

WETLANDS DELINEATION TECHNICAL REPORT
FOR THE
6TH AVENUE PARKWAY EXTENSION
ENVIRONMENTAL ASSESSMENT

Prepared for:
City of Aurora
15151 E Alameda Parkway, Suite 3200
Aurora, CO 80012

Prepared by:
Felsburg Holt & Ullevig
6300 S Syracuse Way, Suite 600
Centennial, CO 80111

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LIST OF ACRONYMS

AFB.....	Air Force Base
CWA	Clean Water Act
E-470	E-470 Tollway
EA.....	Environmental Assessment
FHU	Felsburg Holt & Ullevig
FHWA	Federal Highway Administration
GIS	Geographic Information Systems
LiDAR	Light Detecting and Ranging Technology
NRCS	Natural Resource Conservation Service
NWI.....	National Wetlands Inventory
OHWM.....	Ordinary High Water Mark
RPW	Relatively Permanent Water
SH 30	State Highway 30
TCGC	Triple Creek Greenway Corridor
TNW	Traditional Navigable Water
USACE	U.S. Army Corps of Engineers
USFWS.....	U.S. Fish and Wildlife Service
WUS	Waters of the U.S.

1. INTRODUCTION

This technical report has been prepared in support of the 6th Avenue Parkway Extension Environmental Assessment (EA) extending 6th Avenue from State Highway 30 (SH 30) to the E-470 Tollway (E-470). This technical report evaluates the effects of the Proposed Action and the No Action Alternative with respect to wetlands.

1.1 Proposed Action

The Proposed Action would extend the 6th Avenue Parkway for approximately 2 miles along a new alignment, connecting existing 6th Avenue/SH 30 to the west with the existing 6th Avenue Parkway at E-470 to the east. This would close a gap in the existing major arterial street system, reducing out of direction travel and improving the efficiency and reliability of the transportation system. The Proposed Action would be a six-lane arterial roadway with a raised median and sidewalks.

Six initial alternatives were developed and screened through three screening levels to identify the Proposed Action. The alternatives screening is summarized in **Appendix A1 Alternatives Technical Report** of the EA. Details of the Proposed Action are presented in **Appendix A2 Conceptual Design Plans** of the EA.

The Proposed Action is shown on **Figure 1**. Major elements of the Proposed Action are identified by number from west to east on **Figure 1**, and include the following:

Element 1. Tie into existing 6th Avenue/SH 30: 6th Avenue/SH 30 is an existing two-lane arterial. At the western end of the Proposed Action, a signalized “thru-tee” type intersection would be constructed connecting the Proposed Action roadway to existing 6th Avenue/SH 30. This new signalized intersection would include bypass lanes for the eastbound SH 30 through movement or a thru-tee signalized intersection with bypass lanes for both the eastbound SH 30 through movement. The tie-in would be an urban curb and gutter section with three 12-foot travel lanes in each direction to connect to future 6-lane section to the west. A 10-foot sidewalk would be located on both the north and south sides of the roadway.

Element 2. Triple Creek Trail realignment and connections: A portion of the existing Triple Creek Trail would be realigned and would pass beneath the Proposed Action roadway which would be on a bridge at this location (see Element 3 in **Figure 1**). The Triple Creek Trail would be connected to 6th Avenue via a spur trail to the sidewalk constructed along the south side of the new roadway. The Triple Creek Trail is a 10-foot wide soft surface trail that serves equestrians, bicyclists and pedestrians. The realigned portion would match the existing width and surface. A 10-foot sidewalk on both sides of the bridge (Element 3) would provide connections to the trail. The southern terminus of the trail is currently at the Coal Creek Arena, and further extension to the south is planned by the City of Aurora.

Element 3. Roadway bridge over Sand Creek: Immediately east of the new intersection with existing 6th Avenue/SH 30 (Element 1 in **Figure 1**), the roadway would be elevated onto a six-lane bridge crossing over Sand Creek and its associated floodplain/floodway, and over the Triple Creek Trail. The bridge length and profile would be set to minimize impacts to Sand Creek, while still providing a minimum 10-foot vertical clearance over the Triple Creek Trail. The bridge would have a median and sidewalks. The bridge would be approximately 680 feet in length with 5 variable length spans supported on four piers. The bridge would be

designed to be compatible with the surrounding environment and to allow wildlife connectivity along Sand Creek and the Triple Creek Trail.

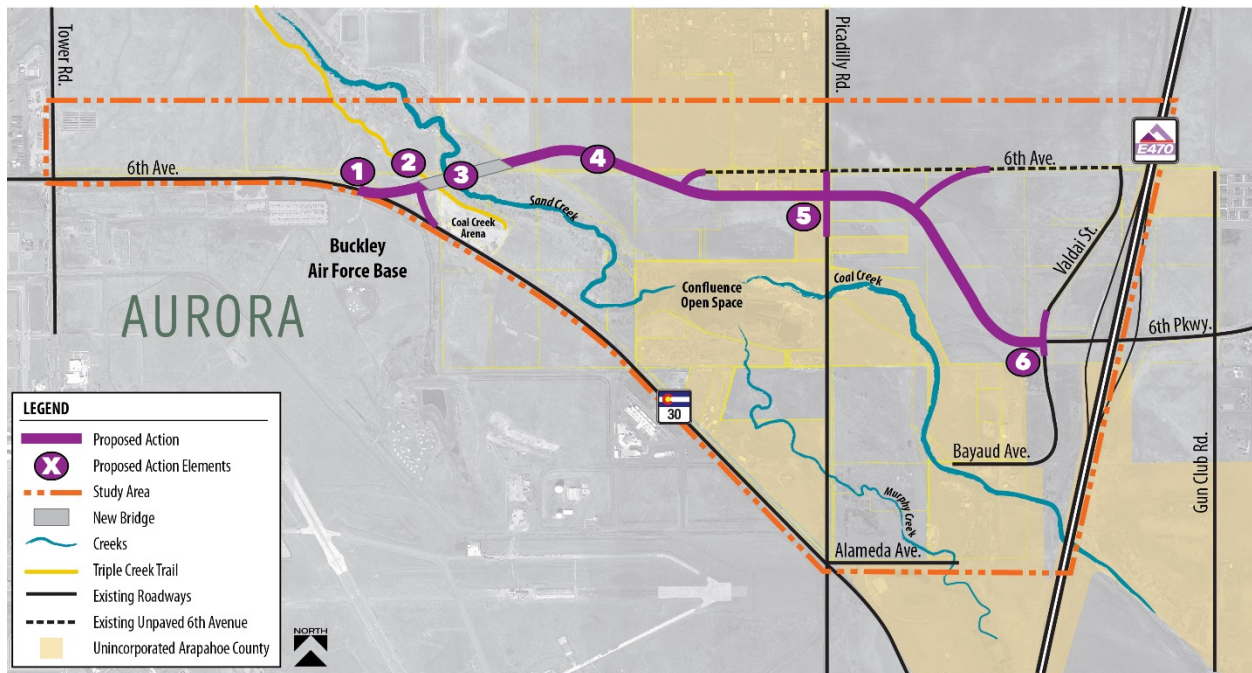
Element 4. 6th Avenue Parkway arterial roadway: The 6th Avenue Parkway extension would consist of a 144-foot wide, six-lane arterial roadway (three lanes in each direction) with a raised vegetated median. There would be curb and gutter and 10-foot wide sidewalks on the north and south sides of the roadway. The Proposed Action would provide two new access connections from the Proposed Action to two existing portions of 6th Avenue. One of these connections would provide access to the existing residences along unpaved 6th Avenue, west of Picadilly Road. The second connection would extend northeast from the Proposed Action to unpaved 6th Avenue to areas planned for development east of Picadilly Road.

Element 5. Intersection with Picadilly Road: The Proposed Action roadway would cross Picadilly Road, which is an existing north-south road. A signalized intersection would be constructed at this location. Picadilly Road is currently two lanes, but the City of Aurora anticipates that expansion to six lanes would occur in the future as a different project. Therefore, the intersection would be configured such that future expansion of Picadilly Road to six lanes can be accommodated and is not precluded.

Element 6. Tie into existing 6th Avenue Parkway at E-470: On its eastern end, the Proposed Action roadway would tie into the existing E-470 interchange, which currently truncates at this location, forming a connection with the existing 6th Parkway to the east of the interchange. The intersection tie-in at Valdai Street and 6th Avenue Parkway would be signalized. This connection would allow access from the west via the Proposed Action to the E-470 interchange and to the existing 6th Avenue Parkway extending to the east of E-470.

In addition to these transportation elements, the Proposed Action would include permanent roadway stormwater drainage with water quality features for roadway runoff and accommodate offsite stormwater flows. Details of drainage and water quality features are presented in **Appendix A6 Floodplains and Drainage Assessment Technical Report** of the EA.

Figure 1 Proposed Action and Study Area



Note: Numbers in graphic correspond with text above.

1.2 No Action Alternative

If the Proposed Action is not selected for implementation, there would be no improvements made to 6th Avenue beyond the existing and committed transportation system. The No Action Alternative was carried forward as a baseline comparison for environmental analysis purposes.

2. DELINEATION APPROACH

2.1 *Preliminary Desktop Review*

Prior to engaging in on-site field surveying activities, a desktop review was conducted to determine potential presence of wetlands and other waters of the US (WUS) in the study area. Utilizing National Wetlands Inventory (NWI) data from the U.S. Fish and Wildlife Service (USFWS), several hydrologic features were depicted throughout the project site. These features include freshwater emergent wetlands, freshwater ponds and riverine areas (**Figure 2**).

The majority of these features appear aggregated near the center of the study area, where the convergence of Murphy Creek and Coal Creek occur. This convergence zone is also the site of previous disturbance from surface mining activities, giving rise to bodies of surface water from exposed groundwater. At this location, Murphy Creek and Coal Creek join to become Sand Creek, which meanders northwest out of the study area. According to current data, pockets of potential wetlands appear to exist along this stretch of Sand Creek, most notably just north of the Coal Creek Arena.

In addition to NWI data, a topographical inspection was performed through use of Light Detecting and Ranging technology (LiDAR) (**Figure 3**). Given that multiple drainage ways occur in the study area, this analysis provides a better understanding of site drainage patterns by displaying the possible stream channel Ordinary High Water Mark (OHWM) associated with changes in slope. Those drainage areas that express a clear “bed and bank” and have an observable drainage condition can, and typically are, noted as WUS and fall under regulatory protection. However, while a review of the LiDAR data can help in locating these areas, it is not always accurate and field surveys are required to identify accurate locations of wetlands and the OHWM.

These preliminary reviews identified areas for Felsburg Holt & Ullevig (FHU) staff to focus wetland delineation efforts in the field.

Figure 2 USFWS National Wetland Inventory Map

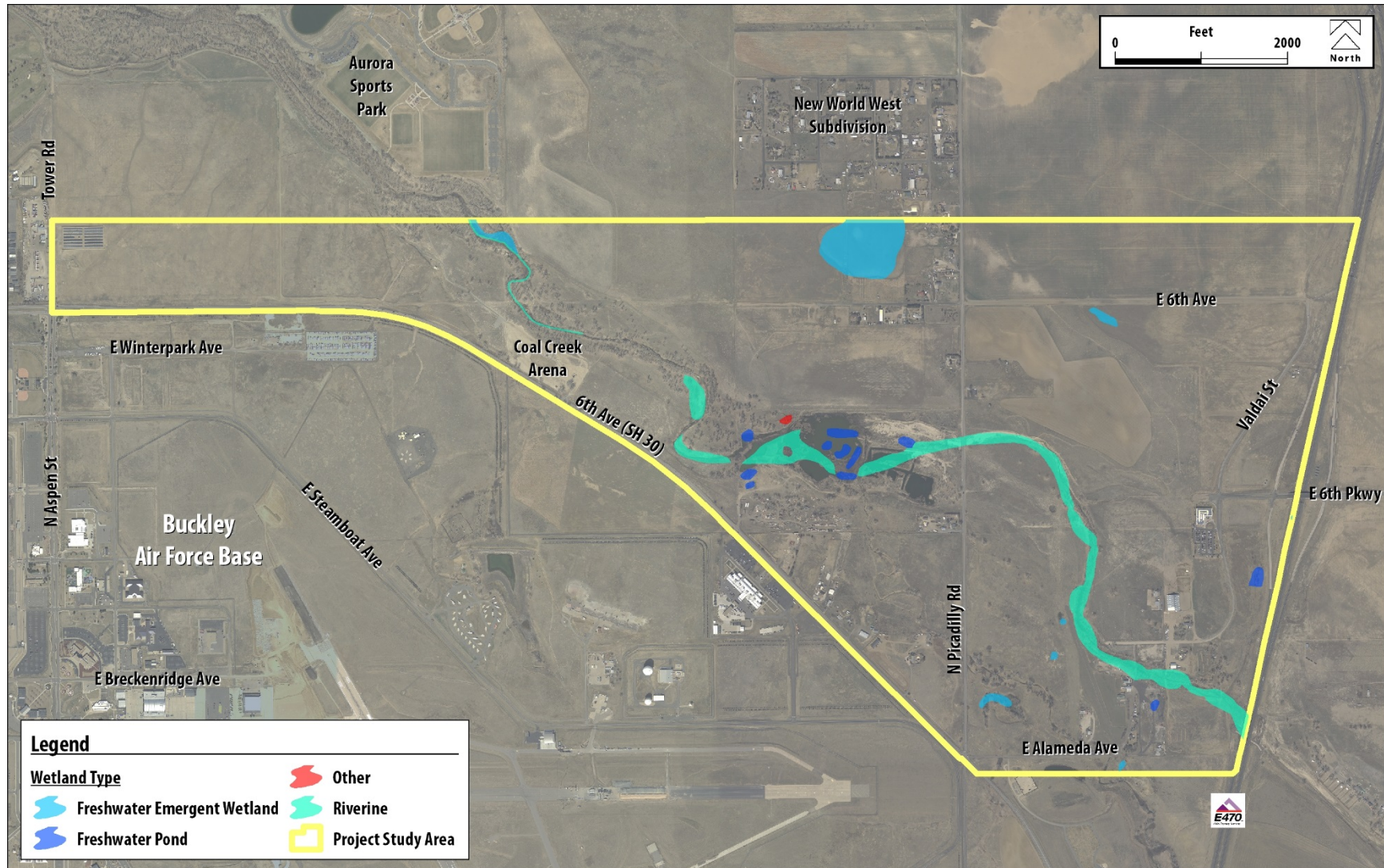
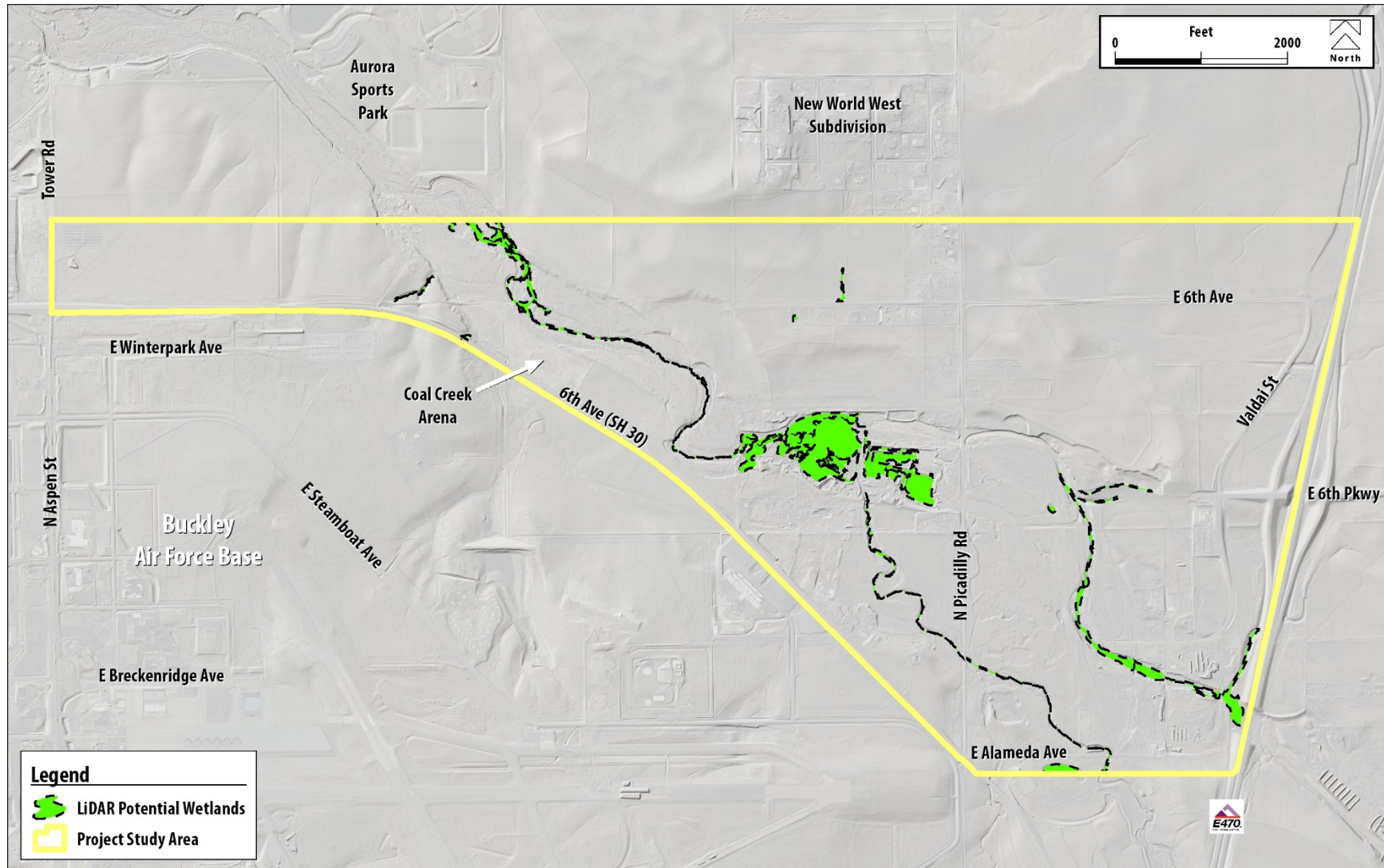


Figure 3 LiDAR Wetland Inventory Map



2.2 On-Site Wetland Delineation

In support of this EA, Keith Hidalgo, Certified Ecologist, and Jake Lloyd, both Environmental Scientists with FHU, performed wetland delineations on March 16 - 17, 2015 and July 17, 2015. Wetlands identified in the field during these three days were documented using the latest Wetland Determination Forms from the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region* (Version 2) (USACE, 2010). A Trimble® GeoXH™ GNSS with ESRI's® ArcPad™ version 10.x mobile Geographic Information System (GIS) was used to delineate wetland boundaries. The boundaries that have been delineated are shown on **Figure 4**, **Figure 5**, and **Figure 6**. Site photographs included in **Appendix A** illustrate field conditions at the time of the surveys.

