US 50 West: Wills Boulevard to McCulloch Boulevard (Milepost 313 to Milepost 307)

Project Number: STA 0503-088
Project Code: 20448

Water Quality and Floodplains Technical Report

Prepared for:

Colorado Department of Transportation, Region 2
905 Erie Avenue
Pueblo, CO 81002

Prepared by:

Felsburg Holt & Ullevig
6300 South Syracuse Way, Suite 600
Centennial, CO 80111
(303) 721-1440

FHU Reference No. 112407-05

May 2016

Table of Contents

List of Figures

List of Tables

List of Acronyms and Abbreviations

µg/L	micrograms per liter
Ave	Avenue
BFE	base flood elevation
Blvd	Boulevard
BMPs	best management practices
CBC	concrete box culvert
CDPHE	Colorado Department of Public Health and Environment
CDOT	Colorado Department of Transportation
CDPS	Colorado Discharge Permit System
CLOMR	Conditional Letter of Map Revision
EA	environmental assessment
EDB	extended detention basin
FHAD	Flood Hazard Area Delineation
FHU	Felsburg Holt & Ullevig
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
LOMR	Letter of Map Revision
MS4	Municipal Separate Storm Sewer System
PEL	Planning and Environmental Linkages
PWMD	Pueblo West Metropolitan District
Rd	Road
ROW	right-of-way
Se	Selenium
SWMP	Stormwater Management Plan
TSS	total suspended solids
US 50	United States Highway 50
WQCV	Water Quality Capture Volume
WSE	water surface elevation

1. Introduction

This environmental assessment (EA) is for safety and capacity improvements to US Highway 50 (US 50) between Wills Boulevard (Blvd) and McCulloch Blvd that the Colorado Department of Transportation (CDOT) is proposing, in consultation with Federal Highway Administration (FHWA), within the City of Pueblo, Pueblo County, and Pueblo West Metropolitan District (PWMD). This project is the third in a sequence of improvements that CDOT is making to US 50, all under the framework of the *US 50 West Planning and Environmental Linkages (PEL) Study* (CDOT, 2012a). The US 50 West PEL established the purpose and need, evaluated a full range of alternatives, and developed the *US 50 West PEL Implementation Plan* (CDOT, 2012b) for the PEL recommended Preferred Alternative within a 12-mile corridor from Swallows Road to Baltimore Avenue. Safety and capacity improvements included in the PEL recommended Preferred Alternative generally consist of widening US 50 from four lanes to six lanes from McCulloch Blvd to Wills Blvd and establishing grade-separated interchanges at McCulloch Blvd, Purcell Blvd, and Pueblo Blvd. US 50 would remain a four-lane highway west of McCulloch Blvd.

At the completion of the PEL Study, funds were not available to construct the recommended improvements for the entire PEL Corridor, leading CDOT to implement a sequence of improvement projects in coordination with FHWA. The following summarizes the sequence of completed National Environmental Policy Act (NEPA) studies and recent improvements for US 50 that have led to this *US 50 West Wills Blvd to McCulloch Blvd EA,* as shown in **Figure 1**:

- The *US 50 West Purcell Blvd to Wills Blvd EA* (CDOT, 2014) provides widening 3.4 miles of eastbound US 50 from two lanes to three lanes from Purcell Blvd to Wills Blvd to establish five lanes (three eastbound and two westbound). Safety improvements include adding northbound right turns onto US 50 at McCulloch Blvd and Purcell Blvd and establishing two water quality ponds on the east and west sides of Wild Horse Dry Creek. In addition, widening the eastbound bridge at Wild Horse Dry Creek accommodates a future pedestrian/bicycle path. Construction of these improvements is scheduled for completion in 2016.
- The *US 50 West Wills Blvd to BNSF Acceleration Lane Categorical Exclusion* (CDOT, 2015), recently approved by CDOT, establishes a westbound acceleration lane on US 50 from Wills Blvd to the BNSF right-of-way (ROW), east of the BNSF bridge, shown on **Figure 1**. Construction of the acceleration lane is scheduled for 2016.
- CDOT and FHWA are currently undertaking the *US 50 West Wills Blvd to McCulloch Blvd EA* to provide additional safety and capacity improvements to US 50. Improvements include widening 3.4 miles of westbound US 50 between Wills Blvd and Purcell Blvd, from two lanes to three lanes; and widening 2.4 miles of westbound and eastbound US 50 between Purcell Blvd and McCulloch Blvd, from two lanes to three lanes in each direction. Grade-separated interchanges would be established within the US 50 ROW at Purcell Blvd and Pueblo Blvd. A future pedestrian/bicycle path would also be accommodated between Wills Blvd and Pueblo Blvd. A regional water quality pond is proposed to treat US 50 runoff and PWMD municipal runoff.

