



Wetland Mitigation/Enhancement & Prairie & Riparian Habitat Creations

Hogan Pancost Property
Boulder County, Colorado

prepared for:

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November 2010



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1.0 Introduction

The proposed Boulder Creek Commons project, which includes the 19.44 acre West Parcel and the 2.73 acre East Parcel (Figure 1), would impact City of Boulder (City) regulatory and U.S. Army Corps of Engineers (Corps) jurisdictional wetlands, create wetland mitigations, restore temporary wetland impacts, enhance wetlands, and create native prairies and woody riparian habitats. These creations and enhancements would augment the ecological value of the project site and increase the functions and values of the wetlands, especially the wildlife habitat and water quality functions. Details of the wetland impacts, mitigations, enhancements, and creations are discussed below per parcel.

Please note, Figures are located in Section 8.0 and Tables are in Section 9.0.

2.0 Potential Wetland Impacts

Based on the 2008 wetland delineation, which used the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual, the proposed project would impact City regulatory Wetlands A, B, and C (Figure 2). The total City regulatory wetland impact is 0.465 acres. Please note, Dry Creek Ditch #2 and the Howard Super-phosticle Ditch are not considered regulatory by the City but are considered jurisdictional by the Corps. In November 2008, a Wetland Permit Application was submitted to the Corps for the piping of Dry Creek Ditch #2. On December 12, 2008, the Corps issued Permit No. 1992-80-484 for the piping of the Ditch. This permit was recently updated (See Appendix A).

In the near future, if Dry Creek Ditch #2 is piped, the hydrology that supports Wetlands A, B, and C will be eliminated. If this occurs, Wetlands A, B, and C will not have a wetland hydrology due to the loss of the seepage of irrigation water from the Ditch, and they will not meet the hydrology standards required for classification as wetlands by the 1987 Corps Manual (Environmental Laboratory, 1987). Therefore, the current estimate of wetland impacts and the proposed mitigation is based upon the existing condition, which would change when the wetlands are delineated using the 1987 Corps Manual during the growing season following the piping of Dry Creek Ditch #2. The 25 foot wide buffer areas of Wetlands A, B and C encompass approximately 0.876 acres of upland pastureland on the project site.

The 0.227 acre Wetland A on the West Parcel will be temporarily impacted during construction of the bioswale. Most of this wetland can be restored at a ratio of (1:1) to its initial area of growth. The part that cannot be restored to the initial area of growth, in the proposed bioswale, will be mitigated adjacent to the wetland at a creation-impact ratio of (2:1). Please note, Wetlands B and C cannot be retained or mitigated on the West Parcel because the seepage from the irrigation ditch which supports them will disappear when Dry Creek Ditch #2 is piped. Therefore, impacts to Wetlands B and C will be mitigated at a ratio of (2:1) on the East Parcel. The mitigation of impacts to the Corps jurisdictional Dry Creek Ditch #2 is not discussed in this report.

3.0 West Parcel

3.1 Background

The West Parcel is characterized by a 9.904 acre degraded pastureland, 8.260 acres of weeds, 0.465 acres of City regulatory wetlands, 0.330 acres of irrigation ditches, 0.421 acres of roads and other disturbed areas, and 0.058 acres of structures. Plans are being developed to pipe the agricultural irrigation water in Dry Creek Ditch #2, located along the west boundary of the project site, from the southwest corner of the property to the existing underground pipe on City of Boulder property about 100 feet north of the northwest corner of the project site. In addition, a stormwater bioswale will be constructed to convey those stormwater flows originating on-site and

off-site in excess of the capacity of the Dry Creek Ditch #2 pipe (71 cubic feet per second) to the northwest corner of the project site. See Figures 3 and 4.

Following development, the West Parcel will contain 6.567 acres of high quality native habitats. This native habitat will encompass a stormwater bioswale with 1.785 acres of tall and shortgrass prairie habitat, the 0.295 acre restored/created Wetland A, plus 4.487 acres of shortgrass prairie with riparian trees and shrubs around the bioswale and property boundaries. The West Parcel enhancements and restorations/creations are described below and illustrated by Figure 5.

3.2 Prairie Bioswale Habitat

3.2.1 Landform

The 52 foot wide drainage channel, referred to as the Prairie Bioswale Habitat, would have an eight foot wide lower swale with a 4:1 side slope and a 16 foot wide upper bench with a 3:1 side slope (Figure 3) and contain 1.785 acres of prairie and riparian habitat. The upper bench would have a four foot wide pedestrian trail.

The two year storm event would have a flow of 10.53 cfs which will be confined to the lower swale and rise to a height of 1.23 feet. Similarly, the 10 year storm event would have a flow of 25.32 cfs which would rise to a height of 1.92 feet, and also be confined to the lower swale. Both the local and regional 100 year storm events would expand to the upper bench of the swale. Rock and cobble would be added at the outfall of culverts under roads to reduce erosion.

3.2.2 Vegetation

A tallgrass prairie will be created in the moist soils on the bottom of the lower bioswale, and a shortgrass prairie will be created on the drier habitats of the bench and side slopes of the upper swale (Figure 4). The tallgrass prairie will be characterized by seven grasses and seven forbs native to tallgrass prairies in Colorado (Table 1) with riparian shrubs and trees. The shortgrass prairie will be characterized by seven grasses and seven forbs (Table 2). Similarly, these species are all common to the shortgrass prairie of Colorado. Eight shrubs common to prairies near the foothills will be planted in the shortgrass prairie on the upper bench and side slopes of the drainage swale (Table 3). The shrubs will be planted in small stands composed of 8-10 plants of each species in appropriate habitats.