2.3 Cowardin Classifications for the Site

The site wetlands provide a range of classifications under the Cowardin classification system (Cowardin et al., 1979), as identified in the NWI Mapper tool (USFWS, 2014). FHU's staff reviewed the NWI classifications during the field surveys of the study area and identified each wetland's Cowardin classification in **Section 4**.

3. SITE SETTING AND CONDITIONS

The study area is located within the City of Aurora and unincorporated Arapahoe County, Colorado, at approximately 5,600 feet above sea level. The study area is in the western-most edge of the Flat to Rolling Plains of the High Plains level 4 ecoregion (USEPA, 2003). This ecoregion is described as:

“More level and less dissected than the adjacent Moderate Relief Plains. Soils are generally silty with a veneer of loess. Dryland farming is extensive, with areas of irrigated cropland scattered throughout the ecoregion. Winter wheat is the main cash crop, with a smaller acreage in forage crops.” (USEPA, 2003).

Generally, the study area is located to the northeast of the Buckley Air Force Base (AFB), west of high- and low-density single-family residences and commercial businesses, west of E-470 and surrounding agricultural lands, north of agricultural lands, and southeast of recreational ball fields, agricultural lands and single-family residences. The natural characteristics of this ecoregion have been replaced by development; however, the blue grama-buffalo grass (*Bouteloua gracilis* – *Bouteloua dactyloides*) association was observed in many upland areas around the study area. The natural vegetation in the study area consists primarily of native and non-native grasses, weedy forbs, shrubs and trees throughout the Triple Creek Greenway Corridor (TCGC) and in the open areas in and adjacent to the study area.

Vegetation in the study area includes native trees, shrubs, and grasses, along with non-native weeds. Wetland plant species exist along the TCGC, and upland plant species exist in the surrounding open lands. Generally, cover types primarily consist of various native and non-native woody and herbaceous species including: plains cottonwood (*Populus deltoides*), black locust (*Robinia pseudoacacia*), sandbar willow (*Salix interior*), rubber rabbitbrush (*Ericameria nauseosa*), chokecherry (*Prunus virginiana*), American plum (*Prunus americana*), common snowberry (*Symphoricarpos albus*), smooth brome (*Bromus inermis*), and Scotch thistle (*Onopordum acanthium*). Upland tree species included non-native ornamental and noxious trees. The non-native and noxious trees observed in the field include Russian olive (*Elaeagnus angustifolia*) and Siberian elm (*Ulmus pumila*). This vegetation is un-impaired and has relatively high quality because of the presence of Sand Creek, Coal Creek, Murphy Creek, un-named tributaries and the lack of overall development surrounding the perennial streams and riparian corridors in the study area.

Coal Creek, two un-named tributaries to Coal Creek, Murphy Creek, and an un-named tributary to Murphy Creek (as identified by Colorado Department of Public Health and Environment stream segmentation source information) are all found in the study area and occur in the study area flowing from southeast to northwest into Sand Creek within the study area. Sand Creek subsequently flows northwest toward a confluence with the South Platte River approximately 12.3 miles to the northwest.

The study area lies within an un-named sub-watershed of the Sand Creek watershed, part of the South Platte River Basin. This watershed is the 6th level Hydrologic Unit Code 101900030402 of the U.S. Geological Survey National Hydrology Dataset. Aurora Reservoir is found to the southeast of the study area by approximately 8 miles.

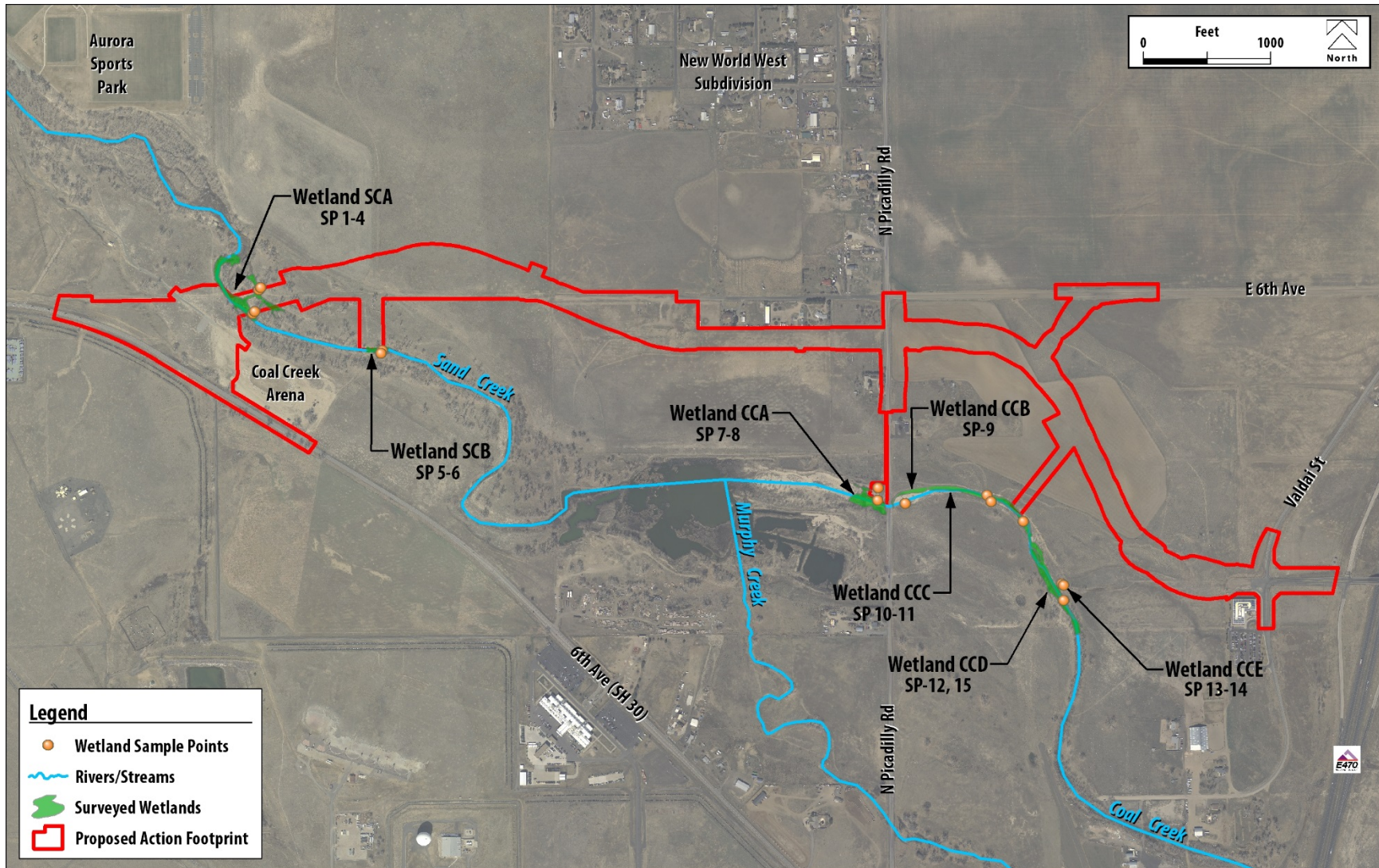
4. WETLAND DELINEATION SUMMARY

Wetlands and other WUS delineated in March 2015 and July 2015 were surveyed within the Proposed Action footprint and in areas adjacent to the Proposed Action footprint in an effort to cover additional areas if roadway drainage design modifications are required (**Figure 4**). Wetlands consisted of different species of vegetation, including plains cottonwood, sandbar willow, narrowleaf cattail (*Typha angustifolia*), rushes and sedges. Vegetation was dense due to the amount of precipitation in the region during the 2015 season and snowmelt from the previous winter. Fifteen (15) Wetland Determination Forms were completed for the project and all wetlands are labeled on **Figure 4**. The total wetland area delineated as part of the field survey in March 2015 and July 2015 is 3.73 acres (**Table 1**).

Table 1 Wetlands Summary

Wetland ID	Existing Area (acres)	Remarks
Wetland SCA	1.381	Large wetland associated with the Sand Creek floodplain/riparian corridor. Dominated by sandbar willow, common threesquare (<i>Schoenoplectus pungens</i>), scouring rush (<i>Equisetum laevigatum</i>) and jointleaf rush (<i>Juncus articulatus</i>).
Wetland SCB	0.065	Narrow wetland corridor associated with the Sand Creek floodplain/riparian corridor. Dominated by Russian olive, common threesquare, sandbar willow, and plains cottonwood.
Wetland CCA	0.689	Large wetland associated with the Coal Creek floodplain/riparian corridor (west side of Picadilly Road). Dominated by sandbar willow.
Wetland CCB	0.105	Moderate wetland associated with the Coal Creek floodplain/riparian corridor (east side of Picadilly Road). Dominated by sandbar willow and common threesquare.
Wetland CCC	0.172	Fringe wetland approximately 3 to 4 feet wide associated with the Coal Creek floodplain/riparian corridor (east side of Picadilly Road). Dominated by narrowleaf cattail and annual rabbitsfoot grass (<i>Polypogon monspeliensis</i> (L.) Desf.).
Wetland CCD	1.298	Moderate wetland associated with the Coal Creek floodplain/riparian corridor (east side of Picadilly Road). Dominated by sandbar willow and plains cottonwood.
Wetland CCE	0.018	Abundant, rich wetland associated with the Coal Creek floodplain/riparian corridor (east side of Picadilly Road). Dominated by narrowleaf cattail, sandbar willow, and plains cottonwood.
TOTAL	3.73 acres	

Figure 4 Surveied Wetlands Master Index Map



4.1 Wetland SCA

FHU staff identified and delineated Wetland SCA (Sand Creek A) in March 2015 where the Proposed Action crosses through a portion of the Sand Creek riparian zone (**Figure 5**). An additional survey was conducted based on new design elements, specifically regarding drainage. This new survey extended wetland SCA further north. Wetland conditions included flowing water, oxbows and ponded open water bordered by sand bars and vegetation of varying size. FHU staff analyzed four (4) sample points and compiled wetland determination forms for Wetland SCB. These wetland determination forms describe sample points SP-1 through SP-4 (**Appendix B**). SP-1 and SP-3 showed distinct wetland characteristics (see discussion below); SP-2 and SP-4 contained upland conditions, including non-hydric soils and a lack of hydrologic features. The strong contrast in sampling points helped define boundaries between wetland and upland areas.

Wetland SCA: Vegetation

The shrub and herb stratus dominate the vegetation in Wetland SCA. The sapling and shrub stratum of SP-1 consists of sandbar willows (50 percent); common threesquare (80 percent), narrowleaf cattail (15 percent) and smooth brome (5 percent) make up the herb aerial coverage. The upland vegetation, SP-2, surrounding the wetlands consists of smooth brome, plains cottonwood, yellow sweetclover (*Melilotus officinalis*), American licorice (*Glycyrrhiza lepidota*), Canadian horseweed (*Conyza canadensis*), and other grasses. The sapling and shrub stratum in SP-3 is made up of sandbar willows (20 percent). The herb stratum contains mostly jointleaf rush (55 percent), with scouringrush horsetail (*Equisetum hyemale*) (20 percent), switch grass (*Panicum virgatum*) (10 percent), smooth brome (5 percent), squirreltail (*Elymus elymoides*) (5 percent), and reed canarygrass (*Phalaris arundinacea*) (5 percent). The upland vegetation, SP-4, surrounding the wetlands had similar plants species to SP-2. SP-1 and SP-3 passed the Dominance Test and Prevalence Index; therefore, the area contains a predominance of hydrophytic vegetation.

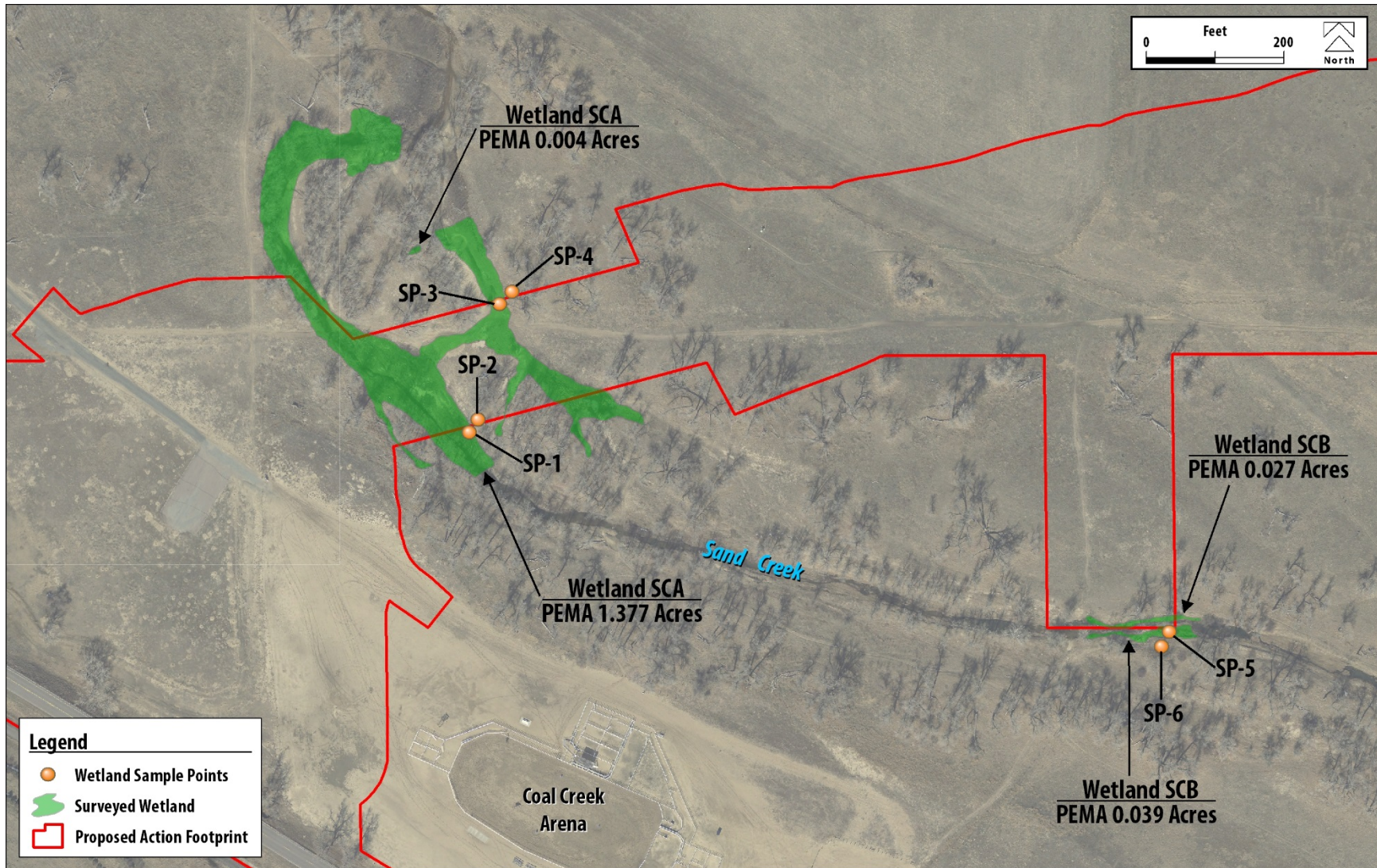
Wetland SCA: Soils

FHU staff downloaded a Web Soil Survey which shows these areas having a “Sandy alluvial land” soil type (NRCS, accessed 2015). During the field survey, FHU staff dug soil pits to investigate the soil profile. In SP-1, the first 10 inches of the soil profile consisted of saturated sand with a soil color of 10YR 4/3 (100 percent). From 10 to 20 inches, the profile was made up of saturated loamy sand, with a soil color of Gley 1 3/10Y (100 percent). This soil condition qualifies as a *Loamy Gleyed Matrix*.

In SP-3, the first 6 inches of the soil surface consisted of saturated loamy sand with two prominent colors in the matrix: 7.5YR 3/1 (55 percent) and 7.5YR 3/3 (25 percent). Redox features of 7.5YR 5/6 made up the remaining 20 percent. From 6 to 10 inches, the soil profile had a sand texture (saturated), with 100 percent of the soil color consisting of 10YR 3/2. From 10 to 20 inches, the soil profile was loamy sand (saturated) and contained a soil color of 10YR 2/2 (100 percent). This soil contained redox concentrations which qualifies the soil as hydric.

