast Region Fond du Lac County, Wisconsin

Mead & Hunt lead redesign of this 20 mile corridor of STH 67 spanning Fond du Lac County through both rural and developed sections. In support of environmental documentation, a wetland delineation was performed within the right-of-way for the 20 mile corridor. Wetland types encountered include: shallow marsh, fresh wet meadows, shrub swamps, and riparian wetlands. In total, 69 wetlands were delineated. Brauna assisted with wetland delineation and survey, mapping and data management.

#### Wetland Mitigation, Runway 14/32 Safety Area, 2004-2011 WisDOT Bureau of Aeronautics Madison, Wisconsin

Brauna served as project scientist for this reconstruction of a runway safety area and railroad within a state natural area. 140 acres of fen and sedge meadow were restored and enhanced, and 6,000 feet of Starkweather creek was restored with an annually flooded riparian corridor. The project also included restoration of ten acres of swamp forest and 35 acres of upland buffer, plus negotiation of annual management and monitoring to enhance rare plant habitats within Cherokee Fen. The mitigation cost was more than \$1.5 million, with a total project construction cost of \$25 million. Brauna assisted with wetland monitoring and collection of botanical and hydrologic data for compliance. She also monitored for invasive species.

# Mead

## KIMBERLY SHANNON ENVIRONMENTAL SCIENTIST

Kimberly Shannon is an environmental scientist with over a decade of experience. Over the years she has gained professional experience in coordinating and completing a variety of project types including oil and gas, electric transmission, nuclear, transportation, commercial development, and local government. She has honed her regulatory and technical skills while providing excellent service to diverse clients. Her technical expertise and strongest skills as a consultant include the identification, mapping, and delineation of streams and wetlands; 404 permitting and compensatory mitigation; United States Army Corps of Engineers (USACE) coordination, and assisting various clients through the 404 permitting process. Kimberly also has professional experience in the preparation and coordination of environmental assessment and categorical exclusion documents in support of the National Environmental Policy Act (NEPA) process, habitat evaluation for threatened and endangered species, proposal writing and pricing, technical writing and editing, training junior staff, and working with project managers, colleagues and clients to achieve project goals and objectives in a timely and cost effective manner. She coordinates with subcontractors and science/environmental staff in offices across the country to complete field work, reports, permits, and data deliverables.

## **RELATED PROJECTS**

#### Mitigation Coordination for Oklahoma Department of Transportation (ODOT) with Multiple Agencies, EC 1660, 2015-present ODOT

#### Statewide, Oklahoma

Kimberly is assisting ODOT with the coordination of various mitigation projects across Oklahoma. As part of this contract she is working directly with the USACE, other consultants, and the Oklahoma Chapter of The Nature Conservancy, a key mitigation partner for ODOT. Assisting TNC with production of a mitigation master plan for TNC's Oka' Yanahli Preserve in Pontotoc County, OK.

Kimberly's years of various environmental project experience includes:

- Waters re-evaluations and mitigation plans ODOT
- Mitigation plan for Durant Bypass ODOT
- Local government contract for statewide county road and bridge projects ODOT
- BNSF Railroad separation EA ODOT
- Delineations, 404 permitting, and mitigation planning in Texas and Oklahoma QuikTrip
- Natural gas liquids trunk line right of way assessments, reports and 404 permitting in OK, KS, TX, CO included over 400 miles and 1,000 waterbodies assessed – DCP Midstream, LLC
- Wetland delineations and site spot checks in Uintah Basin, Utah; Senior delineator for site-specific survey on Ute and Ouray Reservation – Constellation Energy Partners (CEP)
- Section 7 consultation and biological assessment (BA) for the American Burying Beetle in Tulsa, OK – Tulsa Botanic Garden



#### Areas of Expertise

- Permitting and licensing
- NEPA
- Public involvement
- Regulatory compliance
- Environmental Assessments
- Environmental Reports
- Stream and wetland delineation

#### LinkedIn url

https://www.linkedin.com/pub/kimberlyshannon/29/412/a38

#### Education

- MS, Applied and Natural Science, Oklahoma State University, 1997
- BS, Biology, Oklahoma State University, 1994
- Certificate, GIS, Tulsa Community College, 2010

#### **Training and Seminars**

- "Permitting and Training," Federal Energy Regulatory Commission (FERC), 2013
- "Advanced Problems in Hydric Soil Evaluation," North Carolina State University, 2010
- "Contractor Orientation Safety Course," Burlington Northern Santa Fe Railroad (BNSF), Union Pacific Railroad (UPRR), 2009
- "Regional Supplement Seminar," Wetland Training Institute, 2008