3.3 Wetland A Restoration

The 0.227 acre Wetland A, located in the southwest corner of the project site, would be impacted when the bioswale is constructed. However, the bioswale would be designed to create a landscape appropriate for the restoration/creation of Wetland A. Specifically, a basin will be constructed in the southwest corner of the property east of the inlet to the pipe for Dry Creek Ditch #2. This basin would have a topography within the seasonally high groundwater table associated with the Lateral along the CD Bodam parcel where it is not lined (Figure 3). That portion of Wetland A restored to the area of impact would be considered a restoration, and that portion restored outside the impact area would be considered a creation. The total area of wetland restoration (1:1) is 0.159 acres, and the area of creation (2:1) is 0.136 acres.

Wetland A, which is dominated by herbaceous plants, will be restored by salvaging wetland plants and topsoil from the existing wetland and by using native wetland seed and live plants. First, the topsoil and salvaged wetland plants will be applied. Next, the site will be seeded with the seed mix of Table 4 which is characterized by seven grasses, nine sedges and rushes, and six forbs. All of these wetland plants are common to wetlands on the plains of eastern Colorado. Next, the greenhouse grown shrubs, grasses, sedges/rushes, and forbs of Table 5 will be planted in appropriate habitats, depending on the success of the salvaged plant material and the seed mix.

3.4 Prairie & Riparian Enhancements

The 4.487 acres of landscape surrounding the bioswale and located along property boundaries (Figure 5) will be seeded to the shortgrass prairie seed mix of Table 2. Riparian trees, including plains cottonwood (*Populus deltoides*) and peachleaf willow (*Salix amygdaloides*) will be planted in small stands throughout the prairie seeding. In addition, small stands composed of 8-10 plants each of the eight prairie and riparian shrubs of Table 3 will be planted throughout the prairie and riparian habitat. The margins of the Howard Super-phosticle Ditch on the east end of the West Parcel are located in the enhancement area. Similarly, this area will be enhanced with peachleaf willows, plains cottonwoods, and the eight shrub species of Table 3 to create a riparian corridor.

4.0 East Parcel

4.1 Background

The 2.73 acre East Parcel is characterized by 1.622 acres of degraded wetlands, 0.324 acres of a plains cottonwood forest, 0.689 acres of introduced pasture grasses, and 0.095 acres of weeds in upland habitats (Figure 6). In addition, the wetlands on this Parcel are degraded by dense populations of undesirable weeds. No development is planned for this parcel. The East Parcel will have a trail with interpretive signage.

One of the goals of the proposed development is to significantly enhance the ecological value of the East Parcel. This will be achieved by increasing the acreage of wetlands, creating new wetlands in upland sites to compensate for potential project wetland impacts on the West Parcel, enhancing existing wetlands with trees and shrubs to increase structural diversity, creating a tallgrass prairie, expanding the size of the existing plains cottonwood forest, and creating a peachleaf willow forest.

4.2 Wetland Mitigation

The 0.238 acre wetland impact to City regulatory Wetlands B and C will be mitigated on three upland sites on the East Parcel by creating 0.476 acres of wetlands (Figure 6). This represents a creation-impact ratio of 2:1 (0.238 acres x 2). Wetland creation sites include two upland areas surrounded by wetlands, along with most of the large upland area on the west end of the parcel. The landscape of these sites will be lowered into the seasonally high groundwater table and the sites will be seeded and planted with the species of Tables 4 and 5. A herbaceous wetland with stands of native shrubs including sandbar willow (*Salix exigua*), thinleaf alder (*Alnus tenuifolia*), chokecherry (*Prunus virginiana ssp. melanocarpa*), and golden currant (*Ribes aureum*) will be created.

4.3 Wetland Enhancements

First, populations of teasel (*Dipsacus fullanum*), Canada thistle (*Cirsium arvense*) and other invasive weeds in the 1.622 acre East Wetland and in the upland habitats will be eradicated. Next, stands of native wetland and riparian shrubs, including sandbar willow, chokecherry, thinleaf alder, and golden currant will be planted on 0.158 acres of the 1.622 acre wetland. Plains cottonwood and peachleaf willow trees will be planted on 0.094 acres, on the drier sites within the wetland.

4.4 Upland Enhancements

4.4.1 Tallgrass Prairie

The elevation of 0.093 acres of uplands on the west end of the East Parcel will be lowered about 2 to 3 feet to create conditions appropriate for a tallgrass prairie; seasonally moist, but not saturated soils (Figure 7). The tallgrass prairie habitat will be seeded with the seed mix of Table 1.

4.4.2 Peachleaf Willow Forest

A stand of about 15 peachleaf willows will be planted along the south boundary of the tallgrass prairie and approximately 20 peachleaf willow trees will be planted on ten foot centers in an upland inclusion in the middle of the wetland. The area of the peachleaf willow forest will be about 0.090 acres.

4.4.3 Plains Cottonwood Forest

Plains cottonwoods will be planted in three areas (Figure 7). First, the existing 0.324 acre stand of plains cottonwood forest on the east end of the East Parcel will be extended west to the upland habitat between the existing forest and wetland. Approximately 15 plains cottonwood trees will be planted on 15 foot centers in this upland habitat. Plains cottonwood trees will also be planted in two linear stands along 55th Street. The west-most stand would have about 15 trees and the east-most stand, which includes both wetland and upland habitat, extends to the expanded plains cottonwood forest on the east end of the parcel and would have about 15 trees. In total, plains cottonwood trees will be planted over an additional 0.125 acres resulting in 0.449 acres of cottonwood forest on the East Parcel.

5.0 Wetland Buffer Impact Mitigation

Impacts to the 0.876 acre 25 foot wide buffers of Wetlands A, B and C would be mitigated by the creation of 6.272 acres of prairie and riparian habitat in and surrounding the bioswales on the West Parcel and by the creation of 0.308 acres of prairie and riparian habitat on the East Parcel. Thus, 6.58 acres of habitat with a high ecological value would mitigate the impact to 0.876 acres of pastureland habitat with a low ecological value. It should also be noted that 0.107 acres of the Howard Super-phosticle Ditch habitat on the West Parcel and 0.324 acres of the cottonwood forest on the East Parcel would be preserved. These high quality habitats would enhance the overall ecological value of the development and further mitigate wetland buffer impacts.