According to US Army Corps of Engineers (USACE) guidelines, both sample point soil conditions qualify as hydric (refer to data forms in **Appendix B**).

Figure 5 Surveied Wetlands Map – Sand Creek A & B



Wetland SCA: Hydrology

Primary hydrologic indicators for SP-1 and SP-3 include saturation (beginning within the first inch). SP-1 secondary indicators include drainage patterns and the FAC-Neutral Test. SP-3 was similar with the secondary indicators of the drainage patterns, geomorphic position, and the FAC-Neutral Test. Therefore, wetland hydrology is present at Wetland SCA.

Wetland SCA is classified as a *palustrine emergent, temporarily flooded wetland* (PEMA) under the Cowardin classification system (Cowardin et al., 1979). The total size of Wetland SCA is **1.381 acre**.

4.2 *Wetland SCB*

FHU staff identified and delineated Wetland SCB (Sand Creek B) where the Proposed Action Alternative touches the north portion of the Sand Creek riparian zone (**Figure 5**). Wetland conditions included flowing water bordered by sand bars in the southwest area and vegetation of varying size to the north, south, and southeast. FHU staff analyzed two (2) sample points and compiled wetland determination forms for Wetland SCC. These wetland determination forms describe sample points SP-5 and SP-6 (**Appendix B**). SP-5 showed distinct wetland characteristics (see discussion below); SP-6 contained upland conditions, including non-hydric soils. The strong contrast in sampling points helped define boundaries between wetland and upland areas.

Wetland SCC: Vegetation

Groups of trees and herbs dominate the vegetation in Wetland SCB. The tree stratum in SP-5 is made up of Russian olive (40 percent) and plains cottonwood (20 percent). The sapling and shrub stratum contains sandbar willows (15 percent) and Russian olive (5 percent). The herb stratum contains mostly common threesquare (55 percent), smooth brome (10 percent), leafy spurge (*Euphorbia esula*) (10 percent), common spikerush (*Eleocharis palustris*) (5 percent) and woolly sedge (*Carex pellita*) (5 percent) accounting for the rest of the herb aerial coverage. SP-5 passed the Dominance Test and Prevalence Index; therefore, the area contains a predominance of hydrophytic vegetation. The upland vegetation, SP-6, surrounding the wetlands consists of smooth brome, common saltgrass (*Distichlis spicata*), alfalfa (*Medicago sativa*), leafy spurge, and other grasses.

Wetland SCC: Soils

FHU staff downloaded a Web Soil Survey which shows this area having a “Sandy alluvial land” soil type (NRCS, accessed 2015). During the field survey, FHU staff dug soil pits to investigate the soil profile. In SP-5, the first 4 inches of the soil surface consisted of saturated sand with a prominent color in the matrix of 10YR 4/3 (100 percent). From 4 to 12 inches, the soil profile had a sand texture (saturated), with 85 percent of the soil color consisting of 10YR 4/3 and 15 percent of the soil color consisting of Gley 13/N. From 12 to 20 inches, the soil profile was sand (saturated) and contained a soil color of 10YR 4/3 (100 percent). This soil qualified as *Sandy Gley Matrix* dominated by sand.

According to USACE guidelines, SP-5 soil conditions qualify as hydric (refer to data forms in **Appendix B**).

Wetland SCC: Hydrology

Primary hydrologic indicators for SP-5 include surface water (7 inches deep), high water table (at 12 inches), saturation (at least 18 inches deep), sediment deposits, drift deposits, and aquatic invertebrates; secondary indicators include drainage patterns, geomorphic position and passing the FAC-Neutral Test.

Wetland SCC is classified as a *palustrine emergent, temporarily flooded wetland* (PEMA) under the Cowardin classification system (Cowardin et al., 1979). The total size of Wetland SCC is **0.065 acre**.

4.3 Wetland CCA

FHU staff identified and delineated Wetland CCA (Coal Creek A), found along the west edge of Picadilly Road where Coal Creek crosses the roadway perpendicularly via culverts (**Figure 6**). Wetland conditions included flowing water with several sand bars and locations of sparse vegetation of varying sizes. Coal Creek west of Picadilly Road consisted of a wide, shallow, braided floodplain with sandbars scattered throughout and where the OHWM extends to the edges of the channel braids. However, the low-flow channel itself changes from year to year within the overall OHWM.

FHU staff analyzed two sample points and compiled wetland determination forms for Wetland CCA. These wetland determination forms describe sample points SP-7 and SP-8 (**Appendix B**). SP-7 showed distinct wetland characteristics (see discussion below); SP-8 contained upland conditions, including upland plant species, non-hydric soils and a lack of hydrologic features.

Wetland CCA: Vegetation

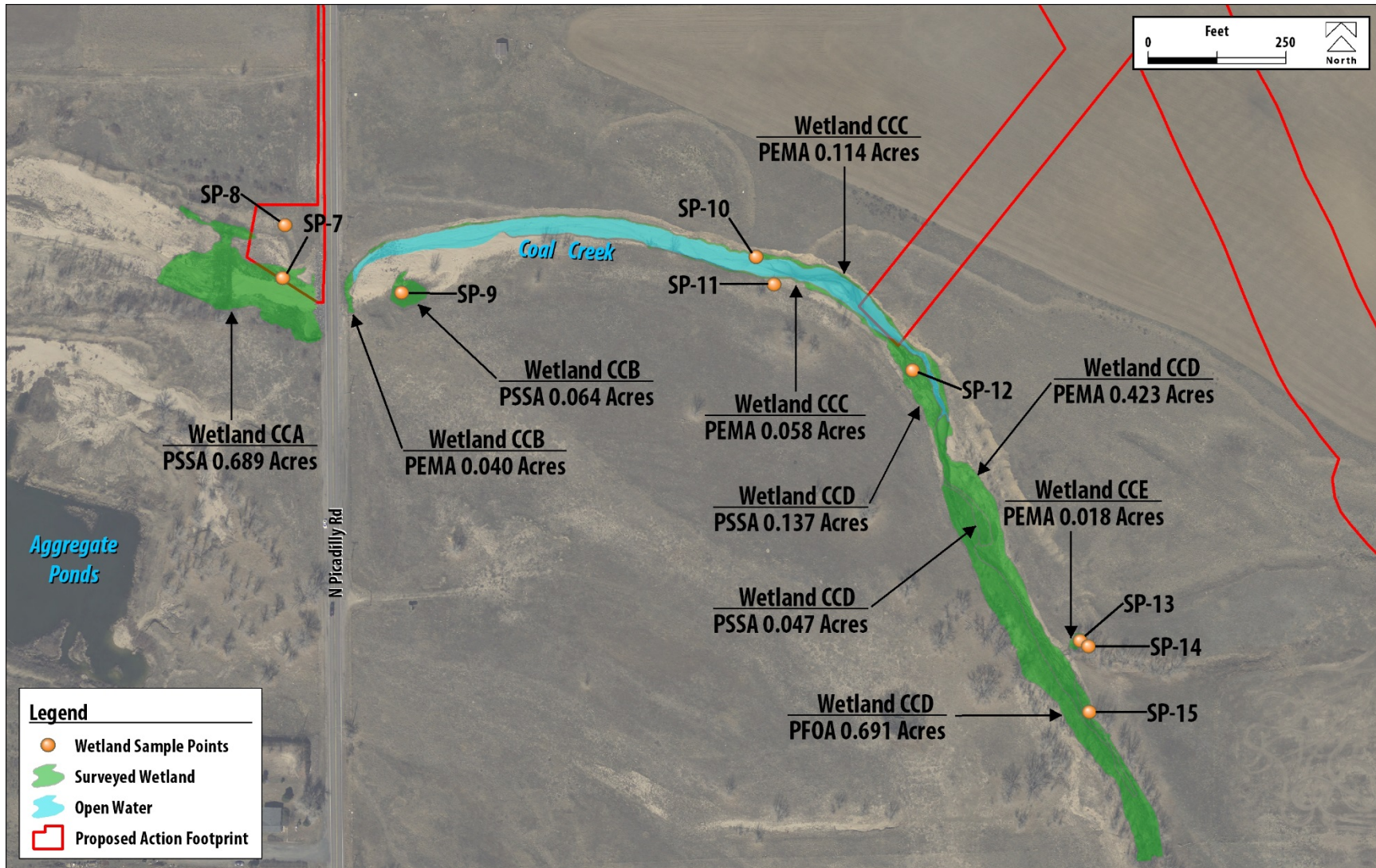
Groups of shrubs dominate the vegetation in Wetland CCA. The sapling and shrub stratum in SP-7 is made up mostly of sandbar willows (75 percent). The herb stratum contains squirreltail (5 percent) and jointleaf rush (5 percent). SP-7 passed the Dominance Test and Prevalence Index; therefore, the area contains a predominance of hydrophytic vegetation. The upland vegetation surrounding the wetlands consists of sand dropseed (*Sporobolus cryptandrus*), kochia (*Bassia scoparia*), annual ragweed (*Ambrosia artemisiifolia*), common sunflower (*Helianthus annuus*), common mullein (*Verbascum thapsus*), and other grasses.

Wetland CCA: Soils

FHU staff downloaded a Web Soil Survey which shows this area having a “Sandy alluvial land” soil type (NRCS, accessed 2015). During the field survey, FHU staff dug soil pits to investigate the soil profile. In SP-7, the first 10 inches of the soil surface consisted of saturated sandy loam with two prominent colors in the matrix: 10YR 4/3 (50 percent) and 10YR 5/3 (45 percent). Redox features of 7.5YR 5/6 made up the remaining 5 percent. From 10 to 16 inches, the soil profile remained as saturated sandy loam. Three soil colors were present: 10YR 4/3 (45 percent), 10YR 5/3 (45 percent) and Gley 1 3/10B (10 percent). From 16 to 20 inches, the soil profile contained a soil color of 10YR 4/3 (100 percent). This portion of the profile was also a sandy loam. This soil qualified as *Redox Depressions*.

According to USACE guidelines, SP-7 soil conditions qualify as hydric (refer to data forms in **Appendix B**).

Figure 6 Surveyed Wetlands Map – Coal Creek A, B, C, D, E



Wetland CCA: Hydrology

Primary hydrologic indicators for SP-7 include surface water (4 inches deep), high water table (at 4 inches), saturation (20+ inches), water marks, sediment deposits, drift deposits and inundation visible on aerial imagery. Secondary indicators include sparsely vegetated concave surface, drainage patterns, geomorphic position and passing the FAC-Neutral Test.

Wetland CCA is classified as palustrine scrub-shrub wetland which is temporarily flooded (PSSA) under the Cowardin classification system (Cowardin et al., 1979). The total size of Wetland CCA is **0.689 acre**.

4.4 *Wetland CCB*

FHU staff identified and delineated Wetland CCB (Coal Creek B), found along the east edge of Picadilly Road where Coal Creek crosses the roadway perpendicularly via culverts (**Figure 6**). Wetland conditions included flowing water with several sand bars and sparse vegetation of varying size. Coal Creek east of Picadilly Road consisted of a wide, shallow, floodplain with sandbars scattered throughout and where the OHWM extends to the edges of the channel and the sandbars. Outside of the OHWM, a steep rise in topography constrains the channel. The south bank of Coal Creek has been eroded to a 3-to 4-foot incised bank, while the north bank of Coal Creek is eroded in areas to heights of 6-to-10 feet in height. Within the overall OHWM the low-flow channel has the opportunity to change its alignment.

FHU staff analyzed two sample points and compiled two (2) wetland determination forms for Wetland CCB. These wetland determination forms describe sample points SP-9 and SP-11 (**Appendix B**). SP-9 showed distinct wetland characteristics (see discussion below). SP-11 contained upland conditions, including upland plant species, non-hydric soils and a lack of hydrologic features. SP-11 was also used as an upland outpost for Wetlands CCC, CCD, and CCE.

Wetland CCB: Vegetation

The shrub stratum dominates vegetation in Wetland CCB. The sapling/shrub stratum present at the wetland is exclusively the sandbar willow (45 percent). The herb stratum in this wetland is comprised of common threesquare (15 percent) and jointleaf rush (5 percent). A great deal of sand/bare soil (35 percent) was exposed in the wetland area. SP-9 vegetation passed the Dominance Test and the Prevalence Index, confirming hydrophytic vegetation is located in the wetland area. The upland vegetation, described in SP-11, was dominated by smooth brome with a small amount of sandbar willow.

Wetland CCB: Soils

FHU staff downloaded a Web Soil Survey which shows this area having a "Sandy alluvial land" soil type (NRCS, accessed 2015). During the field survey, FHU staff dug soil pits to investigate the soil profile. In SP-9, the first 12 inches of the soil surface consisted of two prominent colors in the matrix: 10YR 4/3 (40 percent) with a sandy loam and 10YR 5/3 (55 percent) with a loamy sand texture. The first 12 inches also had a presence of redox concentrations in the matrix with a color of 7.5YR 5/6 (5 percent). Depths 12 to 16 inches were observed with a similar soil mix containing the same two prominent colors: 10YR 4/3 (45 percent) and 10YR 5/3 (45 percent); depths 12 to 16 inches also contained small concentrations observed with a color of Gley 1 3/10B (10 percent). Depths 16 to 20 inches were composed of a single color: 10YR 4/3 (100 percent). Depths 12 to 20 were noted as a sandy loam texture and saturated.

According to USACE guidelines, SP-9 soil conditions qualify as hydric (refer to data forms in **Appendix B**).

Wetland CCB: Hydrology

Primary hydrologic indicators of surface water, high water table, saturation, water marks, sediment deposits, drift deposits, and inundation visible on aerial imagery were identified at Wetland CCB. Secondary indicators of sparsely vegetated concave surface, drainage patterns, and geomorphic position were also observed.

Wetland CCB is classified as a PSSA wetland under the Cowardin classification system (Cowardin et al., 1979). The total size of Wetland CCB is **0.105 acre**.

4.5 *Wetland CCC*

FHU staff identified and delineated Wetland CCC (Coal Creek C), found east of Picadilly Road where Coal Creek begins to curve southeast (**Figure 6**). Wetland conditions included flowing water with several sand bars and locations of sparse vegetation of varying sizes. Coal Creek east of Picadilly Road consisted of a wide, shallow, floodplain with sandbars scattered throughout and where the OHWM extends to the edges of the channel and the sandbars. Outside of the OHWM, a steep rise in topography constrains the channel. The south bank of Coal Creek has been eroded to a 3-to 4-foot incised bank, while the north bank of Coal Creek is eroded in areas to heights of 6-to-10 feet in height. Within the overall OHWM the low-flow channel has the opportunity to change its alignment.

FHU staff analyzed two sample points and compiled wetland determination forms for Wetland CCC. This wetland determination form describes sample point SP-10 (**Appendix B**). SP-10 showed distinct wetland characteristics (see discussion below); SP-11 contained upland conditions, including upland plant species, non-hydric soils and a lack of hydrologic features.

Wetland CCC: Vegetation

Herbaceous species dominate the vegetation in Wetland CCC. The herb stratum contains narrowleaf cattail (40 percent), rabbitsfoot grass (30 percent), woolly sedge (5 percent), smartweed (*Polygonum spp.*) (2 percent), and softstem bulrush (2 percent). SP-10 passed the Dominance Test and Prevalence Index; therefore, the area contains a predominance of hydrophytic vegetation. The upland vegetation, SP-11, surrounding the wetlands consists of plains cottonwood, smooth brome, leafy spurge, yellow salsify (*Tragopogon dubius*), and other grasses.

Wetland CCC: Soils

FHU staff downloaded a Web Soil Survey which shows this area having a “Sandy alluvial land” soil type (NRCS, accessed 2015). During the field survey, FHU staff dug soil pits to investigate the soil profile. In SP-10, the first 4 inches of the soil surface consisted of saturated sand with a prominent color in the matrix of 10YR 3/2 (100 percent). From 4 to 8 inches, the soil profile remained as saturated sandy loam with two prominent colors in the matrix: Gley 1 3/N (20 percent) and 10YR 3/2 (80 percent). This soil qualified as a *Sandy Gleyed Matrix*, which contains young sandy soil and sandy gleyed soils.

According to USACE guidelines, SP-10 soil conditions qualify as hydric (refer to data forms in **Appendix B**).

Wetland CCC: Hydrology

Primary hydrologic indicators for SP-10 include saturation (at least 20 inches deep), sediment deposits, and drift deposits. Secondary indicators include drainage patterns, geomorphic position, and passing the FAC-Neutral Test.

Wetland CCC is classified as a PEMA wetland under the Cowardin classification system (Cowardin et al., 1979). The total size of Wetland CCC is **0.172 acre**.

4.6 Wetland CCD

FHU staff identified and delineated Wetland CCD (Coal Creek D), found east of Picadilly Road where Coal Creek begins to curve southeast (**Figure 6**). Wetland conditions included flowing water with abundant vegetation of varying sizes at the east end blending into less abundant vegetation to the west end of Coal Creek. Coal Creek at Wetland CCD consisted of a narrower channel cross-section than wetlands further to the west. The channel at this location contained a narrower OHWM with sandbars and a narrower and deeper low-flow channel. The topography was more gradual outside of the OHWM.

FHU staff analyzed three sample points and compiled wetland determination forms for Wetland CCD. These wetland determination forms describe sample points SP-12 and SP-15 (**Appendix B**). SP-12 and 15 showed distinct wetland characteristics (see discussion below); SP-11 was used as the outpoint for wetlands CCC, CCD, and CCE.