The Proposed Action, in combination with the improvements under construction from Purcell Blvd to Wills Blvd, would establish six-lane capacity (three lanes in each direction) in the most congested portion of the PEL Corridor, between Wills Blvd and McCulloch Blvd.

For this EA, the existing features of US 50, including the improvements approved through the *US 50 West Purcell Blvd to Wills Blvd EA* (CDOT, 2014) and the *US 50 West Wills Blvd to BNSF Acceleration Lane Categorical Exclusion,* represent the No Action Alternative. The No Action Alternative assumes that no other major capacity improvements would be made to US 50. The No Action Alternative also includes routine maintenance to keep the existing transportation network in good operating condition.

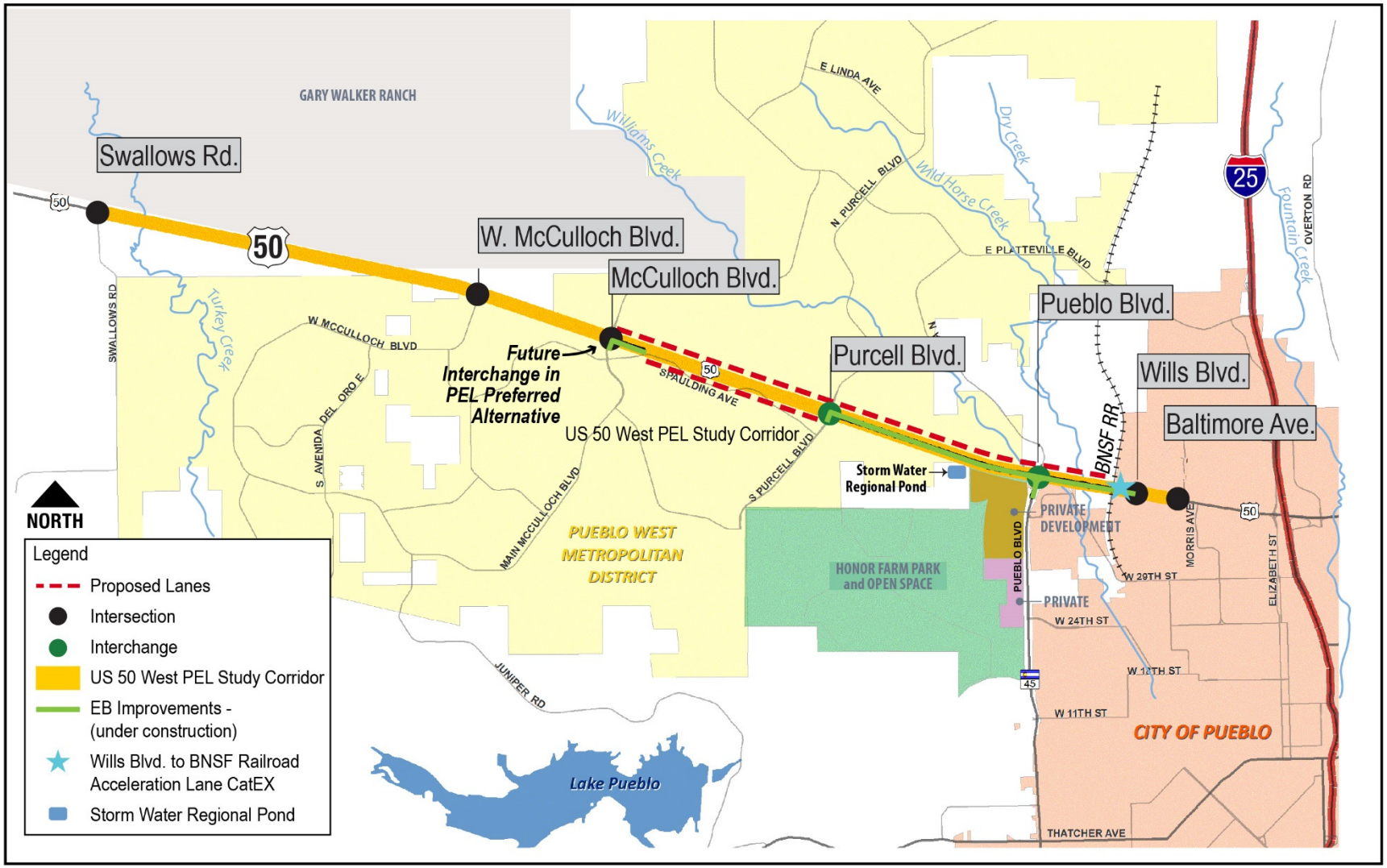
CDOT and FHWA prepared this EA to evaluate the Proposed Action benefits and environmental impacts, relevant to the No Action Alternative. This EA will also ensure that the Proposed Action would have logical termini and independent utility and would not restrict other reasonably foreseeable transportation improvements identified in the PEL recommended Preferred Alternative.