#### Presentations

- NEPA Updates for Oklahoma, Wallace Engineering, 2009
- Panel Presentation: Careers in the Frontier of the Environment, Women in Science Conference, 2008
- Panel Presentation: Landowner Relationships, Natural Areas Associations Conference, 2004

#### Past Employment



# **KIMBERLY SHANNON (CONTINUED)**

- Delineations, habitat assessments, vegetation mapping, aquatic ecology surveys, and NRC site audits in support of COL application and ER Luminant Generation Company – Comanche Peak Nuclear Power Plant, Glen Rose, TX
- Coordinated staff for weeks of biological monitoring of seismic drilling and receiver line crews at Tishomingo – NWR Chesapeake Energy

#### Ontonagon County Airport, 2016 Michigan Bureau of Aeronautics Ontonagon County, Michigan

Kim served as a wetland delineator in support of permitting and on-site mitigation activities related to a proposed wetland disturbance in another area of the airport. The area of interest spans approximately 19.4 acres and resulted in the delineation of 11 wetlands in areas previously in agricultural production. Kim also assisted groundwater well monitoring in support of mitigation site design.

#### Waters Re-Evaluations and Mitigation, 2009-January 2010 Oklahoma Department of Transportation (ODOT) Statewide, Oklahoma

Kimberly assisted with multiple re-evaluations of potentially jurisdictional waterbodies related to bridge replacement projects across Oklahoma. Delineation reports, 404 permits, and mitigation plans were prepared for the ODOT. *This project was completed while Kimberly was employed with another firm.* 

### Mitigation Projects, 2009-2015 Oklahoma Department of Transportation (ODOT) Statewide, Oklahoma

Kimberly prepared compensatory mitigation plans for 404 Permit Applications in support of ODOT road and bridge improvement projects across Oklahoma. She conducted and coordinated site assessments, site selection, landowner correspondence and coordination, site planning, agency coordination, and monitoring plans for multiple mitigation projects.

#### Mitigation Plan, Durant Bypass, May 2010-2015 Oklahoma Department of Transportation (ODOT) Durant, Oklahoma

Kimberly prepared a compensatory mitigation plan for a 404 permit in support of the ODOT's bypass loop around US70 in Durant, Oklahoma. She coordinated with the United States Army Corps of Engineers (USACE), ODOT, subcontractors, and the City of Durant during the project.

## Delineation, Reporting, and 404 Permitting, November 2011-April 2012 QuikTrip

#### **Dallas/Fort Worth Metroplex, Texas**

Kimberly led and completed multiple delineations, protected species habitat evaluations, reporting efforts, and 404 permitting (NWP39) including mitigation bank and agency coordination for the client. *This project was completed while Kimberly was employed with another firm.* 

- Kleinfelder
- Enercon Services
- George M. Sutton Avian Research Center
- Oklahoma Biological Survey
- Tulsa Community College
- Oklahoma Chapter of the Nature Conservancy

#### No. of Years With Mead & Hunt

Hired 05/04/2015

#### No. of Years With Other Firms

**1**0



## **KIMBERLY SHANNON (CONTINUED)**

## Delineation, Reporting, and 404 Permitting for 72-TC, May 2014-September 2014 QuikTrip Corporation

### Muskogee, Oklahoma

Kimberly coordinated and completed the delineation, protected species habitat evaluations, reporting efforts, and 404 permitting (NWP39) including mitigation plan preparation and agency coordination for the client. *This project was completed while Kimberly was employed with another firm.* 

#### Local Government Contract for Statewide County Road and Bridge Projects Oklahoma Department of Transportation (ODOT) Statewide Oklahoma

These similar county-level projects included the delineation of potentially jurisdictional waterbodies, assessment of potential habitat for federally protected species, reporting efforts, the completion of project specific National Environmental Policy Act (NEPA) clearance documents, tribal coordination, and coordination with Oklahoma Department of Transportation (ODOT) contacts and county commissioners. Kimberly assisted with the coordination and completion of field assessments and related reports in support of the Categorical Exclusion (CE) documents. She also coordinated report review with ODOT and preparation of the CE report. *This project was completed while Kimberly was employed with another firm.* 

# Southern Hills Natural Gas Liquids Trunk Line ROW Assessments, Reports and 404 Permitting, December 2011-July 2012

DCP Midstream, LLC

# Meade County, Kansas and Beaver, Harper, Woodward, Major, Blaine, Kingfisher, Logan, Oklahoma, Lincoln, and Pottawatomie Counties, Oklahoma