Wetland CCD: Vegetation

Shrubs and trees dominate the vegetation in Wetland CCD. The sapling and shrub stratum of SP-12 also consists of sandbar willows (75 percent); woolly sedge (15 percent), yellow sweetclover (10 percent) and common sunflower (2 percent) make up the remaining herb aerial coverage.

The tree stratum in SP-15 is made up of plains cottonwoods (50 percent) and peachleaf willows (*Salix amygdaloides*) (15 percent). The sapling and shrub stratum consists of sandbar willows (50 percent); narrowleaf cattails (20 percent) make up the remaining herb aerial coverage. SP-12 and SP-15 passed the Dominance Test and Prevalence Index; therefore, the area contains a predominance of hydrophytic vegetation.

Wetland CCD: Soils

FHU staff downloaded a Web Soil Survey which shows these areas having a “Sandy alluvial land” soil type (NRCS, accessed 2015). During the field survey, FHU staff dug soil pits to investigate the soil profile. In SP-12, the first 20 inches of the soil surface consisted of saturated sand with a prominent color in the matrix of 10YR 3/2 (100 percent). This soil is considered a saturated sandy soil and assumed hydric for the soils are too young to show hydric indicators.

In SP-15, the first 3 inches of the soil surface consisted of dry sandy silt loam with a prominent color in the matrix of 10YR 3/2 (100 percent). From 3 to 14 inches, the soil profile became a saturated sand with a matrix color of 10YR 3/2 at 100 percent. From 14 to 18 inches, the soil profile contained two soil colors: 10YR 3/2 (85 percent) and Gley 1 3/N (15 percent). This portion of the profile was also saturated sand. This soil qualified as *Sandy Gleyed Matrix*.

According to USACE guidelines, both sample points soil conditions qualify as hydric (refer to data forms in **Appendix B**).

Wetland CCD: Hydrology

Primary hydrologic indicators for SP-12 include surface water (Coal Creek), high water table (at 10 inches), saturation (20 inches or greater), water marks, sediment deposits, and drift deposits. Secondary indicators include drainage patterns, geomorphic position and passing the FAC-Neutral Test.

Primary hydrologic indicators for SP-15 include surface water (3 inches deep), high water table (at 3 inches), saturation (3 inches or greater), water marks, sediment deposits, drift deposits and water-stained leaves. Secondary indicators include drainage patterns, geomorphic position and passing the FAC-Neutral Test.

Wetland CCD is classified as a PSSA wetland under the Cowardin classification system (Cowardin et al., 1979). The total size of Wetland CCD is **1.298 acre**.

4.7 *Wetland CCE*

FHU staff identified and delineated Wetland CCE (Coal Creek E), found along the east side of Picadilly Road where Coal Creek curves towards the southeast (**Figure 6**). Wetland conditions included flowing water with dense vegetation. Coal Creek at Wetland CCE consisted of a narrower channel cross-section than wetlands further to the west and contained more dense vegetation and vegetation growing in the channel itself (cattails and bulrush). The channel at this location contained a few braids, but otherwise contained one main low-flow channel where it appeared little movement due to lack of distinct and bare sandbars. The topography was more gradual outside of the OHWM.

FHU staff analyzed two sample points and compiled wetland determination forms for Wetland CCE. These wetland determination forms describe sample points SP-13 and SP-14 (**Appendix B**). SP-13 showed distinct wetland characteristics (see discussion below). SP-14 consisted of upland vegetation and lacked hydric soils and wetland hydrology.

Wetland CCE: Vegetation

The herb stratum dominates the vegetation in Wetland CCE. The tree stratum in SP-13 is made up of plains cottonwoods (20 percent) and the sapling/shrub stratum contains sandbar willows (20 percent). The herb stratum is comprised of narrowleaf cattails (60 percent) and duckweed (*Lemna spp.*) (5 percent). SP-13 passed the Dominance Test and Prevalence Index; therefore, the area contains a predominance of hydrophytic vegetation. The upland vegetation surrounding the wetlands consists of smooth brome, leafy spurge, and yellow salsify.

Wetland CCE: Soils

FHU staff downloaded a Web Soil Survey which shows this area having a “Sandy alluvial land” soil type (NRCS, accessed 2015). During the field survey, FHU staff dug soil pits to investigate the soil profile. In SP-13, a soil survey was not conducted due to the lack of access caused by standing water in the area. The soils at SP-13 are assumed to be hydric based on the prevalence of hydrophytic plant species and the presence of hydrologic wetland indicators.

According to USACE guidelines, SP-13 soil conditions qualify as hydric (refer to data forms in **Appendix B**).

Wetland CCE: Hydrology

The primary hydrologic indicator for SP-13 is surface water (12 inches deep); a secondary indicator is geomorphic position.

Wetland CCE is classified as a PEMA wetland under the Cowardin classification system (Cowardin et al., 1979). The total size of Wetland CCE is **0.018 acre**.

4.8 Waters of the US and Jurisdictional Status

Murphy Creek, Coal Creek, and Sand Creek would be considered WUS within the Clean Water Act (CWA) jurisdiction (as defined by 33 Code of Federal Regulations Part 328). The specific WUS indicators include relatively permanent waters (RPWs) that flow directly or indirectly into a Traditional Navigable Water (TNW) and wetlands directly abutting RPWs that flow directly or indirectly into TNW (USACE, 2007); Sand Creek and Coal Creek were both identified as RPWs and the South Platte River was identified as a known TNW. Wetlands identified during the March 2015 and July 2015 delineation were found directly abutting these RPWs and are therefore likely jurisdictional as well.

4.9 Impacts and Mitigation to Jurisdictional Wetlands

Once the preliminary design of the Proposed Action has been prepared, FHU staff will analyze total quantities of wetland temporary and permanent impacts. Depending on the extent of wetland impacts, this project will likely require several Section 404 Nationwide Permit for construction at Sand Creek and Coal Creek. The project team will coordinate with the USACE to identify mitigation strategies related to wetland impacts. These strategies may include on-site mitigation, off-site mitigation, purchase of wetland bank credits, or use of a separate strategy approved by the USACE.

Construction of impervious surfaces would increase runoff exposing the surrounding vegetation to higher levels of pollutants. Increased runoff may lead to increased soil erosion.

5. CONCLUSIONS

This technical report summarizes FHU's delineation of wetlands in support of the City of Aurora's 6th Avenue Parkway Extension Environmental Assessment. 3.73 acres of wetlands were delineated within the study area that either intersect or are adjacent to the Proposed Action. Should the proposed project be subject to design alteration, additional wetland delineation efforts may be required. The construction of the Proposed Action will require permitting under Section 404 of the CWA. Any Section 404 permit(s) will be acquired from the USACE prior to construction activities occurring.

6. REFERENCES

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Appendix A Site Photographs



Photo 1: Looking north along Sand Creek at northern portion of Wetland SCA



Photo 2: Outpoint for northern portion of Wetland SCA.
Looking east directly adjacent to Sand Creek



Photo 3: Looking west along Sand Creek at southern portion of Wetland SCA



Photo 4: Outpoint for southern portion of Wetland SCA.
Looking east directly adjacent to Sand Creek



Photo 5: Looking southeast along Sand Creek at stream bank wetlands associated with the creek. Wetland SCB is located in the background.



Photo 6: Looking west along Coal Creek adjacent to the Picadilly Road culvert (Wetland CCA)



Photo 7: Outpoint for Wetland CCA. Looking north directly adjacent to Coal Creek



Photo 8: Looking east along Coal Creek adjacent to the Picadilly Road culvert (Wetland CCB)



Photo 9: Looking east along Coal Creek at the fringe wetland abutting the creek on the north side and vertical eroded banks of Coal Creek (Wetland CCC).



Photo 10: Looking west along Coal Creek at the fringe wetland on the south bank of the Ordinary High Water Mark (Wetland CCC).



Photo 11: Looking southeast along Coal Creek at a sandbar dominated by Sandbar Willow (Wetland CCD).



Photo 12: Another view of the sandbar dominated areas of Wetland CCD, looking north along Coal Creek.



Photo 13: View looking south into Wetland CCD, where the PSSA wetland changes to a PFOA wetland type.



Photo 14: View looking southeast into Wetland CCE, where cattails and willows dominate a small pothole with standing water.

*Note: Additional photographs can be provided on request.

Appendix B

Wetland Determination Forms

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: 6th Avenue Parkway Extension City/County: Aurora/Arapahoe Sampling Date: 3/16/2015
 Applicant/Owner: City of Aurora State: CO Sampling Point: SP-1
 Investigator(s): Keith Hidalgo, Jake Lloyd, Anthony Marshall Section, Township, Range: SEC 011 - T4S - 66W
 Landform (hillslope, terrace, etc.): side slope of channel Local relief (concave, convex, none): none Slope (%): 0-2
 Subregion (LRR): LRR G Lat: 39.72532716 Long: -104.7526266 Datum: NAD 83
 Soil Map Unit Name: Sandy alluvial land NWI classification: PEMAC

Are climatic/hydrologic conditions on the site typical for this time of the year? Y (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "normal circumstances" present? Yes
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? <u>Y</u>	Is the Sampled Area Within a Wetland? <u>Y</u>
Hydric Soil Present? <u>Y</u>	
Indicators of Wetland Hydrology Present? <u>Y</u>	
If yes, optional wetland site ID: <u>SCA (Sand Creek A)</u>	

Remarks: (Explain alternative procedures here or in a separate report.)
 Wetland area located along south side of potential impact area for bridge location. Old oxbow within greater cottonwood gallery.

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Dominance Test Worksheet	
1 _____	_____	_____	_____	Number of Dominant Species that are OBL, FACW, or FAC: <u>2</u> (A)	
2 _____	_____	_____	_____	Total Number of Dominant Species Across all Strata: <u>2</u> (B)	
3 _____	_____	_____	_____	Percent of Dominant Species that are OBL, FACW, or FAC: <u>100.00%</u> (A/B)	
4 _____	_____	_____	_____		
5 _____	_____	_____	_____		
<u>0</u> = Total Cover					
Sapling/Shrub Stratum (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Prevalence Index Worksheet	
1 <u>Salix interior</u>	<u>50</u>	<u>Y</u>	<u>FACW</u>	Total % Cover of: Multiply by:	
2 _____	_____	_____	_____	OBL species	<u>95</u> x 1 = <u>95</u>
3 _____	_____	_____	_____	FACW species	<u>50</u> x 2 = <u>100</u>
4 _____	_____	_____	_____	FAC species	<u>0</u> x 3 = <u>0</u>
5 _____	_____	_____	_____	FACU species	<u>0</u> x 4 = <u>0</u>
<u>50</u> = Total Cover				UPL species	<u>5</u> x 5 = <u>25</u>
				Column totals	<u>150</u> (A) <u>220</u> (B)
				Prevalence Index = B/A = <u>1.47</u>	
Herb Stratum (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Hydrophytic Vegetation Indicators:	
1 <u>Schoenoplectus pungens</u>	<u>80</u>	<u>Y</u>	<u>OBL</u>	<u> </u> 1 - Rapid Test for Hydrophytic Vegetation	
2 <u>Typha angustifolia</u>	<u>15</u>	<u>N</u>	<u>OBL</u>	<u>X</u> 2 - Dominance Test is >50%	
3 <u>Bromus inermis</u>	<u>5</u>	<u>N</u>	<u>UPL</u>	<u>X</u> 3 - Prevalence Index is ≤3.0 ¹	
4 _____	_____	_____	_____	4 - Morphological Adaptations ¹ (provide supporting data in Remarks or on a separate sheet)	
5 _____	_____	_____	_____	Problematic Hydrophytic Vegetation ¹ (Explain)	
6 _____	_____	_____	_____		
7 _____	_____	_____	_____		
8 _____	_____	_____	_____		
9 _____	_____	_____	_____		
10 _____	_____	_____	_____		
<u>100</u> = Total Cover					
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status		
1 _____	_____	_____	_____		
2 _____	_____	_____	_____		
<u>0</u> = Total Cover					
%/Bare Ground in Herb Stratum _____				Hydrophytic Vegetation Present? <u>Y</u>	

Remarks: (Include photo numbers here or on a separate sheet)
 Area along Sand Creek dominated by common three-square bulrush. Patches of sandbar willow throughout Sand Creek floodplain

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-10	10YR 4/3	100					Sand	Saturated
10-20	Gley 1 3/10Y	100					Loamy sand	Saturated

¹Type: C = Concentration, D = Depletion, RM = Reduced Matrix, CS = Covered or Coated Sand Grains. ²Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) (LRR F) <input type="checkbox"/> 1 cm Muck (A9) (LRR F, G, H) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	<input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input checked="" type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> High Plains Depressions (F16) (MLRA 72 & 73 of LRR H)

- 1 cm Muck (A9) (LRR I, J)
 - Coast Prairie Redox (A16) (LRR F, G, H)
 - Dark Surface (S7) (LRR G)
 - High Plains Depressions (F16) (LRR H outside of MLRA 72 & 73)
 - Reduced Vertic (F18)
 - Red Parent Material (TF2)
 - Very Shallow Dark Surface (TF12)
 - Other (Explain in Remarks)
- ³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? <u>Y</u>
Remarks: <p style="text-align: center;">Dark Gley color in matrix; saturated near surface.</p>	

HYDROLOGY

Wetland Hydrology Indicators:	Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Salt Crust (B11) <input type="checkbox"/> Aquatic Invertebrates (B13) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input checked="" type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input checked="" type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)

Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>1</u> (includes capillary fringe)	Indicators of Wetland Hydrology Present? <u>Y</u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
 Slight rise in elevation along Sand Creek channel. Saturation present near soil surface.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: 6th Avenue Parkway Extension City/County: Aurora/Arapahoe Sampling Date: 3/16/2015
 Applicant/Owner: City of Aurora State: CO Sampling Point: SP-2
 Investigator(s): Keith Hidalgo, Jake Lloyd, Anthony Marshall Section, Township, Range: SEC 011 - T4S - 66W
 Landform (hillslope, terrace, etc.): side slope Local relief (concave, convex, none): none Slope (%): 0-5
 Subregion (LRR): LRR G Lat: 39.72537709 Long: -104.7525811 Datum: NAD 83
 Soil Map Unit Name: Sandy alluvial land NWI classification: _____

Are climatic/hydrologic conditions on the site typical for this time of the year? Y (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "normal circumstances" present? Yes
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? <u>Y</u>	Is the Sampled Area Within a Wetland? <u>N</u> If yes, optional wetland site ID: <u>Wetland SCA Outpoint</u>
Hydric Soil Present? <u>N</u>	
Indicators of Wetland Hydrology Present? <u>N</u>	

Remarks: (Explain alternative procedures here or in a separate report.)
 Sample point located adjacent to channel bank on slight upslope. Upland outpoint for SP-1.

VEGETATION -- Use scientific names of plants.

				Dominance Test Worksheet	
Tree Stratum (Plot size: _____)				Number of Dominant Species that are OBL, FACW, or FAC: <u>2</u> (A)	
1	<u>Populus deltoides</u>	Absolute % Cover: <u>40</u>	Dominant Species: <u>Y</u>	Indicator Status: <u>FAC</u>	Total Number of Dominant Species Across all Strata: <u>3</u> (B)
2	_____	_____	_____	_____	Percent of Dominant Species that are OBL, FACW, or FAC: <u>66.67%</u> (A/B)
3	_____	_____	_____	_____	
4	_____	_____	_____	_____	
5	_____	_____	_____	_____	
		<u>40</u> = Total Cover			
Sapling/Shrub Stratum (Plot size: _____)				Prevalence Index Worksheet	
1	<u>Salix interior</u>	Absolute % Cover: <u>5</u>	Dominant Species: <u>Y</u>	Indicator Status: <u>FACW</u>	Total % Cover of: Multiply by:
2	_____	_____	_____	_____	OBL species <u>0</u> x 1 = <u>0</u>
3	_____	_____	_____	_____	FACW species <u>5</u> x 2 = <u>10</u>
4	_____	_____	_____	_____	FAC species <u>40</u> x 3 = <u>120</u>
5	_____	_____	_____	_____	FACU species <u>25</u> x 4 = <u>100</u>
		<u>5</u> = Total Cover	UPL species <u>75</u> x 5 = <u>375</u>		
Herb Stratum (Plot size: _____)				Column totals <u>145</u> (A) <u>605</u> (B)	
1	<u>Bromus inermis</u>	Absolute % Cover: <u>75</u>	Dominant Species: <u>Y</u>	Indicator Status: <u>UPL</u>	Prevalence Index = B/A = <u>4.17</u>
2	<u>Melilotus officinalis</u>	<u>15</u>	<u>N</u>	<u>FACU</u>	Hydrophytic Vegetation Indicators: _____ 1 - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% _____ 3 - Prevalence Index is ≤3.0 ¹ _____ 4 - Morphological Adaptations ¹ (provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic
3	<u>Glycyrrhiza lepidota</u>	<u>5</u>	<u>N</u>	<u>FACU</u>	
4	<u>Conyza canadensis</u>	<u>5</u>	<u>N</u>	<u>FACU</u>	
5	_____	_____	_____	_____	
6	_____	_____	_____	_____	
7	_____	_____	_____	_____	
8	_____	_____	_____	_____	
9	_____	_____	_____	_____	
10	_____	_____	_____	_____	
		<u>100</u> = Total Cover			
Woody Vine Stratum (Plot size: _____)				Hydrophytic Vegetation Present? <u>Y</u>	
1	_____	_____	_____	_____	
2	_____	_____	_____	_____	
		<u>0</u> = Total Cover			
% /Bare Ground in Herb Stratum _____					

Remarks: (Include photo numbers here or on a separate sheet)
 Disturbed areas within vicinity of sample point appear to be filled in with yellow sweet clover.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	10YR 3/3	80					Sand	Dry
	10YR 3/1	20					Sand	Dry
2-20	10YR 4/3	100					Sand	Dry

¹Type: C = Concentration, D = Depletion, RM = Reduced Matrix, CS = Covered or Coated Sand Grains. ²Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> 1 cm Muck (A9) (LRR I, J)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Dark Surface (S7) (LRR G)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> High Plains Depressions (F16)
<input type="checkbox"/> Stratified Layers (A5) (LRR F)	<input type="checkbox"/> (LRR H outside of MLRA 72 & 73)
<input type="checkbox"/> 1 cm Muck (A9) (LRR F, G, H)	<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? <u> N </u>
Remarks: Dry, sandy area; no hydric soil indicators present.	