Future elements of the PEL recommended Preferred Alternative will undergo NEPA analysis as funding for design, ROW, and construction becomes available.

A water quality and floodplain assessment was conducted for the US 50 West Project in support of the EA. This technical report:

- describes the water quality and floodplains of creeks within and adjacent to the project area,
- evaluates the potential for impacts as a result of the Proposed Action and No Action Alternative, and
- identifies proposed mitigation measures.

Figure 1. Proposed Action and PEL Study Corridor



2. Project Description

2.1 Proposed Action

The Proposed Action for this *US 50 West Wills Blvd to McCulloch Blvd* EA involves widening 3.4 miles of westbound US 50 from two lanes to three lanes, to include a third westbound lane from Wills Blvd (Milepost 313.15) to Purcell Blvd (Milepost 309.78), and widening 2.4 miles of both westbound and eastbound US 50 from Purcell Blvd (Milepost 309.78) to McCulloch Blvd (Milepost 307.34). Grade-separated interchanges would be established at Pueblo Blvd and at Purcell Blvd. The Proposed Action from Wills Blvd to McCulloch Blvd, in combination with the eastbound improvements under construction from Purcell Blvd to Wills Blvd, would six-lane capacity (three lanes in each direction), for 5.8 miles of US 50, consistent with the *US 50 West PEL Implementation Plan* (CDOT, 2012b).

CDOT is proposing the following transportation improvements between Wills Blvd and McCulloch Blvd:

- **Wills Blvd Intersection to BNSF Railroad Bridge (Milepost 313.15 to Milepost 312.87) –** A third westbound lane would be established by restriping the Wills Blvd to BNSF acceleration lane (*US 50 West Wills Blvd to BNSF Acceleration Lane Categorical Exclusion*; CDOT, 2015) and by extending the westbound lane through the BNSF railroad bridge underpass to Pueblo Blvd.
- **BNSF Railroad Bridge through Pueblo Blvd Intersection (Milepost 312.87 to Milepost 312.65) –** The westbound lanes of US 50 in the vicinity of Pueblo Blvd would be realigned to be parallel to the eastbound lanes from Milepost 311.45 to Milepost 312.65, and the existing westbound bridge over Wild Horse Dry Creek would be replaced. A grade-separated interchange would be established, with Pueblo Blvd crossing over US 50. The Williams Creek concrete box culvert (CBC) under the eastbound US 50 lanes would be extended 160 ft. to accommodate the realigned westbound lanes, including the westbound third-lane widening. Pueblo Blvd would be widened to accommodate two additional left turn lanes onto westbound US 50 via a right-side exit ramp. The existing westbound US 50 lanes would be retained and modified to provide access from US 50 onto southbound Pueblo Blvd. The *US 50 West PEL Implementation Plan* (CDOT, 2012b) identifies the Proposed Action at US 50 at Pueblo Blvd to be implemented as phased improvements over time. The Proposed Action would implement a diamond-type interchange at Pueblo Blvd. The PEL recommends a Diverging Diamond Interchange configuration, which would be implemented at some time in the future when the Pueblo Blvd Extension is developed as an expressway between US 50 and I-25 (CDOT, 2012a).
- **Pueblo Blvd to Purcell Blvd Intersection (Milepost 312.65 to Milepost 309.78) –** The westbound third lane would extend from Pueblo Blvd to Purcell Blvd, and a full six-lane grade-separated interchange would be developed, with US 50 crossing over Purcell Blvd. A CBC under Purcell Blvd would be extended to accommodate a future pedestrian/bicycle trail and future widening of Purcell Blvd.