6.0 Wildlife Use

The development will preserve 2.053 acres of moderate quality wildlife habitat, which includes the 0.324 acre cottonwood forest and the 1.622 acre wetland on the East Parcel, and the 0.107 acres of the Howard Super-phosticle Ditch on the West Parcel, and create 4.487 acres of habitat on the West Parcel and 0.784 acres of habitat on the East Parcel. Thus, the 22.17 acre development will contain 9.404 acres of high quality habitat, including cottonwood and peachleaf willow forests (0.539 acres), irrigation ditches (0.107 acres), wetlands (2.393 acres), and prairies with riparian tree and shrub habitat (6.365 acres) in the bioswales and along the property boundary. See Table 6. These structurally and floristically diverse communities will provide excellent habitat for wildlife. The wildlife value of these communities will be further enhanced with raptor perching poles, bluebird boxes, and other wildlife enhancements.

7.0 Summary

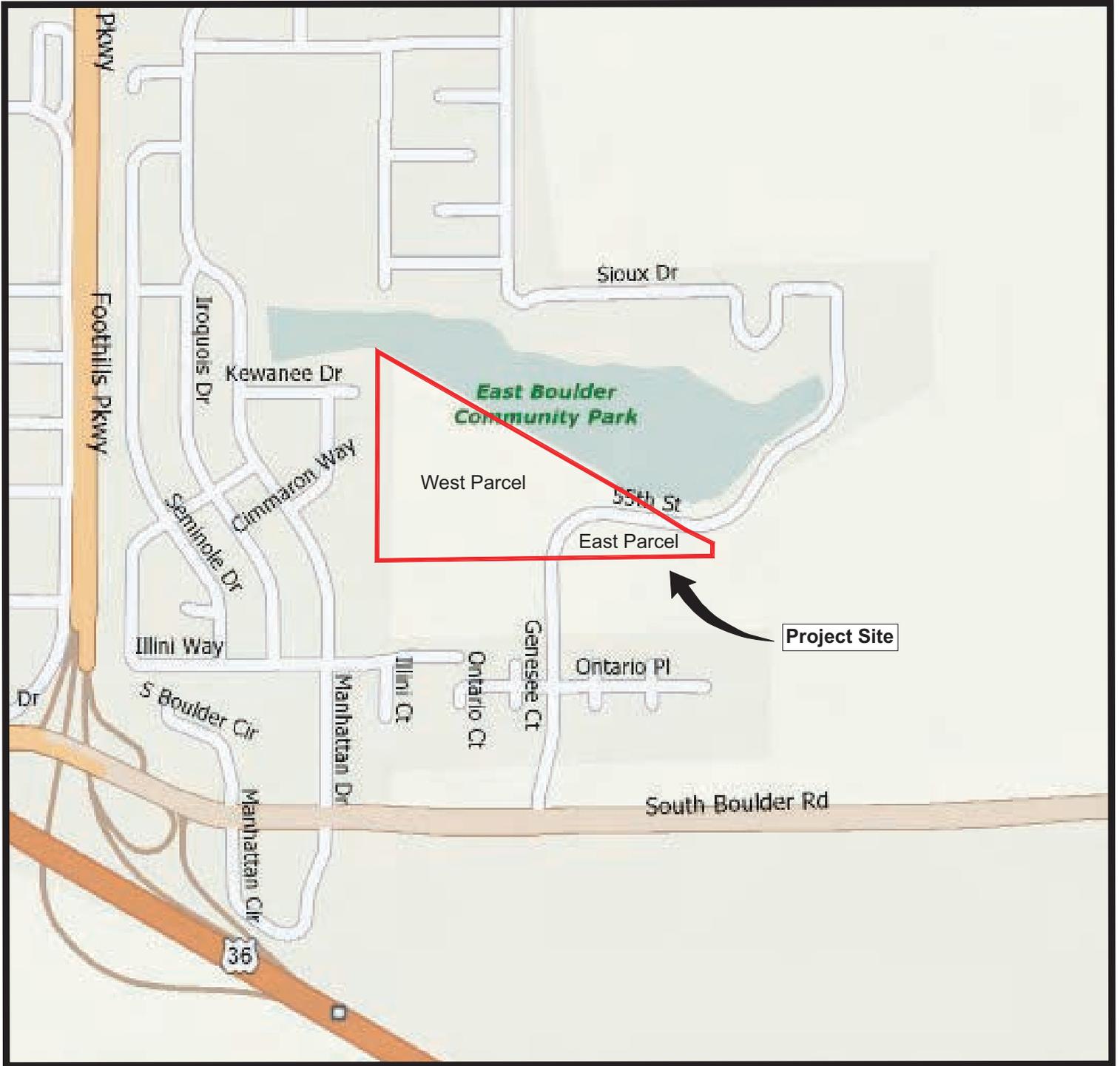
The 22.17 acre development will contain 9.404 acres of native habitat including riparian forests, wetlands, and prairies with riparian trees and shrubs (Table 6). The native habitat will represent 42.42% of the total project site.

The 19.44 acre West Parcel will contain 6.567 acres of native habitat, including 0.295 acres of wetlands, a 1.785 acre stormwater bioswale characterized by tallgrass and shortgrass prairies with riparian trees and shrubs, a 4.447 acre prairie with riparian trees and shrubs on the landscape surrounding the bioswale and along the boundary of the property, and the 0.107 acre Howard Super-phosticle Ditch. The total created and preserved habitats represent 33.78% of the West Parcel.