HYDROLOGY

Wetland Hydrology Indicators:	
Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres on Living
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Roots (C3) (where tilled)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)
<input type="checkbox"/> Salt Crust (B11)	
<input type="checkbox"/> Aquatic Invertebrates (B13)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Oxidized Rhizospheres on Living	
<input type="checkbox"/> Roots (C3) (where not tilled)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations: Surface Water Present? Yes _____ No <u> X </u> Depth (inches): _____ Water Table Present? Yes _____ No <u> X </u> Depth (inches): _____ Saturation Present? Yes _____ No <u> X </u> Depth (inches): _____ (includes capillary fringe)	Indicators of Wetland Hydrology Present? <u> N </u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Slight rise in elevation above Sand Creek channel.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: 6th Avenue Parkway Extension City/County: Aurora/Arapahoe Sampling Date: 3/16/2015
 Applicant/Owner: City of Aurora State: CO Sampling Point: SP-3
 Investigator(s): Keith Hidalgo, Jake Lloyd, Anthony Marshall Section, Township, Range: SEC 002 - T4S - 66W
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0-1
 Subregion (LRR): LRR G Lat: 39.7258375 Long: -104.7524632 Datum: NAD 83
 Soil Map Unit Name: Sandy alluvial land NWI classification: PEMA

Are climatic/hydrologic conditions on the site typical for this time of the year? Y (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "normal circumstances" present? Yes
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? <u>Y</u>	Is the Sampled Area Within a Wetland? <u>Y</u>
Hydric Soil Present? <u>Y</u>	
Indicators of Wetland Hydrology Present? <u>Y</u>	
If yes, optional wetland site ID: <u>SCA (Sand Creek A)</u>	

Remarks: (Explain alternative procedures here or in a separate report.)
 Wetland area located along north side of potential impact area for bridge location. Old oxbow within greater cottonwood gallery.

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Dominance Test Worksheet	
1 _____	_____	_____	_____	Number of Dominant Species that are OBL, FACW, or FAC: <u>3</u> (A)	
2 _____	_____	_____	_____	Total Number of Dominant Species Across all Strata: <u>3</u> (B)	
3 _____	_____	_____	_____	Percent of Dominant Species that are OBL, FACW, or FAC: <u>100.00%</u> (A/B)	
4 _____	_____	_____	_____		
5 _____	_____	_____	_____		
	<u>0</u>	= Total Cover			
Sapling/Shrub Stratum (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Prevalence Index Worksheet	
1 <u>Salix interior</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>	Total % Cover of: Multiply by:	
2 _____	_____	_____	_____	OBL species	<u>55</u> x 1 = <u>55</u>
3 _____	_____	_____	_____	FACW species	<u>25</u> x 2 = <u>50</u>
4 _____	_____	_____	_____	FAC species	<u>30</u> x 3 = <u>90</u>
5 _____	_____	_____	_____	FACU species	<u>0</u> x 4 = <u>0</u>
	<u>20</u>	= Total Cover		UPL species	<u>10</u> x 5 = <u>50</u>
				Column totals	<u>120</u> (A) <u>245</u> (B)
				Prevalence Index = B/A =	<u>2.04</u>
Herb Stratum (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Hydrophytic Vegetation Indicators:	
1 <u>Juncus articulatus</u>	<u>55</u>	<u>Y</u>	<u>OBL</u>	<u>1</u> - Rapid Test for Hydrophytic Vegetation	
2 <u>Equisetum laevigatum</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	<u>X</u> 2 - Dominance Test is >50%	
3 <u>Panicum virgatum</u>	<u>10</u>	<u>N</u>	<u>FAC</u>	<u>X</u> 3 - Prevalence Index is ≤3.0 ¹	
4 <u>Bromus inermis</u>	<u>5</u>	<u>N</u>	<u>UPL</u>	4 - Morphological Adaptations ¹ (provide supporting data in Remarks or on a separate sheet)	
5 <u>Elymus elymoides</u>	<u>5</u>	<u>N</u>	<u>UPL</u>	Problematic Hydrophytic Vegetation ¹ (Explain)	
6 <u>Phalaris arundinacea</u>	<u>5</u>	<u>N</u>	<u>FACW</u>		
7 _____	_____	_____	_____		
8 _____	_____	_____	_____		
9 _____	_____	_____	_____		
10 _____	_____	_____	_____		
	<u>100</u>	= Total Cover			
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Hydrophytic Vegetation Present? <u>Y</u>	
1 _____	_____	_____	_____		
2 _____	_____	_____	_____		
	<u>0</u>	= Total Cover			
% /Bare Ground in Herb Stratum _____					

Remarks: (Include photo numbers here or on a separate sheet)
 Low sandbar area along abandoned oxbow.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-6	7.5YR 3/1	55	7.5YR 5/6	20	C	M	Loamy Sand	Saturated
	7.5YR 3/3	25					Loamy Sand	Saturated
6-10	10YR 3/2	100					Sand	Saturated
10-20	10YR 2/2	100					Loamy Sand	Saturated

¹Type: C = Concentration, D = Depletion, RM = Reduced Matrix, CS = Covered or Coated Sand Grains. ²Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> 1 cm Muck (A9) (LRR I, J)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Dark Surface (S7) (LRR G)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> High Plains Depressions (F16)
<input type="checkbox"/> Stratified Layers (A5) (LRR F)	<input type="checkbox"/> (LRR H outside of MLRA 72 & 73)
<input type="checkbox"/> 1 cm Muck (A9) (LRR F, G, H)	<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? <u>Y</u>
Remarks: <p style="text-align: center;">Sandy alluvium within abandoned oxbow.</p>	

HYDROLOGY

Wetland Hydrology Indicators:	
Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres on Living
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Roots (C3) (where tilled)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)
<input type="checkbox"/> Salt Crust (B11)	
<input type="checkbox"/> Aquatic Invertebrates (B13)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Oxidized Rhizospheres on Living	
<input type="checkbox"/> Roots (C3) (where not tilled)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>1</u> (includes capillary fringe)	Indicators of Wetland Hydrology Present? <u>Y</u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
 Surface water present in nearby abandoned oxbow; saturation begins close to the soil surface.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: 6th Avenue Parkway Extension City/County: Aurora/Arapahoe Sampling Date: 3/16/2015
 Applicant/Owner: City of Aurora State: CO Sampling Point: SP-4
 Investigator(s): Keith Hidalgo, Jake Lloyd, Anthony Marshall Section, Township, Range: SEC 002 - T4S - 66W
 Landform (hillslope, terrace, etc.): side slope Local relief (concave, convex, none): concave Slope (%): 0-5
 Subregion (LRR): LRR G Lat: 39.725887 Long: -104.752401 Datum: NAD 83
 Soil Map Unit Name: Sandy alluvial land NWI classification: _____

Are climatic/hydrologic conditions on the site typical for this time of the year? Y (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "normal circumstances" present? Yes
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? <u>Y</u>	Is the Sampled Area Within a Wetland? <u>N</u>
Hydric Soil Present? <u>N</u>	
Indicators of Wetland Hydrology Present? <u>N</u>	
If yes, optional wetland site ID: _____	

Remarks: (Explain alternative procedures here or in a separate report.)
 Sample point located adjacent to channel bank. Upland outpost for SP-3.

VEGETATION -- Use scientific names of plants.

				Dominance Test Worksheet	
<u>Tree Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status		
1 <u>Populus deltoides</u>	40	Y	FAC	Number of Dominant Species that are OBL, FACW, or FAC: <u>2</u> (A)	
2 _____	_____	_____	_____	Total Number of Dominant Species Across all Strata: <u>3</u> (B)	
3 _____	_____	_____	_____	Percent of Dominant Species that are OBL, FACW, or FAC: <u>66.67%</u> (A/B)	
4 _____	_____	_____	_____		
5 _____	_____	_____	_____		
	40	= Total Cover			
<u>Sapling/Shrub Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Prevalence Index Worksheet	
1 <u>Salix interior</u>	5	Y	FACW	Total % Cover of: Multiply by:	
2 _____	_____	_____	_____	OBL species	0 x 1 = 0
3 _____	_____	_____	_____	FACW species	5 x 2 = 10
4 _____	_____	_____	_____	FAC species	40 x 3 = 120
5 _____	_____	_____	_____	FACU species	25 x 4 = 100
	5	= Total Cover		UPL species	75 x 5 = 375
				Column totals	<u>145</u> (A) <u>605</u> (B)
				Prevalence Index = B/A =	<u>4.17</u>
<u>Herb Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Hydrophytic Vegetation Indicators:	
1 <u>Bromus inermis</u>	75	Y	UPL	1 - Rapid Test for Hydrophytic Vegetation	
2 <u>Melilotus officinalis</u>	15	N	FACU	<u>X</u> 2 - Dominance Test is >50%	
3 <u>Glycyrrhiza lepidota</u>	5	N	FACU	3 - Prevalence Index is ≤3.0 ¹	
4 <u>Conyza canadensis</u>	5	N	FACU	4 - Morphological Adaptations ¹ (provide supporting data in Remarks or on a separate sheet)	
5 _____	_____	_____	_____	Problematic Hydrophytic Vegetation ¹ (Explain)	
6 _____	_____	_____	_____		
7 _____	_____	_____	_____		
8 _____	_____	_____	_____		
9 _____	_____	_____	_____		
10 _____	_____	_____	_____		
	100	= Total Cover			
<u>Woody Vine Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status		
1 _____	_____	_____	_____		
2 _____	_____	_____	_____		
	0	= Total Cover			
% /Bare Ground in Herb Stratum _____				Hydrophytic Vegetation Present? <u>Y</u>	

Remarks: (Include photo numbers here or on a separate sheet)
 Area dominated by smooth brome within cottonwood gallery; few sandbar willow sprigs found throughout.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	10YR 3/2	100					Sand	Dry
2-20	10YR 3/2	30					Loamy Sand	Dry
	10YR 4/3	70					Loamy Sand	Dry

¹Type: C = Concentration, D = Depletion, RM = Reduced Matrix, CS = Covered or Coated Sand Grains. ²Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> 1 cm Muck (A9) (LRR I, J)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Dark Surface (S7) (LRR G)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> High Plains Depressions (F16)
<input type="checkbox"/> Stratified Layers (A5) (LRR F)	<input type="checkbox"/> (LRR H outside of MLRA 72 & 73)
<input type="checkbox"/> 1 cm Muck (A9) (LRR F, G, H)	<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? <u> N </u>
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Remarks: Dry sandy area adjacent to Wetland SCA

HYDROLOGY

Wetland Hydrology Indicators:	
Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres on Living
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Roots (C3) (where tilled)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)
<input type="checkbox"/> Salt Crust (B11)	
<input type="checkbox"/> Aquatic Invertebrates (B13)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Oxidized Rhizospheres on Living	
<input type="checkbox"/> Roots (C3) (where not tilled)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations: Surface Water Present? Yes _____ No <u> X </u> Depth (inches): _____ Water Table Present? Yes _____ No <u> X </u> Depth (inches): _____ Saturation Present? Yes _____ No <u> X </u> Depth (inches): _____ (includes capillary fringe)	Indicators of Wetland Hydrology Present? <u> N </u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Slightly higher area above Wetland SCA; moderate slope

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: 6th Avenue Parkway Extension City/County: Aurora Sampling Date: 7/16/15
 Applicant/Owner: Aurora State: CO Sampling Point: SP-5
 Investigator(s): Keith Hidalgo and Marissa Finney Section, Township, Range: Section 11 - T4S - R66W
 Landform (hillslope, terrace, etc.): Stream bank Local relief (concave, convex, none): concave Slope (%): 0 - 3
 Subregion (LRR): LRR G Lat: 39.724507 Long: -104.749015 Datum: NAD 83
 Soil Map Unit Name: Blakeland Loamy Sand, 1 to 20 percent slopes NWI classification: PEMA/C

Are climatic/hydrologic conditions on the site typical for this time of the year? Y (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "normal circumstances" present? _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? <u>Y</u>	Is the Sampled Area Within a Wetland? <u>Y</u>
Hydric Soil Present? <u>Y</u>	
Indicators of Wetland Hydrology Present? <u>Y</u>	
If yes, optional wetland site ID: <u>Wetland SCB</u>	

Remarks:
 Stream bank abutting Sand Creek dominated by common three square and sandbar willow.

VEGETATION -- Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: _____)				Dominance Test Worksheet	
	Absolute % Cover	Dominant Species	Indicator Status		
1 <u><i>Elaeagnus angustifolia</i></u>	40	Y	FACU	Number of Dominant Species that are OBL, FACW, or FAC: <u>3</u> (A)	
2 <u><i>Populus deltoides</i></u>	20	Y	FAC	Total Number of Dominant Species Across all Strata: <u>5</u> (B)	
3 _____				Percent of Dominant Species that are OBL, FACW, or FAC: <u>60.00%</u> (A/B)	
4 _____					
5 _____					
	60	= Total Cover			
<u>Sapling/Shrub Stratum</u> (Plot size: _____)				Prevalence Index Worksheet	
	Absolute % Cover	Dominant Species	Indicator Status		
1 <u><i>Salix interior</i></u>	15	Y	FACW	Total % Cover of: Multiply by:	
2 <u><i>Elaeagnus angustifolia</i></u>	5	Y	FACU	OBL species	<u>10</u> x 1 = <u>10</u>
3 _____				FACW species	<u>70</u> x 2 = <u>140</u>
4 _____				FAC species	<u>20</u> x 3 = <u>60</u>
5 _____				FACU species	<u>45</u> x 4 = <u>180</u>
				UPL species	<u>20</u> x 5 = <u>100</u>
	20	= Total Cover		Column totals	<u>165</u> (A) <u>490</u> (B)
				Prevalence Index = B/A =	<u>2.97</u>
<u>Herb Stratum</u> (Plot size: _____)				Hydrophytic Vegetation Indicators:	
	Absolute % Cover	Dominant Species	Indicator Status		
1 <u><i>Schoenoplectus pungens</i></u>	55	Y	FACW	<u>1</u> - Rapid Test for Hydrophytic Vegetation	
2 <u><i>Bromus inermis</i></u>	10	N	UPL	<u>X</u> 2 - Dominance Test is >50%	
3 <u><i>Euphorbia esula</i></u>	10	N	UPL	<u>X</u> 3 - Prevalence Index is ≤3.0 ¹	
4 <u><i>Eleocharis palustris</i></u>	5	N	OBL	4 - Morphological Adaptations ¹ (provide supporting data in Remarks or on a separate sheet)	
5 <u><i>Carex pellita</i></u>	5	N	OBL	Problematic Hydrophytic Vegetation ¹ (Explain)	
6 _____					
7 _____					
8 _____					
9 _____					
10 _____					
	85	= Total Cover		¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic	
<u>Woody Vine Stratum</u> (Plot size: _____)				Hydrophytic Vegetation Present? <u>Y</u>	
	Absolute % Cover	Dominant Species	Indicator Status		
1 _____					
2 _____					
	0	= Total Cover			
% Bare Ground in Herb Stratum _____					

Remarks:
 Wetland vegetation on low stream bank abutting channel.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 4	10YR4/3	100					sand	saturated
4 - 12	10YR4/3	85					sand	saturated
4 - 12	Gley13/N	15					sand	saturated
12 - 20	10YR4/3	100					sand	saturated

¹Type: C = Concentration, D = Depletion, RM = Reduced Matrix, CS = Covered or Coated Sand Grains. ²Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol (A1)	<input checked="" type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> 1 cm Muck (A9) (LRR I, J)			
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H)			
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Dark Surface (S7) (LRR G)			
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> High Plains Depressions (F16)			
<input type="checkbox"/> Stratified Layers (A5) (LRR F)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> (LRR H outside of MLRA 72 & 73)			
<input type="checkbox"/> 1 cm Muck (A9) (LRR F, G, H)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Reduced Vertic (F18)			
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Red Parent Material (TF2)			
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)			
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	<input checked="" type="checkbox"/> Other (Explain in Remarks)			
<input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)	<input type="checkbox"/> High Plains Depressions (F16) (MLRA 72 & 73 of LRR H)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.			
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)					

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? <u>Y</u>
Remarks: <p style="text-align: center;">Soils are dominated by sand and some of the sand are resist, young soil</p>	

HYDROLOGY

Wetland Hydrology Indicators:	
Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required)
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres on Living
<input checked="" type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Roots (C3) (where tilled)
<input checked="" type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)
<input type="checkbox"/> Salt Crust (B11)	
<input checked="" type="checkbox"/> Aquatic Invertebrates (B13)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Oxidized Rhizospheres on Living	
<input type="checkbox"/> Roots (C3) (where not tilled)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations (of the wetland area): Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>7</u> Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>12</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Indicators of Wetland Hydrology Present? <u>Y</u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Hydrology associated with the presence of Sand Creek.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: 6th Avenue Parkway Extension City/County: Aurora Sampling Date: 7/16/15
 Applicant/Owner: Aurora State: CO Sampling Point: SP-6
 Investigator(s): Keith Hidalgo and Marissa Finney Section, Township, Range: Section 11 - T4S - R66W
 Landform (hillslope, terrace, etc.): Terrace above channel Local relief (concave, convex, none): convex Slope (%): 5 - 10
 Subregion (LRR): LRR G Lat: 39.72449 Long: -104.749057 Datum: NAD 83
 Soil Map Unit Name: Sandy Alluvial Land NWI classification: _____

Are climatic/hydrologic conditions on the site typical for this time of the year? Y (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "normal circumstances" present? Yes
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? <u>N</u> Hydric Soil Present? <u>N</u> Indicators of Wetland Hydrology Present? <u>N</u>	Is the Sampled Area Within a Wetland? <u>N</u> If yes, optional wetland site ID: _____
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Remarks:

Outpoint above the wetland, sandy area with Brome.