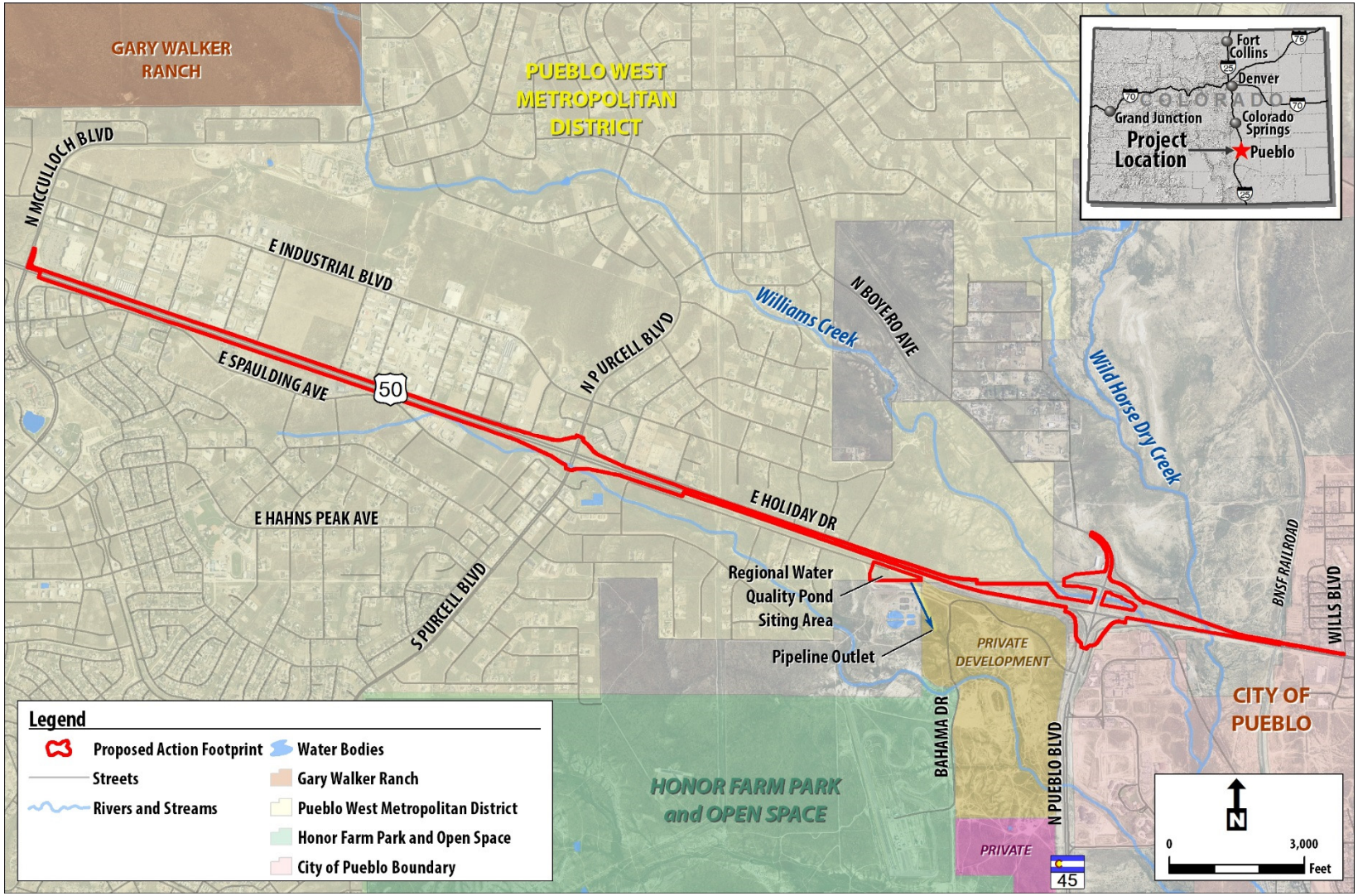
- **Purcell Blvd to McCulloch Blvd (Milepost 309.78 to Milepost 307.34) –** The Proposed Action would include a third westbound lane extending from Purcell Blvd and terminating at a right turn onto northbound McCulloch Blvd; and a third eastbound lane extending from the newly established northbound right turn from McCulloch Blvd and terminating at Purcell Blvd. The ultimate configuration for US 50 and McCulloch Blvd, although not part of this EA, is a grade-separated interchange as identified in the *US 50 West PEL Implementation Plan* (CDOT, 2012b).
- **Pedestrian/Bicycle Path –** The Proposed Action would accommodate a future pedestrian/bicycle path within CDOT ROW along the south side of US 50 from Wills Blvd to Pueblo Blvd, which is an element of the PEL recommended Preferred Alternative (CDOT, 2012a). The slope paving adjacent to the eastbound lanes at the BNSF railroad underpass would be modified to accommodate the pedestrian/bicycle path.
- **Municipal Separate Storm Sewer System (MS4) Improvements/Regional Pond –** The Proposed Action would include water quality improvements and a regional pond. Stormwater runoff for the westbound lane widening and interchange improvements between Wills Blvd and the Pueblo Blvd (Milepost 313.15 to Milepost 311.5) would be directed to the two extended detention basins (EDBs) under construction on the east and west sides of Wild Horse Dry Creek. Stormwater runoff for the westbound and eastbound lanes between Pueblo Blvd and McCulloch Blvd (Milepost 311.5 to Milepost 307.34) would be directed to a proposed regional pond site west within a private parcel of Pueblo Blvd and south of US 50.