The 2.73 acre East Parcel is characterized by wetland and upland habitats degraded by a past agricultural land use and by large populations of invasive weeds. No development is planned for this parcel. A major goal of the project is to eradicate weeds, enhance the existing wetlands with trees and shrubs, create new structurally diverse wetlands, expand the existing plains cottonwood forest, create a peachleaf willow forest, and create a tallgrass prairie. The East Parcel will contain 2.098 acres of wetlands, 0.539 acres of riparian forest and 0.093 acres of tallgrass prairie. In addition, existing wetlands will be enhanced with 0.158 acres of riparian shrubs and 0.094 acres of plains cottonwood trees.

Please note, the 6.272 acres of upland habitat creations mitigate impacts to the 0.876 acre buffer areas of Wetlands A, B and C. In addition, the preservation of 0.431 acres of high quality habitat on the East and West Parcels would further mitigate wetland buffer impacts.

8.0 Figures



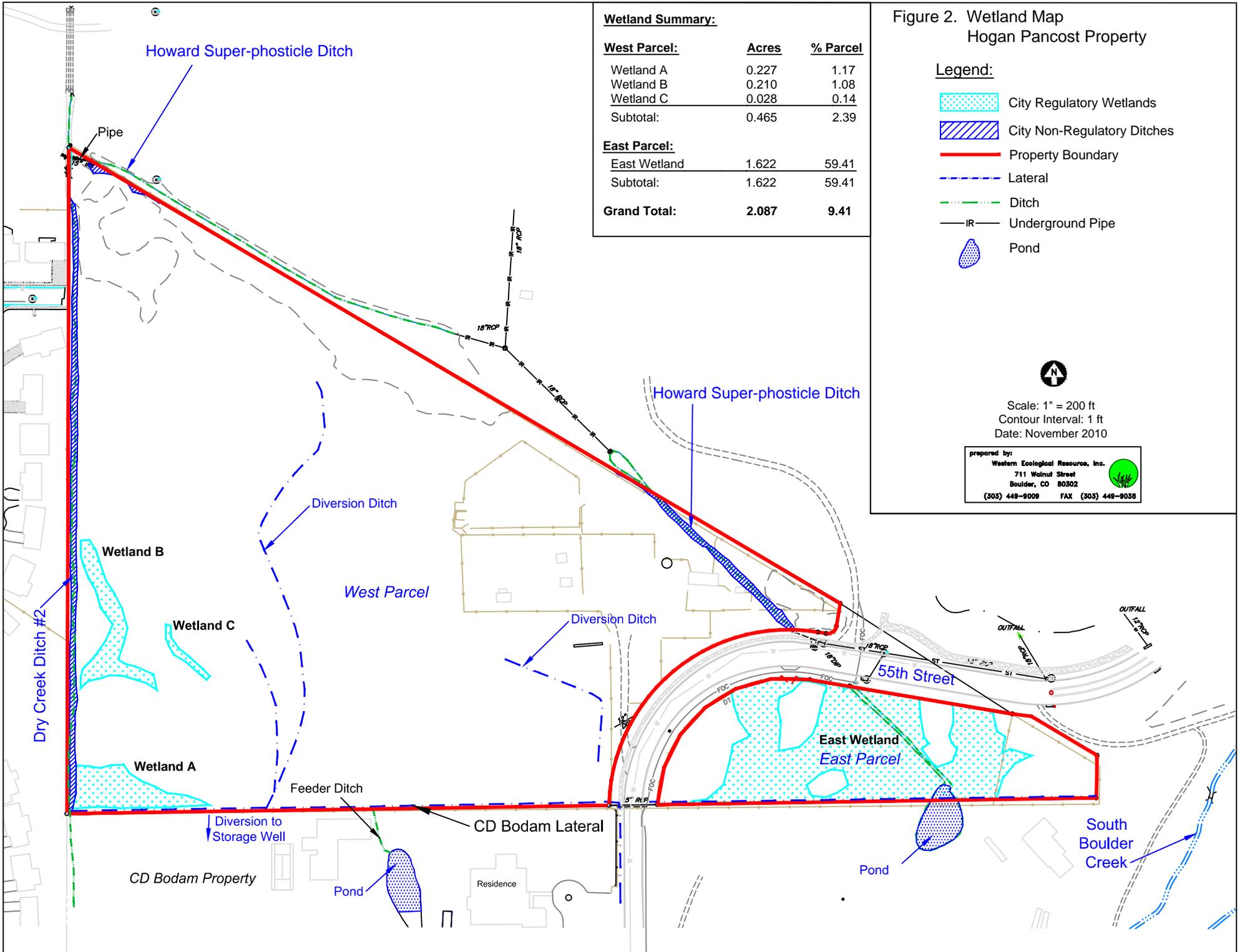
BASE: Map Data Mapquest 2008 NAVETQ or TeleAtlas

**FIGURE 1. Vicinity Map
Hogan Pancost Property**



Scale 1" = 600'





Wetland Summary:

West Parcel:	Acres	% Parcel
Wetland A	0.227	1.17
Wetland B	0.210	1.08
Wetland C	0.028	0.14
Subtotal:	0.465	2.39

East Parcel:	Acres	% Parcel
East Wetland	1.622	59.41
Subtotal:	1.622	59.41

Grand Total:	Acres	% Parcel
	2.087	9.41

Figure 2. Wetland Map
Hogan Pancost Property

- Legend:**
- City Regulatory Wetlands
 - City Non-Regulatory Ditches
 - Property Boundary
 - Lateral
 - Ditch
 - Underground Pipe
 - Pond

Scale: 1" = 200 ft
 Contour Interval: 1 ft
 Date: November 2010

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Figure 3. Stormwater Prairie Bioswale Plan View

Legend:

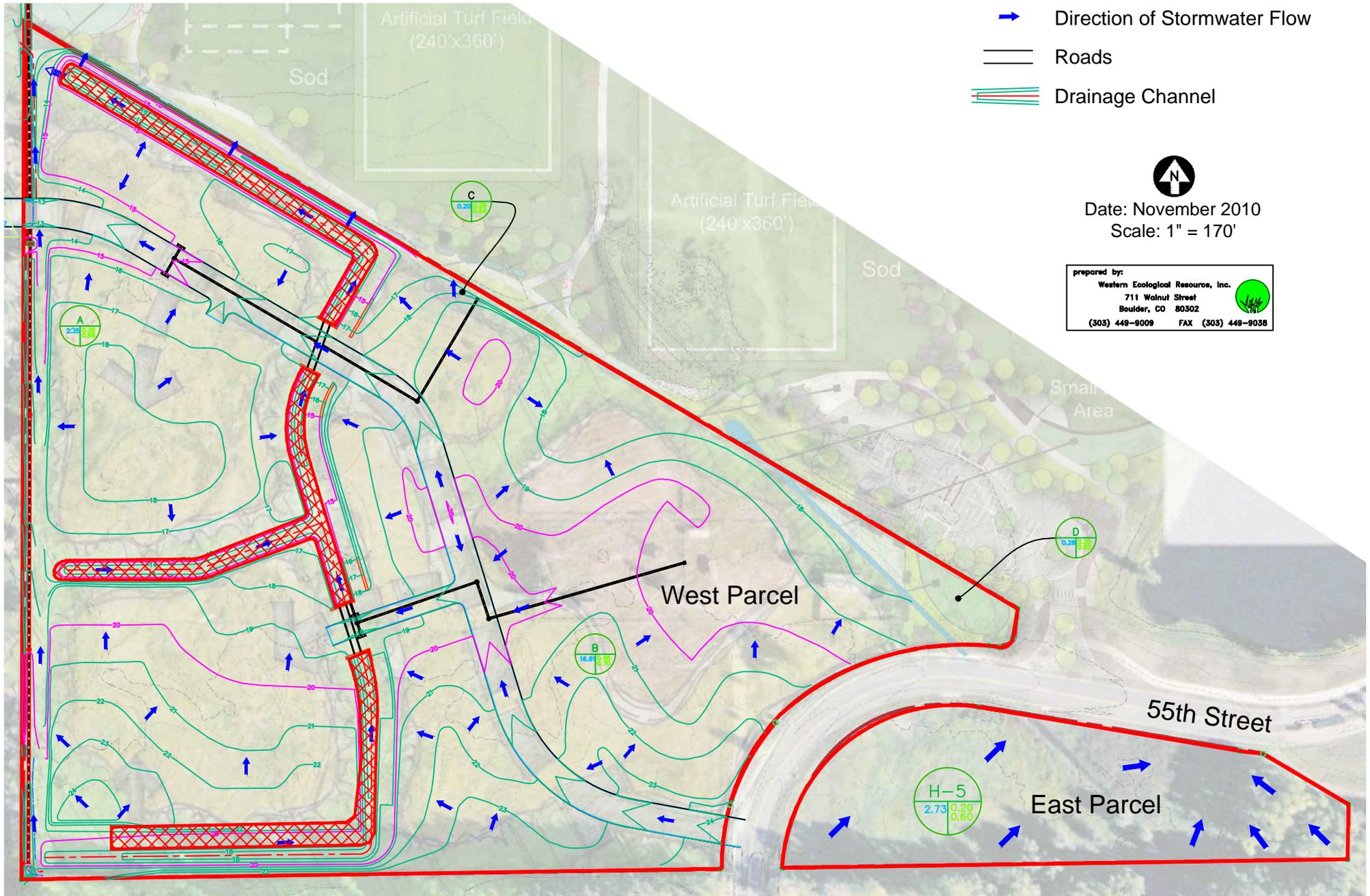
- Project Boundary
- Direction of Stormwater Flow
- Roads
- Drainage Channel



Date: November 2010

Scale: 1" = 170'

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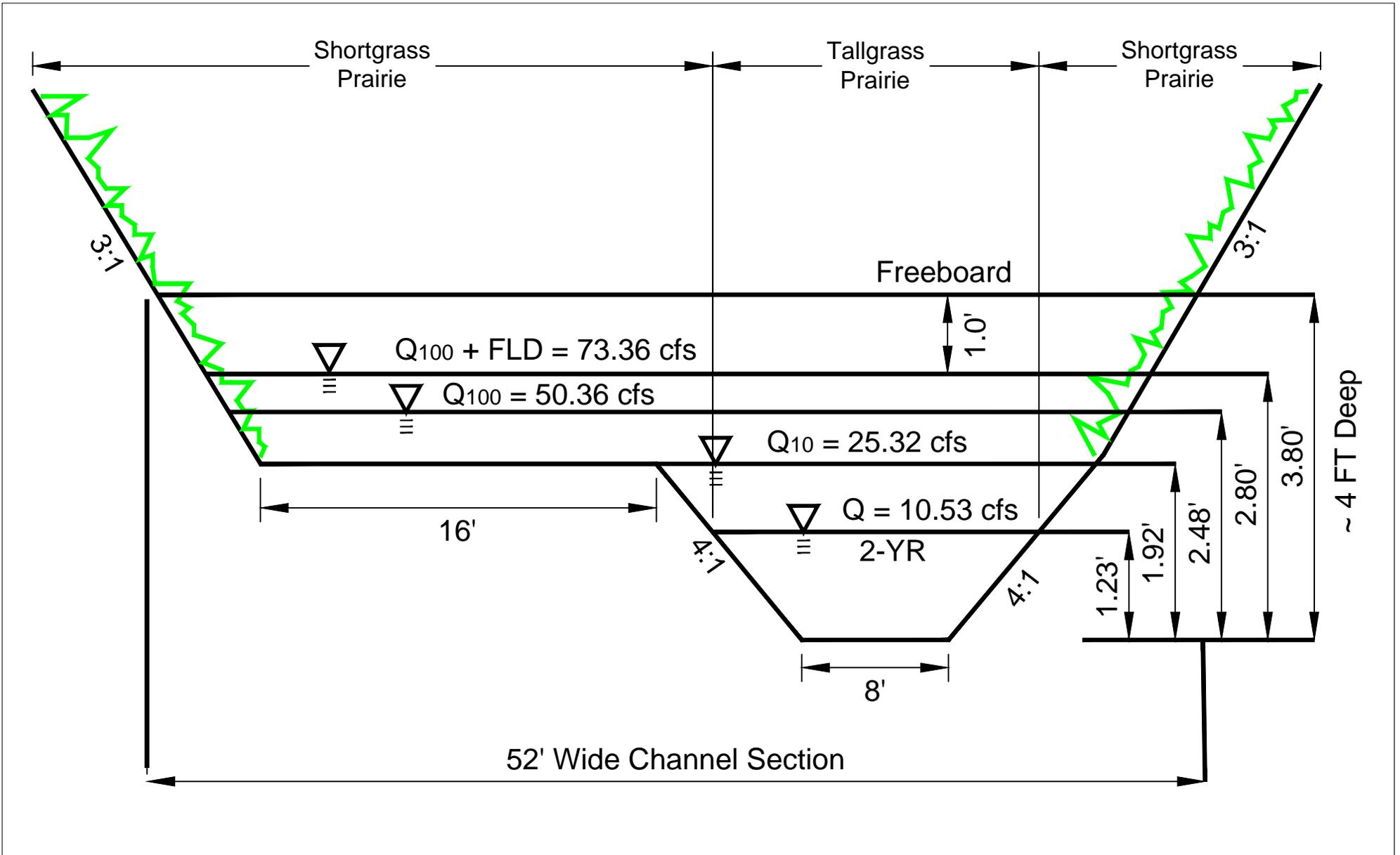