VEGETATION -- Use scientific names of plants.

	Absolute % Cover	Dominant Species	Indicator Status	
Tree Stratum (Plot size: _____)				Dominance Test Worksheet
1 _____	_____	_____	_____	Number of Dominant Species that are OBL, FACW, or FAC: <u>1</u> (A)
2 _____	_____	_____	_____	Total Number of Dominant Species Across all Strata: <u>2</u> (B)
3 _____	_____	_____	_____	Percent of Dominant Species that are OBL, FACW, or FAC: <u>50.00%</u> (A/B)
4 _____	_____	_____	_____	
5 _____	_____	_____	_____	
0 = Total Cover				
Sapling/Shrub Stratum (Plot size: _____)				Prevalence Index Worksheet
1 _____	_____	_____	_____	Total % Cover of: Multiply by:
2 _____	_____	_____	_____	OBL species <u>0</u> x 1 = <u>0</u>
3 _____	_____	_____	_____	FACW species <u>20</u> x 2 = <u>40</u>
4 _____	_____	_____	_____	FAC species <u>0</u> x 3 = <u>0</u>
5 _____	_____	_____	_____	FACU species <u>0</u> x 4 = <u>0</u>
0 = Total Cover				UPL species <u>52</u> x 5 = <u>260</u>
				Column totals <u>72</u> (A) <u>300</u> (B)
Herb Stratum (Plot size: _____)				Prevalence Index = B/A = <u>4.17</u>
1 <u>Bromus inermis</u>	40	Y	UPL	
2 <u>Distichlis spicata</u>	20	Y	FACW	
3 <u>Medicago sativa</u>	10	N	UPL	
4 <u>Euphorbia esula</u>	2	N	UPL	
5 _____	_____	_____	_____	
6 _____	_____	_____	_____	
7 _____	_____	_____	_____	
8 _____	_____	_____	_____	
9 _____	_____	_____	_____	
10 _____	_____	_____	_____	
72 = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1 _____	_____	_____	_____	
2 _____	_____	_____	_____	
0 = Total Cover				
% Bare Ground in Herb Stratum _____				

Hydrophytic Vegetation Indicators:
 _____ 1 - Rapid Test for Hydrophytic Vegetation
 _____ 2 - Dominance Test is >50%
 _____ 3 - Prevalence Index is ≤3.0¹
 _____ 4 - Morphological Adaptations¹ (provide supporting data in Remarks or on a separate sheet)
 _____ Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present? N

Remarks:

Upland outpoint above wetland.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 4	10YR4/3	100					sandy silt	dry

¹Type: C = Concentration, D = Depletion, RM = Reduced Matrix, CS = Covered or Coated Sand Grains. ²Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) (LRR F) <input type="checkbox"/> 1 cm Muck (A9) (LRR F, G, H) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	<input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> High Plains Depressions (F16) (MLRA 72 & 73 of LRR H)

<input type="checkbox"/> 1 cm Muck (A9) (LRR I, J) <input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H) <input type="checkbox"/> Dark Surface (S7) (LRR G) <input type="checkbox"/> High Plains Depressions (F16) (LRR H outside of MLRA 72 & 73) <input type="checkbox"/> Reduced Vertic (F18) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)

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

Restrictive Layer (if observed): Type: <u>Compacted Sand</u> Depth (inches): <u>4"</u>	Hydric Soil Present? <u>N</u>
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Remarks:
 Soil compacted in 4 inches, which is dominated by sand.

HYDROLOGY

Wetland Hydrology Indicators:	Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Salt Crust (B11) <input type="checkbox"/> Aquatic Invertebrates (B13) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input checked="" type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)

Field Observations (of the wetland area): Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Indicators of Wetland Hydrology Present? <u>N</u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
 Dry sandy side-slope above wetland

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: 6th Avenue Parkway Extension City/County: Aurora/Arapahoe Sampling Date: 3/16/2015
 Applicant/Owner: City of Aurora State: CO Sampling Point: SP-7
 Investigator(s): Keith Hidalgo, Jake Lloyd, Anthony Marshall Section, Township, Range: SEC 11 - T4S - 66W
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0-1
 Subregion (LRR): LRR G Lat: 39.72119393 Long: -104.7352077 Datum: NAD 83
 Soil Map Unit Name: Sandy alluvial land NWI classification: PSSA

Are climatic/hydrologic conditions on the site typical for this time of the year? Y (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "normal circumstances" present? Yes
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? <u>Y</u>	Is the Sampled Area Within a Wetland? <u>Y</u>
Hydric Soil Present? <u>Y</u>	
Indicators of Wetland Hydrology Present? <u>Y</u>	
If yes, optional wetland site ID: <u>CCA (Coal Creek A)</u>	

Remarks: (Explain alternative procedures here or in a separate report.)
 Wetland area located on west side of Picadilly Road within braided Coal Creek, adjacent to flowing water.

VEGETATION -- Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Dominance Test Worksheet	
1 _____	_____	_____	_____	Number of Dominant Species that are OBL, FACW, or FAC: <u>2</u> (A)	
2 _____	_____	_____	_____	Total Number of Dominant Species Across all Strata: <u>3</u> (B)	
3 _____	_____	_____	_____	Percent of Dominant Species that are OBL, FACW, or FAC: <u>66.67%</u> (A/B)	
4 _____	_____	_____	_____		
5 _____	_____	_____	_____		
	<u>0</u>	= Total Cover			
<u>Sapling/Shrub Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Prevalence Index Worksheet	
1 <u>Salix interior</u>	<u>75</u>	<u>Y</u>	<u>FACW</u>	Total % Cover of: Multiply by:	
2 _____	_____	_____	_____	OBL species <u>5</u>	x 1 = <u>5</u>
3 _____	_____	_____	_____	FACW species <u>75</u>	x 2 = <u>150</u>
4 _____	_____	_____	_____	FAC species <u>0</u>	x 3 = <u>0</u>
5 _____	_____	_____	_____	FACU species <u>0</u>	x 4 = <u>0</u>
	<u>75</u>	= Total Cover		UPL species <u>5</u>	x 5 = <u>25</u>
				Column totals <u>85</u> (A)	<u>180</u> (B)
				Prevalence Index = B/A = <u>2.12</u>	
<u>Herb Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Hydrophytic Vegetation Indicators:	
1 <u>Elymus elymoides</u>	<u>5</u>	<u>Y</u>	<u>UPL</u>	<u>1</u> - Rapid Test for Hydrophytic Vegetation	
2 <u>Juncus articulatus</u>	<u>5</u>	<u>Y</u>	<u>OBL</u>	<u>X</u> 2 - Dominance Test is >50%	
3 _____	_____	_____	_____	<u>X</u> 3 - Prevalence Index is ≤3.0 ¹	
4 _____	_____	_____	_____	4 - Morphological Adaptations ¹ (provide supporting data in Remarks or on a separate sheet)	
5 _____	_____	_____	_____	Problematic Hydrophytic Vegetation ¹ (Explain)	
6 _____	_____	_____	_____		
7 _____	_____	_____	_____		
8 _____	_____	_____	_____		
9 _____	_____	_____	_____		
10 _____	_____	_____	_____		
	<u>10</u>	= Total Cover			
<u>Woody Vine Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status		
1 _____	_____	_____	_____		
2 _____	_____	_____	_____		
	<u>0</u>	= Total Cover			
% /Bare Ground in Herb Stratum <u>10</u>				Hydrophytic Vegetation Present? <u>Y</u>	

Remarks: (Include photo numbers here or on a separate sheet)
 Area contains pockets of sandbar willows with a large portion of exposed sandbars.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-10	10YR 4/3	50	7.5YR 5/6	5	C	M	Sandy loam	Saturated
	10YR 5/3	45					Sandy loam	Saturated
10-16	10YR 4/3	45					Sandy loam	Saturated
	10YR 5/3	45					Sandy loam	Saturated
	Gley 1 3/10B	10					Sandy loam	Saturated
16-20	10YR 4/3	100					Sandy loam	Saturated

¹Type: C = Concentration, D = Depletion, RM = Reduced Matrix, CS = Covered or Coated Sand Grains. ²Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)
<input type="checkbox"/> Stratified Layers (A5) (LRR F)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)
<input type="checkbox"/> 1 cm Muck (A9) (LRR F, G, H)	<input type="checkbox"/> Depleted Matrix (F3)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input checked="" type="checkbox"/> Redox Depressions (F8)
<input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)	<input type="checkbox"/> High Plains Depressions (F16)
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	<input type="checkbox"/> (MLRA 72 & 73 of LRR H)
	<input type="checkbox"/> 1 cm Muck (A9) (LRR I, J)
	<input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H)
	<input type="checkbox"/> Dark Surface (S7) (LRR G)
	<input type="checkbox"/> High Plains Depressions (F16) (LRR H outside of MLRA 72 & 73)
	<input type="checkbox"/> Reduced Vertic (F18)
	<input type="checkbox"/> Red Parent Material (TF2)
	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
	<input type="checkbox"/> Other (Explain in Remarks)

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

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? <u>Y</u>
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Remarks:
Entire soil profile consists of sandy loam texture (saturated). Redox features found within top layer; Gley components found within matrix starting at 10".

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
<u>Primary Indicators (minimum of one is required; check all that apply)</u>	
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres on Living
<input checked="" type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Roots (C3) (where tilled)
<input checked="" type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)
<input type="checkbox"/> Salt Crust (B11)	
<input type="checkbox"/> Aquatic Invertebrates (B13)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Oxidized Rhizospheres on Living	
<input type="checkbox"/> Roots (C3) (where not tilled)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:	
Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>4</u>	Indicators of Wetland Hydrology Present? <u>Y</u>
Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>4</u>	
Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	

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

Remarks:
Sample point adjacent to flowing water of Coal Creek. Several hydrologic indicators present.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: 6th Avenue Parkway Extension City/County: Aurora/Arapahoe Sampling Date: 3/16/2015
 Applicant/Owner: City of Aurora State: CO Sampling Point: SP-8
 Investigator(s): Keith Hidalgo, Jake Lloyd, Anthony Marshall Section, Township, Range: SEC 11 - T4S - 66W
 Landform (hillslope, terrace, etc.): side slope Local relief (concave, convex, none): none Slope (%): 0-5
 Subregion (LRR): LRR G Lat: 39.72145683 Long: -104.7351906 Datum: NAD 83
 Soil Map Unit Name: Sandy alluvial land NWI classification: _____

Are climatic/hydrologic conditions on the site typical for this time of the year? Y (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "normal circumstances" present? Yes
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? <u>N</u>	Is the Sampled Area Within a Wetland? <u>N</u>
Hydric Soil Present? <u>N</u>	
Indicators of Wetland Hydrology Present? <u>N</u>	
If yes, optional wetland site ID: _____	

Remarks: (Explain alternative procedures here or in a separate report.)
 Sample point located just upslope of braided Coal Creek channel. Upland outpoint for SP-7.

VEGETATION -- Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Dominance Test Worksheet	
1 _____	_____	_____	_____	Number of Dominant Species that are OBL, FACW, or FAC: <u>0</u> (A)	
2 _____	_____	_____	_____	Total Number of Dominant Species Across all Strata: <u>2</u> (B)	
3 _____	_____	_____	_____	Percent of Dominant Species that are OBL, FACW, or FAC: <u>0.00%</u> (A/B)	
4 _____	_____	_____	_____		
5 _____	_____	_____	_____		
	<u>0</u>	= Total Cover			
<u>Sapling/Shrub Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Prevalence Index Worksheet	
1 _____	_____	_____	_____	Total % Cover of: Multiply by:	
2 _____	_____	_____	_____	OBL species <u>0</u> x 1 = <u>0</u>	
3 _____	_____	_____	_____	FACW species <u>0</u> x 2 = <u>0</u>	
4 _____	_____	_____	_____	FAC species <u>0</u> x 3 = <u>0</u>	
5 _____	_____	_____	_____	FACU species <u>60</u> x 4 = <u>240</u>	
	_____	_____	_____	UPL species <u>5</u> x 5 = <u>25</u>	
	<u>0</u>	= Total Cover		Column totals <u>65</u> (A) <u>265</u> (B)	
				Prevalence Index = B/A = <u>4.08</u>	
<u>Herb Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Hydrophytic Vegetation Indicators:	
1 <u>Sporobolus cryptandrus</u>	<u>25</u>	<u>Y</u>	<u>FACU</u>	_____ 1 - Rapid Test for Hydrophytic Vegetation	
2 <u>Bassia scoparia</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	_____ 2 - Dominance Test is >50%	
3 <u>Ambrosia artemisiifolia</u>	<u>10</u>	<u>N</u>	<u>FACU</u>	_____ 3 - Prevalence Index is ≤3.0 ¹	
4 <u>Helianthus annuus</u>	<u>5</u>	<u>N</u>	<u>FACU</u>	_____ 4 - Morphological Adaptations ¹ (provide supporting data in Remarks or on a separate sheet)	
5 <u>Verbascum thapsus</u>	<u>5</u>	<u>N</u>	<u>UPL</u>	_____ Problematic Hydrophytic Vegetation ¹ (Explain)	
6 _____	_____	_____	_____	_____ ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic	
7 _____	_____	_____	_____		
8 _____	_____	_____	_____		
9 _____	_____	_____	_____		
10 _____	_____	_____	_____		
	<u>65</u>	= Total Cover			
<u>Woody Vine Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Hydrophytic Vegetation Present? <u>N</u>	
1 _____	_____	_____	_____		
2 _____	_____	_____	_____		
	<u>0</u>	= Total Cover			
% /Bare Ground in Herb Stratum <u>35</u>					

Remarks: (Include photo numbers here or on a separate sheet)
 Vegetation consists mostly of Sand Dropseed and Mexican Fireweed (Kochia).

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-20	10YR 4/3	100					Sand	Dry

¹Type: C = Concentration, D = Depletion, RM = Reduced Matrix, CS = Covered or Coated Sand Grains. ²Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) (LRR F) <input type="checkbox"/> 1 cm Muck (A9) (LRR F, G, H) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	<input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> High Plains Depressions (F16) (MLRA 72 & 73 of LRR H)

<input type="checkbox"/> 1 cm Muck (A9) (LRR I, J) <input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H) <input type="checkbox"/> Dark Surface (S7) (LRR G) <input type="checkbox"/> High Plains Depressions (F16) (LRR H outside of MLRA 72 & 73) <input type="checkbox"/> Reduced Vertic (F18) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)

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

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? <u> N </u>
Remarks: <p style="text-align: center;">Very dry, sandy soil profile expressing no hydric soil indicators.</p>	

HYDROLOGY

Wetland Hydrology Indicators:	
Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Salt Crust (B11) <input type="checkbox"/> Aquatic Invertebrates (B13) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)
	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)

Field Observations: Surface Water Present? Yes _____ No <u> X </u> Depth (inches): _____ Water Table Present? Yes _____ No <u> X </u> Depth (inches): _____ Saturation Present? Yes _____ No <u> X </u> Depth (inches): _____ (includes capillary fringe)	Indicators of Wetland Hydrology Present? <u> N </u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
 Outoint taken slightly upslope of Coal Creek channel and expressing no hydrologic features.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: 6th Avenue Parkway Extension City/County: Aurora/Arapahoe Sampling Date: 3/16/2015
 Applicant/Owner: City of Aurora State: CO Sampling Point: SP-9
 Investigator(s): Keith Hidalgo, Jake Lloyd, Anthony Marshall Section, Township, Range: SEC 11 - T4S - 66W
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0-4
 Subregion (LRR): LRR G Lat: 39.72119393 Long: -104.7352077 Datum: NAD 83
 Soil Map Unit Name: Sandy alluvial land NWI classification: PSSA

Are climatic/hydrologic conditions on the site typical for this time of the year? Y (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "normal circumstances" present? Yes
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? <u>Y</u>	Is the Sampled Area Within a Wetland? <u>Y</u>
Hydric Soil Present? <u>Y</u>	
Indicators of Wetland Hydrology Present? <u>Y</u>	
If yes, optional wetland site ID: <u>CCB (Coal Creek B)</u>	

Remarks: (Explain alternative procedures here or in a separate report.)
 Wetland area located on east side of Picadilly Road within braided Coal Creek, adjacent to flowing water. (SP-8 used as outpoint for Wetland CCB.)