Figure 2 provides a general map of the Proposed Action.

2.2 Action Alternative

The existing features of US 50, including the improvements approved through the *US 50 West Purcell Blvd to Wills Blvd EA* (CDOT, 2014) and the *US 50 West Wills Blvd to BNSF Acceleration Lane Categorical Exclusion*, represent the No Action Alternative. The No Action Alternative assumes that no other major capacity improvements would be made to US 50. The No Action Alternative also includes routine maintenance to keep the existing transportation network in good operating condition.

Figure 2. Proposed Action



3. Water Quality

The receiving water bodies of interest include Wild Horse Dry Creek and Williams Creek. Williams Creek flows into Wild Horse Dry Creek about 1-mile south of US 50, and Wild Horse Dry Creek flows into the Arkansas River 4 miles to the south. Wild Horse Dry Creek crosses US 50 at Milepost 312.558, and Williams Creek crosses at Milepost 312.500.

The water bodies' listed beneficial use according to the Colorado Department of Public Health and Environment (CDPHE) Regulation 32 is a user protected designation and an aquatic life warm 2, recreation E and agriculture. Impairment levels are *E. coli* at 126 colony forming units/100 milliliter and selenium (Se [ac]) at 708 micrograms per liter (µg/L).

3.1 303(d) List

The CDPHE Water Quality Control Division (Division) 303(d) list for impaired waters includes Wild Horse Dry Creek. The CDPHE water body identity for Wild Horse Dry Creek is COARMA04a (Segment 4a). The entire creek has a 303(d) high priority listing for *E. coli* and a low priority for selenium (Se). Williams Creek is COARMA04a (Segment 4d) and is not impaired.

Regulation 32 for final action provides updated "Wildhorse Creek" information effective December 31, 2013, regarding the designation and the selenium standards (which are the selenium ambient quality-based site-specific standards proposed by the PWMD during the June 2013 rulemaking hearing):

- On page 22 is the Middle Arkansas Segment 4a, "Mainstem of Wildhorse Creek from the source to the confluence with the Arkansas River," for which the Designation is Use Protected (UP) and the selenium (Se) water quality standards are Se(ac)=2376 µg/L and Se(ch)=2110 µg/L. Under "Temporary Modifications and Qualifiers," there is a note: "See assessment location at 32.6(4)." Numeric standards for other water quality parameters are listed on page 22 for Middle Arkansas Segment 4a.
- On page 11 is the 32.6(4) Assessment Criteria, "The following criteria shall be used when assessing whether a specified waterbody is in attainment of the specified standard. (a) Middle Arkansas Segment 4a, Wildhorse Creek, Se(ac)=2376, Se(ch)=2110: Selenium Assessment Location, Wildhorse Creek above Pesthouse Gulch: 38.296478, -104.649201"
- On pages 63 and 64 is the Statement of Basis and Purpose language for the Mainstem of Wildhorse Creek (Middle Arkansas Segment 4a) regarding the Water Quality Control Commission's revision of the selenium ambient quality-based site-specific standards.

Regulation 32 for final action also provides "Williams Creek" information regarding the designation and the selenium standard:

- On page 22 is the Middle Arkansas Segment 4d "All tributaries, including wetlands, to the Arkansas River and Pueblo Reservoir from the inlet to Pueblo Reservoir to the Colorado Canal headgate, except for specific listings in the Fountain Creek Subbasin and in segments 4a, 4b, 4c and 4e through 18b," for which the Designation is Use Protected (UP) and the selenium (Se) water quality standard is Se(ch)=20(Trec). Numeric standards for other water quality parameters are listed on page 22 for Middle Arkansas Segment 4d.