Figure 4. Stormwater Prairie Bioswale Cross Section

Figure 5. West Parcel Enhancements and Restorations



Legend:

- Project Boundary
- Prairie Bioswale Habitat
1.785 Acres (not to scale)
- Wetland Restoration/Creation
0.295 Acre (not to scale)
- Prairie and Riparian Habitat
4.487 Acre



Date: November 2010
Scale: 1" = 170'

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Legend:

- WT  Wetlands
- W  Weedy Habitat
- CF  Cottonwood Forest
- P  Pastureland


 Date: November 2010
 Scale: 1" = 110'

Figure 6. East Parcel Vegetation Types



LEGEND

- | | | | |
|--|-----------------------------|---|---------------------------------|
|  | Existing Wetlands |  | Proposed Cottonwood Trees |
|  | Existing Pond |  | Proposed Peachleaf Willow Trees |
|  | Existing Cottonwood Forest |  | Proposed Tallgrass Prairie |
|  | Proposed Wetland Mitigation |  | Proposed Shrub Stands |



Date: November 2010
 Scale: 1" = 110'

Figure 7. East Parcel Enhancements and Creations

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9.0 Tables

TABLE 1
Tallgrass Prairie Seed Mix
Hogan Pancost Project

<u>Scientific Name</u>	<u>Common Name</u>	<u>Seeding Rate</u> <u>PLS lbs./acre*</u>
Grasses		
<i>Andropogon gerardii</i>	Big bluestem	3
<i>Bouteloua curtipendula</i>	Sideoats grama	½
<i>Panicum virgatum</i>	Switchgrass	3
<i>Pascopyrum smithii</i>	Western wheatgrass	2
<i>Schizachyrium scoparium</i>	Little bluestem	1
<i>Sorghastrum nutans</i>	Indiangrass	3
<i>Spartina pectinata</i>	Prairie cordgrass	2
	Total Grasses	14½
Forbs		
<i>Asclepias speciosa</i>	Showy milkweed	¼
<i>Dalea purpurea</i>	Prairieclover	¼
<i>Helenium autumnale</i>	Sneezeweed	¼
<i>Helianthus nuttallii</i>	Marsh sunflower	1
<i>Liatris punctata</i>	Gayfeather	¼
<i>Ratibida columnifera</i>	Prairie coneflower	¼
<i>Solidago canadensis</i>	Canada goldenrod	¼
	Total Forbs	2½
	GRAND TOTAL	17

* Drill seed rate. Double application for broadcast methods.

TABLE 2
Shortgrass Prairie Seed Mix
Hogan Pancost Project

<u>Scientific Name</u>	<u>Common Name</u>	<u>Seeding Rate PLS lbs./acre*</u>
Grasses		
<i>Aristida purpurea</i>	Red threeawn	2
<i>Buchloe dactyloides</i>	Buffalograss	4
<i>Chondrosium gracile</i>	Blue grama	3
<i>Elymus elymoides</i>	Squirreltail	1
<i>Pascopyrum smithii</i>	Western wheatgrass	3½
<i>Poa secunda</i>	Sandberg bluegrass	½
<i>Stipa comata</i>	Needle and thread	2½
	Total Grasses	16½
Forbs		
<i>Artemisia frigida</i>	Fringed sage	1/16
<i>Erysimum asperum</i>	Plains wallflower	1/16
<i>Gaillardia aristata</i>	Blanket flower	1/4
<i>Liatris punctata</i>	Gayfeather	1/4
<i>Ratibida columnifera</i>	Prairie coneflower	1/4
<i>Rudbeckia hirta</i>	Gloriosa daisy	1/16
<i>Sphaeralcea coccinea</i>	Scarlet globemallow	1/16
	Total Forbs	1
	Grand Total	17½

* Drill seed rate. Double application for broadcast methods.