Kimberly reviewed and classified over 500 waterbodies along approximately 260 miles of pipeline right-of-way. She reviewed all right-of-way feature maps and coordinated field data for the presence of potentially jurisdictional waters and potential threatened and endangered species habitat for a large trunk line pipeline in Oklahoma. Kimberly classified and coordinated mapping efforts with GIS professionals and the client to assist with horizontal directional drilling (HDD) boring locations in order to avoid or minimize impacts to jurisdictional waterbodies. These data were used to complete delineation reports, 404 permitting (NWP12) and to prepare engineering alignment sheets. As appropriate, Kimberly coordinated directly with the Tulsa and Fort Worth District Regulatory Branch of the United States Army Corps of Engineers for the timely completion and issuance of NWP12. She worked directly with the client's environmental project manager to assist with reroutes and attended alignment sheet review meetings. *This project was completed while Kimberly was employed with another firm.* 

#### Southern Hills Natural Gas Liquids Lateral Lines Right-of-Way Assessments, Reports and 404 Permitting, March-August 2012 DCP Midstream, LLC

#### Woodward, Woods, Major, Logan, and Lincoln Counties, Oklahoma

Kimberly classified over 300 waterbodies along approximately 88 miles of pipeline rightof-way. She reviewed all right-of-way feature maps and coordinated field data for the presence of potentially jurisdictional waters and potential threatened and endangered species habitat for multiple lateral pipelines in Oklahoma. Kimberly classified and coordinated mapping efforts with GIS professionals and the client to assist with horizontal directional drilling (HDD) boring locations in order to avoid or minimize impacts to jurisdictional waterbodies. These data were used to complete delineation



## **KIMBERLY SHANNON (CONTINUED)**

reports, 404 permitting (NWP12) and to prepare engineering alignment sheets. As appropriate, Kimberly coordinated directly with the Tulsa and Fort Worth District Regulatory Branch of the United States Army Corps of Engineers for the timely completion and issuance of NWP12. She worked directly with the client's environmental project manager to assist with reroutes and attended alignment sheet review meetings. *This project was completed while Kimberly was employed with another firm.* 

# Chitwood/Sholem Lateral Pipeline Right-of-Way Assessments, Reports and 404 Permitting, April-August 2012

#### DCP Midstream, LLC

#### Jefferson County, Oklahoma and Clay and Jack Counties, Texas

Kimberly classified over 189 waterbodies along approximately 31.5 miles of pipeline right-of-way. She reviewed all right-of-way feature maps and coordinated field data for the presence of potentially jurisdictional waters and potential threatened and endangered species habitat for multiple pipelines in Oklahoma and Texas. Kimberly classified and coordinated mapping efforts with GIS professionals and the client to assist with horizontal directional drilling (HDD) boring locations in order to avoid or minimize impacts to jurisdictional waterbodies. These data were used to complete delineation reports, 404 permitting (NWP12) and to prepare engineering alignment sheets. As appropriate, Kimberly coordinated directly with the Tulsa and Fort Worth District Regulatory Branch of the United States Army Corps of Engineers for the timely completion and issuance of NWP12. She worked directly with the client's environmental project manager to assist with reroutes and attended alignment sheet review meetings. *This project was completed while Kimberly was employed with another firm.* 

## Wetland Delineations and Site Spot Checks, May-September 2014 Constellation Energy Partners (CEP)

#### Uintah Basin, Utah

Kimberly worked in the Uintah Basin in northeast Utah on multiple occasions to assist as a Senior Delineator for site-specific waters and wetlands delineations, section block (square mile) surveys, and site spot checks for waterbodies on the Ute and Ouray Reservation. *This project was completed while Kimberly was employed with another firm.* 

## Biological Assessment (BA) for the American Burying Beetle, 2007-2008 Tulsa Botanic Garden

#### Tulsa, Oklahoma

In response to a federal nexus via a nationwide permit application for the construction of a dam at the Oklahoma Centennial Botanical Gardens, Kimberly prepared a biological assessment in response to Formal Section 7 Consultation with United States Fish and Wildlife Service for the American Burying Beetle. *This project was completed while Kimberly was employed with another firm.* 

### Wetland Inventory, 2006-2007 Camp Gruber Maneuver Training Center Muskogee County, Oklahoma

As directed by EO 11990, Kimberly was part of a team that assessed the Camp Gruber site for new wetlands and verification of previously identified wetlands, included delineation of waterbodies subject to the jurisdiction of the United States Army Corps of Engineers (USACE). *This project was completed while Kimberly was employed with another firm.* 