The source of selenium is suspected to be related to natural background conditions from shale outcrops within the watershed. Selenium and *E. coli* are not associated with highway operations and are not considered to be an environmental issue for this project. Nevertheless, this roadway project will provide treatment for roadway runoff that extends above and beyond the minimum requirements of providing the water quality capture volume (WQCV) for the added pavement areas. These additional treatments will include additional WQCV for existing tributary pavement and providing flat swales adjacent to the road shoulders to allow sediment to settle out. Other water quality improvements not currently provided will include adding riprap erosion protection at culvert ends and around bridge abutments and piers.

4. Issues

Potential construction phase issues include sediment or pollutants running off exposed areas or paved areas and entering a waterway, tributary culverts and swales, or private property. Post-construction issues include pollutants being washed off paved surfaces and eventually entering waterways or adjacent properties. Increased pavement will also increase the amount of surface runoff.

5. Methods

Based on CDOT's *Water Quality Model Program Decision Tree and Evaluation Handbook* (February 2013), it was determined that no modeling was necessary for this project. Data uses included checking the CDPHE 303(d) list of impaired waters database. The 303(d) lists Wild Horse Dry Creek as having a high priority for *E. coli* and a low priority for selenium (Se), neither of which are pollutants associated with transportation projects or pavement. The proposed permanent water quality facilities identified in the Proposed Action include flat swales adjacent to the roadway and two EDB water quality ponds. The swales and EDBs will attenuate flows, allow infiltration and evapo-transpiration, and treat biological uptake. This technical report involved no sampling or analysis.