TABLE 3
Prairie Shrub Planting
Hogan Pancost Project

<u>Scientific Name</u>	<u>Common Name</u>
Shrubs	
<i>Chrysothamnus nauseosus</i>	Rubber rabbitbrush
<i>Prunus americanus</i>	American plum
<i>Prunus virginiana</i>	Chokecherry
<i>Rhus trilobata</i>	Sumac
<i>Ribes cereum</i>	Wax currant
<i>Rosa woodsii</i>	Woods' rose
<i>Symphoricarpos occidentalis</i>	Snowberry
<i>Yucca glauca</i>	Soapweed

TABLE 4
Wetland Seed Mix
Hogan Pancost Project

<u>Scientific Name</u>	<u>Common Name</u>	<u>Wetland Status*</u>	<u>Seeding Rate</u> <u>PLS lbs./acre</u>
Grasses			
<i>Andropogon gerardii</i>	Big bluestem	FAC-	1
<i>Glyceria grandis</i>	American mannagrass	OBL	4
<i>Poa palustris</i>	Fowl bluegrass	FACW	¼
<i>Puccinellia airoides</i>	Nuttall alkaligrass	OBL	¼
<i>Sorghastrum nutans</i>	Indiangrass	FACU	1
<i>Spartina pectinata</i>	Prairie cordgrass	FACW	4
<i>Sporobolous airoides</i>	Alkali sacaton	FAC	½
		Total Grasses	11
Sedges & Rushes			
<i>Carex lanuginosa</i>	Woolly sedge	OBL	2
<i>Carex nebrascensis</i>	Nebraska sedge	OBL	2
<i>Carex praegracilis</i>	Clustered field sedge	FACW	¾
<i>Eleocharis palustris</i>	Creeping spikerush	OBL	1
<i>Juncus arcticus ssp. ater</i>	Baltic rush	OBL	1/8
<i>Juncus torreyi</i>	Torrey's rush	FACW+	1/8
<i>Scirpus acutus</i>	Hardstem bulrush	OBL	2
<i>Scirpus paludosus</i>	Alkali bulrush	OBL	2
<i>Scirpus pungens</i>	Threesquare bulrush	OBL	3
		Total Sedges & Rushes	13
Forbs			
<i>Asclepias incarnata</i>	Swamp milkweed	OBL	1
<i>Helenium autumnale</i>	Sneezeweed	FACW	¼
<i>Helianthus nuttallii</i>	Marsh sunflower	FAC	2
<i>Polygonum pennsylvanicum</i>	Giant smartweed	OBL	2
<i>Sagittaria latifolia</i>	Arrowhead	OBL	2
<i>Solidago canadensis</i>	Canada goldenrod	FACU	1/8
		Total Forbs	7 3/8
		GRAND TOTAL	31 3/8

* Wetland Status

OBL = Obligate Wetland
 FACW = Facultative Wetland
 FAC = Facultative
 FACU = Facultative Upland
 UPL = Obligate Upland
 NI = No Indicator (insufficient information)

TABLE 5
Wetland Plantings
Hogan Pancost Project

<u>Scientific Name</u>	<u>Common Name</u>	<u>Wetland Status*</u>
Shrubs		
<i>Alnus tenuifolia</i>	Thinleaf alder	NO
<i>Prunus virginiana</i>	Chokecherry	FACU
<i>ssp. melanocarpa</i>		
<i>Ribes aureum</i>	Golden currant	FACW
<i>Salix exigua</i> #	Sandbar willow	OBL
Grasses		
<i>Beckmannia schizachne</i>	Sloughgrass	OBL
<i>Glyceria grandis</i>	American mannagrass	OBL
<i>Poa palustris</i>	Fowl bluegrass	FACW
Sedges & Rushes		
<i>Carex nebrascensis</i>	Nebraska sedge	OBL
<i>Eleocharis palustris</i>	Creeping spikerush	OBL
<i>Juncus torreyi</i>	Torrey's rush	FACW+
<i>Scirpus acutus</i>	Hardstem bulrush	OBL
<i>Scirpus americanus</i>	Threesquare bulrush	OBL
<i>Scirpus maritimus</i>	Alkali bulrush	NI
Forbs		
<i>Acorus calamus</i>	Sweetflag	OBL
<i>Iris missouriensis</i>	Rocky Mountain iris	OBL
<i>Sagittaria latifolia</i>	Arrowhead	OBL
<i>Sparganium eurycarpum</i>	Burreed	OBL

Sandbar willows to be started from cuttings

* Wetland Status

OBL = Obligate Wetland

FACW = Facultative Wetland

FAC = Facultative

FACU = Facultative Upland

UPL = Obligate Upland

NI = No Indicator (insufficient information)

TABLE 6
Restored, Created, Enhanced & Existing Habitat Summary
Hogan Pancost Property

<u>West Parcel</u>	<u>Acres</u>	<u>% of Parcel</u>
Habitat Creations		
Wetland A Restoration (1:1) / Creation (2:1)	0.295	1.52
Prairie Bioswale	1.785	9.18
Prairie & Riparian	4.487	23.08
Subtotal	6.567	33.78
Existing Habitat Preserved		
Howard Super-phosticle Ditch	0.107	0.55
Subtotal	0.107	0.55
Total Created & Preserved Habitats	6.674	34.33
Developed Areas		
Residences & Roads	12.766	65.67
Subtotal	12.766	65.67
Total West Parcel	19.440	100.00
 <u>East Parcel</u>		
Habitat Creations*		
Wetland Creations (B & C) (0.238 acres x 2)	0.476	17.44
Cottonwood Forest	0.125	4.58
Peachleaf Willow Forest	0.090	3.30
Tallgrass Prairie	0.093	3.40
Shrub Planting in Wetlands	(0.158)	N/A
Cottonwood Planting in Wetlands	(0.094)	N/A
Subtotal	0.784	28.72
Existing Habitat Preserved		
Wetland E#	1.622	59.41
Cottonwood Forest	0.324	11.87
Subtotal	1.946	71.28
Total Created & Preserved Habitats	2.730	100.00
Total East Parcel	2.730	100.00
 <u>West & East Parcels</u>		
Native Habitats	9.404	42.42
Developed##	12.766	57.58
Total East & West Parcels	22.170	100.00

* Replaces 0.784 acres of upland habitat.