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Dominance Test Worksheet	
1 _____	_____	_____	_____	Number of Dominant Species that are OBL, FACW, or FAC: <u>3</u> (A)	
2 _____	_____	_____	_____	Total Number of Dominant Species Across all Strata: <u>3</u> (B)	
3 _____	_____	_____	_____	Percent of Dominant Species that are OBL, FACW, or FAC: <u>100.00%</u> (A/B)	
4 _____	_____	_____	_____		
5 _____	_____	_____	_____		
	0 = Total Cover				
Sapling/Shrub Stratum (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Prevalence Index Worksheet	
1 <u>Salix interior</u>	45	Y	FACW	Total % Cover of: Multiply by:	
2 _____	_____	_____	_____	OBL species	20 x 1 = 20
3 _____	_____	_____	_____	FACW species	45 x 2 = 90
4 _____	_____	_____	_____	FAC species	0 x 3 = 0
5 _____	_____	_____	_____	FACU species	0 x 4 = 0
	45 = Total Cover			UPL species	0 x 5 = 0
				Column totals	65 (A) 110 (B)
				Prevalence Index = B/A = <u>1.69</u>	
Herb Stratum (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Hydrophytic Vegetation Indicators:	
1 <u>Schoenoplectus pungens</u>	15	Y	OBL	<u> </u> 1 - Rapid Test for Hydrophytic Vegetation	
2 <u>Juncus articulatus</u>	5	Y	OBL	<u>X</u> 2 - Dominance Test is >50%	
3 _____	_____	_____	_____	<u>X</u> 3 - Prevalence Index is ≤3.0 ¹	
4 _____	_____	_____	_____	4 - Morphological Adaptations ¹ (provide supporting data in Remarks or on a separate sheet)	
5 _____	_____	_____	_____	Problematic Hydrophytic Vegetation ¹ (Explain)	
6 _____	_____	_____	_____		
7 _____	_____	_____	_____		
8 _____	_____	_____	_____		
9 _____	_____	_____	_____		
10 _____	_____	_____	_____		
	20 = Total Cover				
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status		
1 _____	_____	_____	_____		
2 _____	_____	_____	_____		
	0 = Total Cover				
% /Bare Ground in Herb Stratum <u>35</u>				Hydrophytic Vegetation Present? <u>Y</u>	

Remarks: (Include photo numbers here or on a separate sheet)
 Area contains pockets of sandbar willows with a large portion of exposed sandbars.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-12	10YR 4/3	40	7.5YR 5/6	5	C	M	Sandy loam	Dry
	10YR 5/3	55					Sandy loam	Dry
12-16	10YR 4/3	45					Sandy loam	Saturated
	10YR 5/3	45					Sandy loam	Saturated
	Gley 1 3/10B	10					Sandy loam	Saturated
16-20	10YR 4/3	100					Sandy loam	Saturated

¹Type: C = Concentration, D = Depletion, RM = Reduced Matrix, CS = Covered or Coated Sand Grains. ²Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> 1 cm Muck (A9) (LRR I, J)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Dark Surface (S7) (LRR G)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> High Plains Depressions (F16)
<input type="checkbox"/> Stratified Layers (A5) (LRR F)	<input type="checkbox"/> (LRR H outside of MLRA 72 & 73)
<input type="checkbox"/> 1 cm Muck (A9) (LRR F, G, H)	<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? <u>Y</u>
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Remarks:
Entire soil profile consists of sandy loam texture and saturated beginning at 12 inches. Redox features present within top layer; Gley components found within matrix starting at 12".

HYDROLOGY

Wetland Hydrology Indicators:	Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required)
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Oxidized Rhizospheres on Living
<input checked="" type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living	<input type="checkbox"/> Roots (C3) (where tilled)
<input checked="" type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Roots (C3) (where not tilled)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)

Field Observations: Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>3</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>4</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>12+</u> (includes capillary fringe)	Indicators of Wetland Hydrology Present? <u>Y</u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Sample point adjacent to flowing water of Coal Creek. Several hydrologic indicators present.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: 6th Avenue Parkway Extension City/County: Aurora/Arapahoe Sampling Date: 3/17/2015
 Applicant/Owner: City of Aurora State: CO Sampling Point: SP-10
 Investigator(s): Keith Hidalgo, Jake Lloyd, Anthony Marshall Section, Township, Range: SEC 12 - T4S - 66W
 Landform (hillslope, terrace, etc.): side slope Local relief (concave, convex, none): none Slope (%): 0-4
 Subregion (LRR): LRR G Lat: 39.719326 Long: -104.730029 Datum: NAD 83
 Soil Map Unit Name: Sandy alluvial land NWI classification: _____

Are climatic/hydrologic conditions on the site typical for this time of the year? Y (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "normal circumstances" present? Yes
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? <u>N</u>	Is the Sampled Area Within a Wetland? <u>N</u>
Hydric Soil Present? <u>N</u>	
Indicators of Wetland Hydrology Present? <u>N</u>	
If yes, optional wetland site ID: _____	

Remarks: (Explain alternative procedures here or in a separate report.)
 Sample point located adjacent to depression on slight upslope. Outpoint to CCB.

VEGETATION -- Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Dominance Test Worksheet	
1 _____	_____	_____	_____	Number of Dominant Species that are OBL, FACW, or FAC: <u>1</u> (A)	
2 _____	_____	_____	_____	Total Number of Dominant Species Across all Strata: <u>2</u> (B)	
3 _____	_____	_____	_____	Percent of Dominant Species that are OBL, FACW, or FAC: <u>50.00%</u> (A/B)	
4 _____	_____	_____	_____		
5 _____	_____	_____	_____		
	<u>0</u>	= Total Cover			
<u>Sapling/Shrub Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Prevalence Index Worksheet	
1 <u>Salix interior</u>	<u>10</u>	<u>Y</u>	<u>FACW</u>	Total % Cover of: Multiply by:	
2 _____	_____	_____	_____	OBL species <u>0</u>	x 1 = <u>0</u>
3 _____	_____	_____	_____	FACW species <u>10</u>	x 2 = <u>20</u>
4 _____	_____	_____	_____	FAC species <u>0</u>	x 3 = <u>0</u>
5 _____	_____	_____	_____	FACU species <u>0</u>	x 4 = <u>0</u>
	<u>10</u>	= Total Cover		UPL species <u>50</u>	x 5 = <u>250</u>
				Column totals <u>60</u> (A)	<u>270</u> (B)
				Prevalence Index = B/A = <u>4.50</u>	
<u>Herb Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Hydrophytic Vegetation Indicators:	
1 <u>Bromus inermis</u>	<u>50</u>	<u>Y</u>	<u>UPL</u>	_____ 1 - Rapid Test for Hydrophytic Vegetation	
2 _____	_____	_____	_____	_____ 2 - Dominance Test is >50%	
3 _____	_____	_____	_____	_____ 3 - Prevalence Index is ≤3.0 ¹	
4 _____	_____	_____	_____	_____ 4 - Morphological Adaptations ¹ (provide supporting data in Remarks or on a separate sheet)	
5 _____	_____	_____	_____	_____ Problematic Hydrophytic Vegetation ¹ (Explain)	
6 _____	_____	_____	_____		
7 _____	_____	_____	_____		
8 _____	_____	_____	_____		
9 _____	_____	_____	_____		
10 _____	_____	_____	_____		
	<u>50</u>	= Total Cover			
<u>Woody Vine Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status		
1 _____	_____	_____	_____		
2 _____	_____	_____	_____		
	<u>0</u>	= Total Cover			
% /Bare Ground in Herb Stratum <u>4U</u>				Hydrophytic Vegetation Present? <u>N</u>	

Remarks: (Include photo numbers here or on a separate sheet)
 Sample point dominated by smooth brome with a few sandbar willows scattered throughout.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-8	10YR 4/3	40					Sand	Dry
	10YR 5/3	60					Loamy sand	Dry
8-20	10YR 4/3	100					Loamy sand	Dry

¹Type: C = Concentration, D = Depletion, RM = Reduced Matrix, CS = Covered or Coated Sand Grains. ²Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> 1 cm Muck (A9) (LRR I, J)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Dark Surface (S7) (LRR G)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> High Plains Depressions (F16)
<input type="checkbox"/> Stratified Layers (A5) (LRR F)	<input type="checkbox"/> (LRR H outside of MLRA 72 & 73)
<input type="checkbox"/> 1 cm Muck (A9) (LRR F, G, H)	<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? <u> N </u>
Remarks: <p style="text-align: center;">Dry sandy soil profile with no hydric soil indicators present.</p>	

HYDROLOGY

Wetland Hydrology Indicators:	
Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres on Living
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Roots (C3) (where tilled)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)
<input type="checkbox"/> Salt Crust (B11)	
<input type="checkbox"/> Aquatic Invertebrates (B13)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Oxidized Rhizospheres on Living	
<input type="checkbox"/> Roots (C3) (where not tilled)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations: Surface Water Present? Yes _____ No <u> X </u> Depth (inches): _____ Water Table Present? Yes _____ No <u> X </u> Depth (inches): _____ Saturation Present? Yes _____ No <u> X </u> Depth (inches): _____ (includes capillary fringe)	Indicators of Wetland Hydrology Present? <u> N </u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Sample point within greater lower area, however, no other hydrologic features present.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: 6th Avenue Extension Coal Creek City/County: Aurora Sampling Date: 7/16/15
 Applicant/Owner: Aurora State: CO Sampling Point: SP-11
 Investigator(s): Keith Hidalgo and Marissa Finney Section, Township, Range: Section 12 - T4S - R66W
 Landform (hillslope, terrace, etc.): streambank Local relief (concave, convex, none): concave Slope (%): 0 - 3
 Subregion (LRR): LRR G Lat: 39.72128 Long: -104.732152 Datum: NAD 83
 Soil Map Unit Name: Sandy Alluvial Land NWI classification: PEMA/C

Are climatic/hydrologic conditions on the site typical for this time of the year? Y (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "normal circumstances" present? Yes
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? <u>Y</u>	Is the Sampled Area Within a Wetland? <u>Y</u>
Hydric Soil Present? <u>Y</u>	
Indicators of Wetland Hydrology Present? <u>Y</u>	
If yes, optional wetland site ID: <u>Wetland CCC</u>	

Remarks:

PEMA/C wetland west part of Coal Creek. Fringe next to cut bank.

VEGETATION -- Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Dominance Test Worksheet	
1 _____	_____	_____	_____	Number of Dominant Species that are OBL, FACW, or FAC: <u>2</u> (A)	
2 _____	_____	_____	_____	Total Number of Dominant Species Across all Strata: <u>2</u> (B)	
3 _____	_____	_____	_____	Percent of Dominant Species that are OBL, FACW, or FAC: <u>100.00%</u> (A/B)	
4 _____	_____	_____	_____		
5 _____	_____	_____	_____		
<u>0</u> = Total Cover					
<u>Sapling/Shrub Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Prevalence Index Worksheet	
1 _____	_____	_____	_____	Total % Cover of: Multiply by:	
2 _____	_____	_____	_____	OBL species <u>7</u> x 1 = <u>7</u>	
3 _____	_____	_____	_____	FACW species <u>72</u> x 2 = <u>144</u>	
4 _____	_____	_____	_____	FAC species <u>0</u> x 3 = <u>0</u>	
5 _____	_____	_____	_____	FACU species <u>0</u> x 4 = <u>0</u>	
_____	_____	_____	_____	UPL species <u>0</u> x 5 = <u>0</u>	
_____	_____	_____	_____	Column totals <u>79</u> (A) <u>151</u> (B)	
<u>0</u> = Total Cover				Prevalence Index = B/A = <u>1.91</u>	
<u>Herb Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Hydrophytic Vegetation Indicators:	
1 <u>Typha angustifolia</u>	<u>40</u>	<u>Y</u>	<u>FACW</u>	<u>1</u> - Rapid Test for Hydrophytic Vegetation	
2 <u>Polypogon monspeliensis</u>	<u>30</u>	<u>Y</u>	<u>FACW</u>	<u>X</u> 2 - Dominance Test is >50%	
3 <u>Carex pellita</u>	<u>5</u>	<u>N</u>	<u>OBL</u>	<u>X</u> 3 - Prevalence Index is ≤3.0 ¹	
4 <u>Polygonum spp.</u>	<u>2</u>	<u>N</u>	<u>FACW</u>	4 - Morphological Adaptations ¹ (provide supporting data in Remarks or on a separate sheet)	
5 <u>Schoenoplectus tabernaemontani</u>	<u>2</u>	<u>N</u>	<u>OBL</u>	Problematic Hydrophytic Vegetation ¹ (Explain)	
6 _____	_____	_____	_____		
7 _____	_____	_____	_____		
8 _____	_____	_____	_____		
9 _____	_____	_____	_____		
10 _____	_____	_____	_____		
<u>79</u> = Total Cover				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic	
<u>Woody Vine Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Hydrophytic Vegetation Present? <u>Y</u>	
1 _____	_____	_____	_____		
2 _____	_____	_____	_____		
<u>0</u> = Total Cover					
% Bare Ground in Herb Stratum _____					

Remarks:

Sparse fringe of wetland next to steep cut banks.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 4	10YR3/2	100					sand	saturated
4 - 8	Gley13/N	20					sand	saturated
4 - 8	10YR3/2	80					sand	saturated

¹Type: C = Concentration, D = Depletion, RM = Reduced Matrix, CS = Covered or Coated Sand Grains. ²Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol (A1)	<input checked="" type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> 1 cm Muck (A9) (LRR I, J)			
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H)			
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Dark Surface (S7) (LRR G)			
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> High Plains Depressions (F16)			
<input type="checkbox"/> Stratified Layers (A5) (LRR F)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> (LRR H outside of MLRA 72 & 73)			
<input type="checkbox"/> 1 cm Muck (A9) (LRR F, G, H)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Reduced Vertic (F18)			
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Red Parent Material (TF2)			
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)			
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	<input checked="" type="checkbox"/> Other (Explain in Remarks)			
<input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)	<input type="checkbox"/> High Plains Depressions (F16) (MLRA 72 & 73 of LRR H)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.			
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)					

Restrictive Layer (if observed): Type: <u>Compacted soils</u> Depth (inches): <u>8"</u>	Hydric Soil Present? <u>Y</u>
Remarks: <p style="text-align: center;">Young sandy soils, possibly sandy gleyed soils.</p>	

HYDROLOGY

Wetland Hydrology Indicators:	
Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres on Living
<input checked="" type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Roots (C3) (where tilled)
<input checked="" type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)
<input type="checkbox"/> Salt Crust (B11)	
<input type="checkbox"/> Aquatic Invertebrates (B13)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Oxidized Rhizospheres on Living	
<input type="checkbox"/> Roots (C3) (where not tilled)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations (of the wetland area): Surface Water Present? Yes <u> </u> No <input checked="" type="checkbox"/> Depth (inches): <u> </u> Water Table Present? Yes <u> </u> No <input checked="" type="checkbox"/> Depth (inches): <u> </u> Saturation Present? Yes <input checked="" type="checkbox"/> No <u> </u> Depth (inches): <u>0</u> (includes capillary fringe)	Indicators of Wetland Hydrology Present? <u>Y</u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Abutting Coal Creek, which is a wide, shallow, braided channel at this location.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: 6th Avenue Extension Coal Creek City/County: Aurora Sampling Date: 7/16/15
 Applicant/Owner: Aurora State: CO Sampling Point: SP-12
 Investigator(s): Keith Hidalgo and Marissa Finney Section, Township, Range: Section 12 - T4S - R66W
 Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 3 - 5
 Subregion (LRR): LRR G Lat: 39.721142 Long: -104.732038 Datum: NAD 83
 Soil Map Unit Name: Sandy Alluvial Land NWI classification: _____

Are climatic/hydrologic conditions on the site typical for this time of the year? Y (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "normal circumstances" present? Yes
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? <u>N</u>	Is the Sampled Area Within a Wetland? <u>N</u>
Hydric Soil Present? <u>N</u>	
Indicators of Wetland Hydrology Present? <u>N</u>	
If yes, optional wetland site ID: _____	

Remarks:
 Outpoint used for Wetlands CCC, CCD, and CCE (outpoint to SP-11, SP-13, SP-14, and SP-15 due to similar upland characteristics).