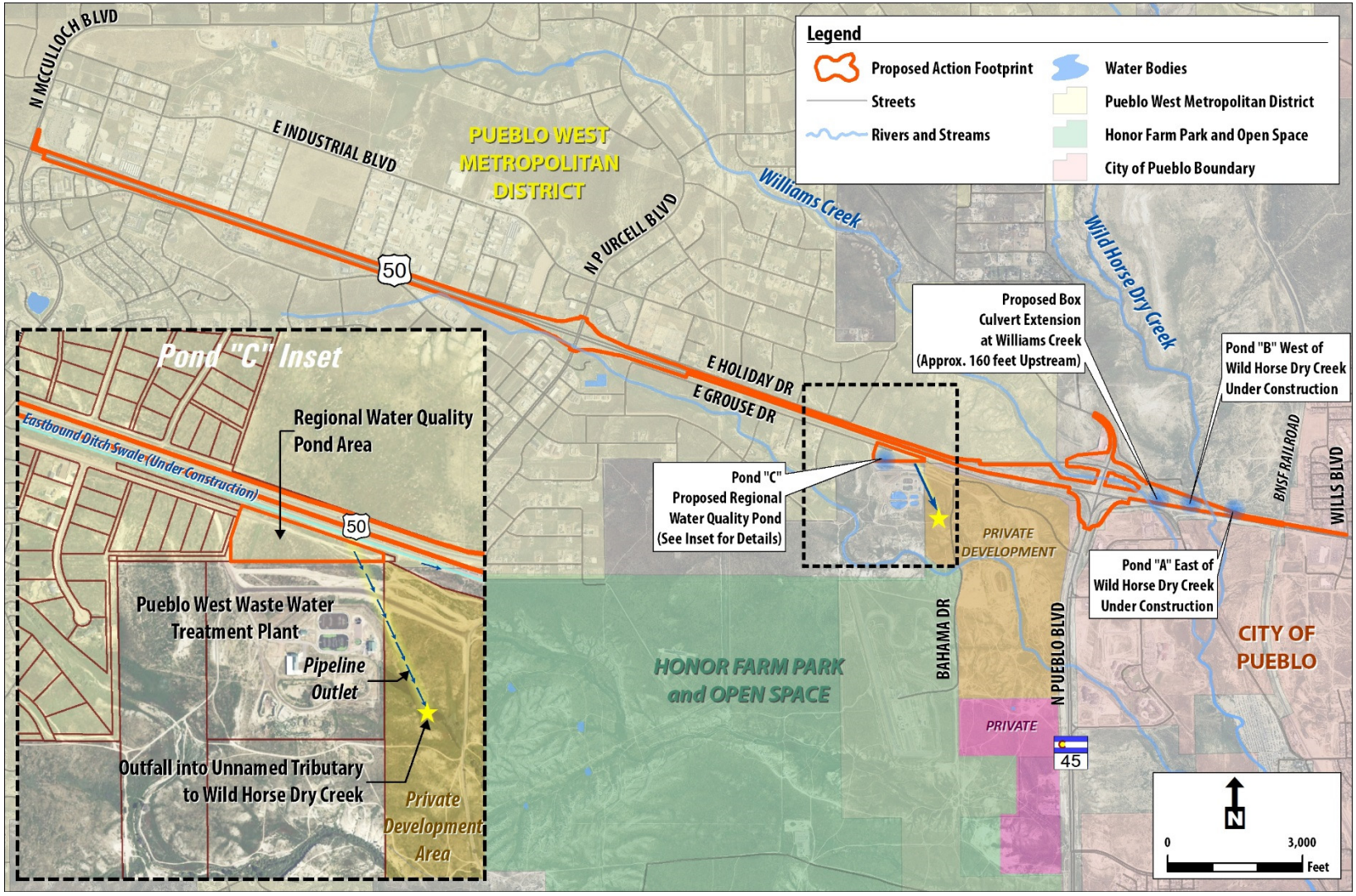
6. Impact Summary

Permanent impacts on water quality in Wild Horse Dry Creek and Williams Creek will be mitigated with a combination of project improvements, including improved flat native grass lined swales adjacent to the roadway, use of two EDB Ponds A and B under construction at Wild Horse Dry Creek, and development of a regional Pond C, as shown on **Figure 3**.

- **Wills Blvd and Pueblo Blvd (Milepost 313.15 to Milepost 311.5) –** Stormwater runoff for the westbound acceleration lane, third westbound lane widening, and interchange improvements between Wills Blvd and Pueblo Blvd will be directed to the EDBs under construction on the east side (Pond A) and west side (Pond B) of Wild Horse Dry Creek. For the urban section of US 50 from Wills Blvd to BNSF (Milepost 313.15 to Milepost 312.87), water quality improvements include curb and gutter and stormwater pipe and inlets that will connect with the recently installed stormwater pipe on the south side of US 50. Flows will be carried to Pond A on the east side of Wild Horse Dry Creek (*US 50 West Wills Blvd to BNSF Acceleration Lane Categorical Exclusion* (CDOT, 2015).
- **Pueblo Blvd and McCulloch Blvd (Milepost 311.5 to Milepost 307) –** Stormwater runoff for the proposed westbound lane between Pueblo Blvd and Purcell Blvd, and the proposed westbound and eastbound lanes between Purcell Blvd and McCulloch Blvd will be directed to a proposed regional pond site (Pond C) west of Pueblo Blvd through a system of flat native grass lined swales adjacent to US 50. Cross culvert drainage pipes under US 50 will connect proposed eastbound and westbound swales. **Appendix A** provides additional detail about the regional pond.

These modifications will treat new pavement plus existing pavement. Currently, there is no water quality treatment for the roadway runoff. This project, in combination with the US 50 eastbound improvements, will improve the water quality of stormwater runoff. Temporary construction impacts will include working adjacent to drainageways. Impacts on drainageways can occur during bridge construction, storm drainage construction, removal of invasive plant species (tamarisk and noxious weeds), or grading operations. It is planned to have construction best management practices (BMPs) adjacent to drainageway areas to prevent erosion in adjacent construction zones and deposition of sediment.

Figure 3. Water Quality Improvements



7. Mitigation Strategies

The following are preliminary strategies for mitigation of impacts and are subject to change. The National Environmental Policy Act decision document will define final mitigation measures. The project will closely follow the existing horizontal and vertical alignment of eastbound US 50 to minimize impacts. The new bridge at Wild Horse Dry Creek will be of similar length and location, and grading below the bridge is planned to minimize impacts to the waters of the US and avoid wetlands.