Wetland E will be enhanced with 0.094 acres of riparian trees and 0.158 acres of shrubs.

Please note, the developed area may also contain open space.

Appendix A. Wetland Permit for Piping Dry Creek Ditch #2



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
DENVER REGULATORY OFFICE, 9307 SOUTH WADSWORTH BOULEVARD
LITTLETON, COLORADO 80128-6901

December 12, 2008

Mr. David Johnson
Western Ecological Resource, Inc.
711 Walnut Street
Boulder, CO 80302

**RE: Piping and Realignment of the Dry Creek Ditch #2 on the Hogan Pancost Property and
Jurisdictional Determinations
Nationwide Permit No. 29, Corps File No. 199280484**

Dear Mr. Johnson:

Reference is made to the above-mentioned project on behalf of MacKenzie House, LLC. This project will result in the loss of 0.261 acre of the Dry Creek Ditch #2 wetlands located in the SW ¼ of Section 4, T1S, R70W, Boulder County, Colorado.

Based on the information provided, this office has determined that the work within Colorado is authorized by the **Department of the Army Nationwide Permit No. 29**, found in the March 12, 2007, Federal Register. Enclosed is a fact sheet, which fully describes this Nationwide Permit and lists the General Conditions, Section 404 Only Conditions, and Colorado Regional Conditions, which must be adhered to for this authorization to remain valid.

Permit No. 29 (Corps File No. 199280484) Special Condition:

The permittee will purchase 0.261 acre of mitigation credit from the Middle South Platte River Wetland Mitigation Bank, which has been approved by the Corps of Engineers. The credits must be purchased prior to impacts occurring to wetlands authorized by this permit. Written proof of the mitigation credit purchase shall be provided to the Denver Regulatory Office. Upon receipt of such proof, all liabilities for the success, monitoring, and long-term management of the mitigation bank wetlands covered by this authorization will become the responsibility of the mitigation bank sponsor. Once this office receives the proof of purchase for the required mitigation credits the permittee will have satisfied all mitigation requirements for this permit.

Although an Individual Department of the Army permit will not be required for this work, this does not eliminate the requirement that any other applicable Federal, state, tribal or local permits be obtained as required. Please be advised that deviations from the original plans and specifications of this project could require additional authorization from this office.

The applicant is responsible for all work accomplished in accordance with the terms and conditions of the nationwide permit. If a contractor or other authorized representative will be accomplishing the work authorized by the nationwide permit on behalf of the applicant, it is strongly recommended that they be provided

a copy of this letter and the attached conditions so that they are aware of the limitations of the applicable nationwide permit. Any activity which fails to comply with all the terms and conditions of the nationwide permit will be considered unauthorized and subject to appropriate enforcement action.

This verification will be valid until December 12, 2010. In compliance with General Condition 26, the attached "Certification of Completed Work" form (blue) must be signed and returned to this office upon completion of the authorized work and any required mitigation.

The U.S. Fish and Wildlife Service has listed the **Preble's meadow jumping mouse** (*Zapus hudsonius preblei*) as a Federal threatened species under the Endangered Species Act of 1973. However, it has been determined that the proposed activity will not affect the mouse or its designated critical habitat. Also, this proposed activity would not affect the **Ute ladies' tresses orchid** (*Spiranthes diluvialis*) or its proposed critical habitat. Should anyone at any time become aware that either an endangered and/or threatened species or its critical habitat exists within the project area, this office must be notified immediately.

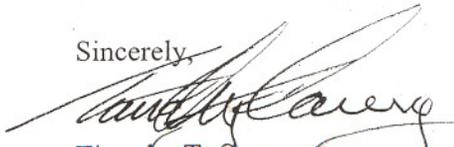
Approved jurisdictional determinations (JDs) have been completed for the Dry Creek Ditch #2 and CD Bodam Lateral; the Howard Super-phosticle Ditch and abutting East Wetland. The JDs are attached. Dry Creek Ditch #2 and CD Bodam Lateral; the Howard Super-phosticle Ditch and Abutting East Wetland were determined to be jurisdictional and are known as "Waters of the United States." They are regulated under Section 404 of the Clean Water Act. If you are not in agreement with the JD decisions, you may request an administrative appeal under regulation 33 CFR 331, by using the attached Appeal Form and Administrative Appeal Process form. The request for appeal must be received within 60 days from the date of this letter. If you would like more information on the jurisdictional appeal process, contact this office. It is not necessary to submit a Request for Appeal if you do not object to the JDs. These JDs are valid for a period of five years from the date of this letter, unless new information warrants revisions of the JDs before the expiration date, or unless the Corps has identified, after a possible public notice and comment, that specific geographic areas with rapidly changing environmental conditions merit re-verification on a more frequent basis.

Wetlands A, B, C, the two Diversion Ditches and the Feeder Ditch are not waters of the U.S. These are artificially irrigated areas which would revert to upland if the irrigation ceased and irrigation ditches constructed on dry land. These waters and their general consideration as nonWOUS can be found in the Preamble of the Federal Register pertaining to the USACE Clean Water Act Regulatory Program, 33 CFR Parts 320 through 332, under Section 328.3: Definitions.

A Department of the Army (DA) Permit will not be required for work in wetlands A, B, C, the two Diversion Ditches and the Feeder Ditch. Although a DA Permit will not be required for work in these wetlands and ditches, this does not eliminate the requirement that other applicable federal, state, and local permits be obtained as needed.

If there are any questions call **Mr. Terry McKee** of my office at **(303) 979-4120** and reference **Corps File No. 199280484**.

Sincerely,



Timothy T. Carey
Chief, Denver Regulatory Office