VEGETATION -- Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Dominance Test Worksheet	
1 <u>Populus deltoides</u>	5	Y	FAC	Number of Dominant Species that are OBL, FACW, or FAC: <u>1</u> (A)	
2 _____	_____	_____	_____	Total Number of Dominant Species Across all Strata: <u>3</u> (B)	
3 _____	_____	_____	_____	Percent of Dominant Species that are OBL, FACW, or FAC: <u>33.33%</u> (A/B)	
4 _____	_____	_____	_____		
5 _____	_____	_____	_____		
	5 = Total Cover				
<u>Sapling/Shrub Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Prevalence Index Worksheet	
1 _____	_____	_____	_____	Total % Cover of: Multiply by:	
2 _____	_____	_____	_____	OBL species <u>0</u> x 1 = <u>0</u>	
3 _____	_____	_____	_____	FACW species <u>0</u> x 2 = <u>0</u>	
4 _____	_____	_____	_____	FAC species <u>5</u> x 3 = <u>15</u>	
5 _____	_____	_____	_____	FACU species <u>0</u> x 4 = <u>0</u>	
	0 = Total Cover			UPL species <u>60</u> x 5 = <u>300</u>	
				Column totals <u>65</u> (A) <u>315</u> (B)	
				Prevalence Index = B/A = <u>4.85</u>	
<u>Herb Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Hydrophytic Vegetation Indicators:	
1 <u>Bromus inermis</u>	40	Y	UPL	_____ 1 - Rapid Test for Hydrophytic Vegetation	
2 <u>Euphorbia esula</u>	15	Y	UPL	_____ 2 - Dominance Test is >50%	
3 <u>Tragopogon dubius</u>	5	N	UPL	_____ 3 - Prevalence Index is ≤3.0 ¹	
4 _____	_____	_____	_____	_____ 4 - Morphological Adaptations ¹ (provide supporting data in Remarks or on a separate sheet)	
5 _____	_____	_____	_____	_____ Problematic Hydrophytic Vegetation ¹ (Explain)	
6 _____	_____	_____	_____	_____ ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic	
7 _____	_____	_____	_____		
8 _____	_____	_____	_____		
9 _____	_____	_____	_____		
10 _____	_____	_____	_____		
	60 = Total Cover				
<u>Woody Vine Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Hydrophytic Vegetation Present? <u>N</u>	
1 _____	_____	_____	_____		
2 _____	_____	_____	_____		
	0 = Total Cover				
% Bare Ground in Herb Stratum _____					

Remarks:
 Upland Outpoint on terrace above the channel.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 6	10YR3/2	100					sand	moist

¹Type: C = Concentration, D = Depletion, RM = Reduced Matrix, CS = Covered or Coated Sand Grains. ²Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) (LRR F) <input type="checkbox"/> 1 cm Muck (A9) (LRR F, G, H) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	<input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> High Plains Depressions (F16) (MLRA 72 & 73 of LRR H)
	<input type="checkbox"/> 1 cm Muck (A9) (LRR I, J) <input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H) <input type="checkbox"/> Dark Surface (S7) (LRR G) <input type="checkbox"/> High Plains Depressions (F16) (LRR H outside of MLRA 72 & 73) <input type="checkbox"/> Reduced Vertic (F18) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)

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

Restrictive Layer (if observed): Type: <u>Compaction</u> Depth (inches): <u>6"</u>	Hydric Soil Present? <u>Y</u>
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Remarks:
 Upland Outpoint with dry, sandy soils.

HYDROLOGY

Wetland Hydrology Indicators:
Primary Indicators (minimum of one is required; check all that apply) <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9)
<input type="checkbox"/> Salt Crust (B11) <input type="checkbox"/> Aquatic Invertebrates (B13) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)
Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)

Field Observations (of the wetland area): Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Indicators of Wetland Hydrology Present? <u>N</u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
 No hydrologic indicators on terrace above wetland areas.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: 6th Avenue Parkway Extension City/County: Aurora Sampling Date: 7/16/15
 Applicant/Owner: Aurora State: CO Sampling Point: SP-13
 Investigator(s): Keith Hidalgo and Marissa Finney Section, Township, Range: Section 12 - T4S - R66W
 Landform (hillslope, terrace, etc.): sandbar Local relief (concave, convex, none): concave Slope (%): 0 - 5
 Subregion (LRR): LRR G Lat: 39.720709 Long: -104.731148 Datum: NAD 83
 Soil Map Unit Name: Sandy Alluvial Land NWI classification: PSSA

Are climatic/hydrologic conditions on the site typical for this time of the year? Y (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "normal circumstances" present? Yes
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? <u>Y</u> Hydric Soil Present? <u>Y</u> Indicators of Wetland Hydrology Present? <u>Y</u>	Is the Sampled Area Within a Wetland? <u>Y</u> If yes, optional wetland site ID: <u>Wetland CCD</u>
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Remarks:

Sandbar dominated by sandbar willow abutting Coal Creek.

VEGETATION -- Use scientific names of plants.

	Absolute % Cover	Dominant Species	Indicator Status	
Tree Stratum (Plot size: <u> </u>)				Dominance Test Worksheet
1 <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species that are OBL, FACW, or FAC: <u>2</u> (A)
2 <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant Species Across all Strata: <u>3</u> (B)
3 <u> </u>	<u> </u>	<u> </u>	<u> </u>	Percent of Dominant Species that are OBL, FACW, or FAC: <u>66.67%</u> (A/B)
4 <u> </u>	<u> </u>	<u> </u>	<u> </u>	
5 <u> </u>	<u> </u>	<u> </u>	<u> </u>	
	<u>0</u> = Total Cover			
Sapling/Shrub Stratum (Plot size: <u> </u>)				Prevalence Index Worksheet
1 <u>Salix interior</u>	75	Y	FACW	Total % Cover of: Multiply by:
2 <u> </u>	<u> </u>	<u> </u>	<u> </u>	OBL species <u>15</u> x 1 = <u>15</u>
3 <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACW species <u>75</u> x 2 = <u>150</u>
4 <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>0</u> x 3 = <u>0</u>
5 <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>12</u> x 4 = <u>48</u>
	<u>75</u> = Total Cover			UPL species <u>0</u> x 5 = <u>0</u>
Herb Stratum (Plot size: <u> </u>)				Column totals <u>102</u> (A) <u>213</u> (B)
1 <u>Carex pellita</u>	15	Y	OBL	Prevalence Index = B/A = <u>2.09</u>
2 <u>Melilotus officinalis</u>	10	Y	FACU	
3 <u>Helianthus annuus</u>	2	N	FACU	
4 <u> </u>	<u> </u>	<u> </u>	<u> </u>	
5 <u> </u>	<u> </u>	<u> </u>	<u> </u>	
6 <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7 <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8 <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9 <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10 <u> </u>	<u> </u>	<u> </u>	<u> </u>	
	<u>27</u> = Total Cover			
Woody Vine Stratum (Plot size: <u> </u>)				
1 <u> </u>	<u> </u>	<u> </u>	<u> </u>	
2 <u> </u>	<u> </u>	<u> </u>	<u> </u>	
	<u>0</u> = Total Cover			
% Bare Ground in Herb Stratum <u> </u>				

Hydrophytic Vegetation Indicators:
 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0¹
 4 - Morphological Adaptations¹ (provide supporting data in Remarks or on a separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Y

Remarks:

Sandbar Willow dominates sandbar.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 20	10YR3/2	100					sand	saturated

¹Type: C = Concentration, D = Depletion, RM = Reduced Matrix, CS = Covered or Coated Sand Grains. ²Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)
<input type="checkbox"/> Stratified Layers (A5) (LRR F)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)
<input type="checkbox"/> 1 cm Muck (A9) (LRR F, G, H)	<input type="checkbox"/> Depleted Matrix (F3)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)
<input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)	<input type="checkbox"/> High Plains Depressions (F16) (MLRA 72 & 73 of LRR H)
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	
	<input type="checkbox"/> 1 cm Muck (A9) (LRR I, J)
	<input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H)
	<input type="checkbox"/> Dark Surface (S7) (LRR G)
	<input type="checkbox"/> High Plains Depressions (F16) (LRR H outside of MLRA 72 & 73)
	<input type="checkbox"/> Reduced Vertic (F18)
	<input type="checkbox"/> Red Parent Material (TF2)
	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
	<input checked="" type="checkbox"/> Other (Explain in Remarks)

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

Restrictive Layer (if observed): Type: _____ Depth (inches): <u>20"</u>	Hydric Soil Present? <u>Y</u>
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Remarks:

Saturated sandy soils. Soils too young to show hydric indicators. Assumed hydric.

HYDROLOGY

Wetland Hydrology Indicators:	Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required)
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Oxidized Rhizospheres on Living
<input checked="" type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living	<input type="checkbox"/> Roots (C3) (where tilled)
<input checked="" type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Roots (C3) (where not tilled)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)

Field Observations (of the wetland area): Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>8</u> Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>10</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Indicators of Wetland Hydrology Present? <u>Y</u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Sandbar abutting Coal Creek.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: 6th Avenue Parkway Extension City/County: Aurora/Arapahoe Sampling Date: 3/17/2015
 Applicant/Owner: City of Aurora State: CO Sampling Point: SP-14
 Investigator(s): Keith Hidalgo, Jake Lloyd, Anthony Marshall Section, Township, Range: SEC 12 - T4S - 66W
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0-5
 Subregion (LRR): LRR G Lat: 39.719354 Long: -104.730081 Datum: NAD 83
 Soil Map Unit Name: Sandy alluvial land NWI classification: PEMA

Are climatic/hydrologic conditions on the site typical for this time of the year? Y (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "normal circumstances" present? Yes
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? <u>Y</u>	Is the Sampled Area Within a Wetland? <u>Y</u>
Hydric Soil Present? <u>Y</u>	
Indicators of Wetland Hydrology Present? <u>Y</u>	
If yes, optional wetland site ID: <u>Wetland CCE</u>	

Remarks: (Explain alternative procedures here or in a separate report.)
 Wetland area in additional survey area west of E-470 public Highway Authority offices. Area outlets into Coal Creek.

VEGETATION -- Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Dominance Test Worksheet	
1 <u>Populus deltoides</u>	20	Y	FAC	Number of Dominant Species that are OBL, FACW, or FAC: <u>3</u>	(A)
2 _____	_____	_____	_____	Total Number of Dominant Species Across all Strata: <u>3</u>	(B)
3 _____	_____	_____	_____	Percent of Dominant Species that are OBL, FACW, or FAC: <u>100.00%</u>	(A/B)
4 _____	_____	_____	_____		
5 _____	_____	_____	_____		
	20 = Total Cover				
<u>Sapling/Shrub Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Prevalence Index Worksheet	
1 <u>Salix interior</u>	20	Y	FACW	Total % Cover of:	Multiply by:
2 _____	_____	_____	_____	OBL species <u>65</u> x 1 = <u>65</u>	
3 _____	_____	_____	_____	FACW species <u>20</u> x 2 = <u>40</u>	
4 _____	_____	_____	_____	FAC species <u>20</u> x 3 = <u>60</u>	
5 _____	_____	_____	_____	FACU species <u>0</u> x 4 = <u>0</u>	
	20 = Total Cover			UPL species <u>0</u> x 5 = <u>0</u>	
				Column totals <u>105</u> (A) <u>165</u> (B)	
				Prevalence Index = B/A = <u>1.57</u>	
<u>Herb Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Hydrophytic Vegetation Indicators:	
1 <u>Typha angustifolia</u>	60	Y	OBL	1 - Rapid Test for Hydrophytic Vegetation	
2 <u>Lemna spp.</u>	5	N	OBL	<u>X</u> 2 - Dominance Test is >50%	
3 _____	_____	_____	_____	<u>X</u> 3 - Prevalence Index is ≤3.0 ¹	
4 _____	_____	_____	_____	4 - Morphological Adaptations ¹ (provide supporting data in Remarks or on a separate sheet)	
5 _____	_____	_____	_____	Problematic Hydrophytic Vegetation ¹ (Explain)	
6 _____	_____	_____	_____		
7 _____	_____	_____	_____		
8 _____	_____	_____	_____		
9 _____	_____	_____	_____		
10 _____	_____	_____	_____		
	65 = Total Cover				
<u>Woody Vine Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Hydrophytic Vegetation Present? <u>Y</u>	
1 _____	_____	_____	_____		
2 _____	_____	_____	_____		
	0 = Total Cover				
% /Bare Ground in Herb Stratum _____					

Remarks: (Include photo numbers here or on a separate sheet)
 Narrowleaf cattails growing within standing water.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
								Assumed hydric

¹Type: C = Concentration, D = Depletion, RM = Reduced Matrix, CS = Covered or Coated Sand Grains. ²Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) (LRR F) <input type="checkbox"/> 1 cm Muck (A9) (LRR F, G, H) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	<input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> High Plains Depressions (F16) (MLRA 72 & 73 of LRR H)
	<input type="checkbox"/> 1 cm Muck (A9) (LRR I, J) <input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H) <input type="checkbox"/> Dark Surface (S7) (LRR G) <input type="checkbox"/> High Plains Depressions (F16) (LRR H outside of MLRA 72 & 73) <input type="checkbox"/> Reduced Vertic (F18) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)

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

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? <u>Y</u>
Remarks: <p style="text-align: center;">Soil profile assumed to be hydric due to the abundance of cattails and open water.</p>	

HYDROLOGY

Wetland Hydrology Indicators:	
Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required)
<input checked="" type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Salt Crust (B11) <input type="checkbox"/> Aquatic Invertebrates (B13) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)
	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)

Field Observations: Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>12</u> Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes <u>X</u> No <u>X</u> Depth (inches): <u>?</u> (includes capillary fringe)	Indicators of Wetland Hydrology Present? <u>Y</u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
 Standing water within wetland pocket; saturation assumed but soil test not conducted due to obvious hydric soil indicators and lack of access due to standing water.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: 6th Avenue Parkway Extension City/County: Aurora Sampling Date: 7/16/15
 Applicant/Owner: Aurora State: CO Sampling Point: SP-15
 Investigator(s): Keith Hidalgo and Marissa Finney Section, Township, Range: Section 12 - T4S - R66W
 Landform (hillslope, terrace, etc.): streambank Local relief (concave, convex, none): concave Slope (%): 3 - 5
 Subregion (LRR): LRR G Lat: 39.718998 Long: -104.730027 Datum: NED 83
 Soil Map Unit Name: Sandy Alluvial Land NWI classification: PFOA

Are climatic/hydrologic conditions on the site typical for this time of the year? Y (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "normal circumstances" present? _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? <u>Y</u>	Is the Sampled Area Within a Wetland? <u>Y</u>
Hydric Soil Present? <u>Y</u>	
Indicators of Wetland Hydrology Present? <u>Y</u>	
If yes, optional wetland site ID: <u>Wetland CCD</u>	

Remarks:

Wetland between the floodplain OHWM on Coal Creek.

VEGETATION -- Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: _____)				Dominance Test Worksheet	
	Absolute % Cover	Dominant Species	Indicator Status		
1 <u>Populus deltoides</u>	50	Y	FAC	Number of Dominant Species that are OBL, FACW, or FAC: <u>4</u> (A)	
2 <u>Salix amygdaloides</u>	15	Y	FAC	Total Number of Dominant Species Across all Strata: <u>4</u> (B)	
3 _____				Percent of Dominant Species that are OBL, FACW, or FAC: <u>100.00%</u> (A/B)	
4 _____					
5 _____					
	65	= Total Cover			
<u>Sapling/Shrub Stratum</u> (Plot size: _____)				Prevalence Index Worksheet	
	Absolute % Cover	Dominant Species	Indicator Status		
1 <u>Salix interior</u>	50	Y	FACW	Total % Cover of: Multiply by:	
2 _____				OBL species <u>0</u> x 1 = <u>0</u>	
3 _____				FACW species <u>70</u> x 2 = <u>140</u>	
4 _____				FAC species <u>65</u> x 3 = <u>195</u>	
5 _____				FACU species <u>0</u> x 4 = <u>0</u>	
	50	= Total Cover		UPL species <u>0</u> x 5 = <u>0</u>	
				Column totals <u>135</u> (A) <u>335</u> (B)	
				Prevalence Index = B/A = <u>2.48</u>	
<u>Herb Stratum</u> (Plot size: _____)				Hydrophytic Vegetation Indicators:	
	Absolute % Cover	Dominant Species	Indicator Status		
1 <u>Typha angustifolia</u>	20	Y	FACW	<u>1</u> - Rapid Test for Hydrophytic Vegetation	
2 _____				<u>X</u> 2 - Dominance Test is >50%	
3 _____				<u>X</u> 3 - Prevalence Index is ≤3.0 ¹	
4 _____				4 - Morphological Adaptations ¹ (provide supporting data in Remarks or on a separate sheet)	
5 _____				Problematic Hydrophytic Vegetation ¹ (Explain)	
6 _____					
7 _____					
8 _____					
9 _____					
10 _____					
	20	= Total Cover		¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic	
<u>Woody Vine Stratum</u> (Plot size: _____)				Hydrophytic Vegetation Present? <u>Y</u>	
	Absolute % Cover	Dominant Species	Indicator Status		
1 _____					
2 _____					
	0	= Total Cover			
% Bare Ground in Herb Stratum _____					

Remarks:

Wetland vegetation along the banks and in the middle of the Coal Creek Channel.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 3	10YR3/2	100					sandy silt loam	dry
3 - 14	10YR3/2	100					sand	saturated
14 - 18	10YR3/2	85					sand	saturated
14 - 18	Gley13/N	15					sand	saturated

¹Type: C = Concentration, D = Depletion, RM = Reduced Matrix, CS = Covered or Coated Sand Grains. ²Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol (A1)	<input checked="" type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> 1 cm Muck (A9) (LRR I, J)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Dark Surface (S7) (LRR G)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> High Plains Depressions (F16)	
<input type="checkbox"/> Stratified Layers (A5) (LRR F)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> (LRR H outside of MLRA 72 & 73)	
<input type="checkbox"/> 1 cm Muck (A9) (LRR F, G, H)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Reduced Vertic (F18)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	<input checked="" type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)	<input type="checkbox"/> High Plains Depressions (F16) (MLRA 72 & 73 of LRR H)		
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)			

Restrictive Layer (if observed): Type: <u>Compacted sand</u> Depth (inches): <u>18"</u>	Hydric Soil Present? <u>Y</u>
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Remarks:
Sandy Soil. Young soil, may have sandy gleyed matrix, otherwise assumed hydric.

HYDROLOGY

Wetland Hydrology Indicators:	
Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required)
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres on Living
<input checked="" type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Roots (C3) (where tilled)
<input checked="" type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)
<input type="checkbox"/> Salt Crust (B11)	
<input checked="" type="checkbox"/> Aquatic Invertebrates (B13)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Oxidized Rhizospheres on Living	
<input type="checkbox"/> Roots (C3) (where not tilled)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations (of the wetland area):	Indicators of Wetland Hydrology Present? <u>Y</u>
Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>3</u>	
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>3</u>	
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>3</u> (includes capillary fringe)	

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

Remarks:
Hydrology associated with the presence of Coal Creek.