The two water quality ponds currently under construction will pass treated stormwaters to Wild Horse Dry Creek via culverts, with end sections and riprap erosion protection. The proposed regional pond will pass treated stormwaters to a tributary of Wild Horse Dry Creek via a pipeline with end sections and riprap erosion protection. A preliminary bridge hydraulics analysis for US 50 over Wild Horse Dry Creek was performed. Results indicate that the proposed bridge, with minor channel improvements, will produce a minor-rise in the 100-year regulatory base flood elevation (BFE). During construction, impacts will be minimized. Final design plans will include a detailed Stormwater Management Plan (SWMP) and a set of erosion and sediment control plans. This set of plans will guide the contractor and CDOT construction management forces during construction. It will be a living document that can be modified or revised in the field during construction to address any unforeseen erosion or sedimentation problems. BMPs anticipated to be used for this project may include:

- Sweeping with a pick-up broom
- Erosion logs
- Aggregate bags
- Check dams
- Silt fence
- Concrete washout structures
- Storm drain inlet protection
- Stabilized construction entrances
- Removal and disposal of sediment
- Temporary berms
- Native seeding and mulching
- Placement of soil retention blankets
- Placement of plastic fence to protect sensitive areas
- No debris from demolition (bridges, etc.) allowed in waterways
- Use of clean water diversions during stream work

An erosion control supervisor will be present at the construction site to ensure that erosion control is provided throughout the construction period and that the SWMP is implemented. Erosion control devices will be added, repaired, modified, and maintained as required to limit erosion and sedimentation within the project site.

CDOT's MS4 requires either 100 percent WQCV or 80 percent total suspended solids (TSS) removal for new impervious areas in a project area. The permanent water quality facilities for this project will provide 100 percent WQCV for the new paved areas within the project area. This conforms to CDOT's MS4 requirements.

The mitigation strategy for permanent water quality includes three EDBs: (1) Pond A (under construction) west of Wild Horse Dry Creek; (2) Pond B (under construction) east of Wild Horse Dry Creek; and (3) Pond C regional pond near a tributary to Wild Horse Dry Creek. These ponds will have fore-bays and micro-pools and provide the required water quality capture volumes for their

tributary areas. Each pond will have an outlet structure designed for a 40-hour drain time. The fore-bays will be located where the storm sewers empty into the ponds. They are designed to drain within 5 minutes and intercept the large floatable debris. Access to each facility will be from US 50 or other CDOT right-of-way (ROW) locations. A 10-foot-wide aggregate base course maintenance path at a maximum 10:1 slope will provide direct access to the basins and outlet works. The design objective for this project is to provide the water quality capture volume for all of the paved surfaces (new and existing) within the tributary basins to each pond. The EDB type of permanent water quality treatment conforms with the CDOT Region 2 MS4 program because it:

- Fits within the current CDOT ROW, or property planned for acquisition by CDOT, as well as use of PWMD multiple use easements adjacent to CDOT ROW)
- Can achieve the required water quality capture volume
- Can be accessed for maintenance
- Is the type of facility that CDOT has approved

Expected pollutant removal rates for facilities that capture the water quality capture volume are between 80 and 90 percent of TSS. No existing water quality facilities in the project area will necessitate abandonment or reconfiguration. All water quality facilities will pass treated stormwaters to Williams Creek or Wild Horse Dry Creek within the ROW. **Table 1** summarizes the impervious area that would be treated by the proposed water quality ponds.

Table 1. Summary Water Quality Facility at Wild Horse Dry Creek

ID	Description	Required Impervious Area to Be Treated (acre)	Actual Impervious Area Treated (acre)	Comments
Pond A	US 50 Basin East of Wild Horse Dry Creek (Milepost 312.5 to Milepost 311.5)	5.34	5.34	Water quality needs fulfilled
Pond B	US 50 Basins West of Wild Horse Dry Creek (Pueblo Blvd Interchange) (Milepost 312.5 to Milepost 313.15)	12.37	12.37	Water quality needs fulfilled
Pond C	US 50 Basins West of Wild Horse Dry Creek (Milepost 311.5 to Milepost 307.34)	21.85	21.85	Water quality needs fulfilled
Totals		**39.56**	**39.56**	**All water quality needs fulfilled and MS4 obligations met**

CDOT forces will complete the anticipated maintenance work required to ensure continued effectiveness of the facility, which will include:

- Conducting regular inspections.
- Mowing the native grass in the water quality basin and removing vegetation that may clog the outlet structure.
- Cleaning trash and debris off the trash rack and grates and appropriately disposing of material off-site.
- Clearing orifice holes so that water can continue to flow.
- Removing sediment from the basin when levels reach the lowest hole or the fore-bay outlet pipe is blocked. This can be done with a hand shovel, bob-cat, or skid-steer. Removing the material off-site prevents repolluting the pond.
- Reseeding as necessary to prevent erosion.
- Adding additional erosion control items as needed to stabilize the site.
- Tightening or replacing trash rack bolts and screens as necessary to keep the structure in working order.

8. Floodplains

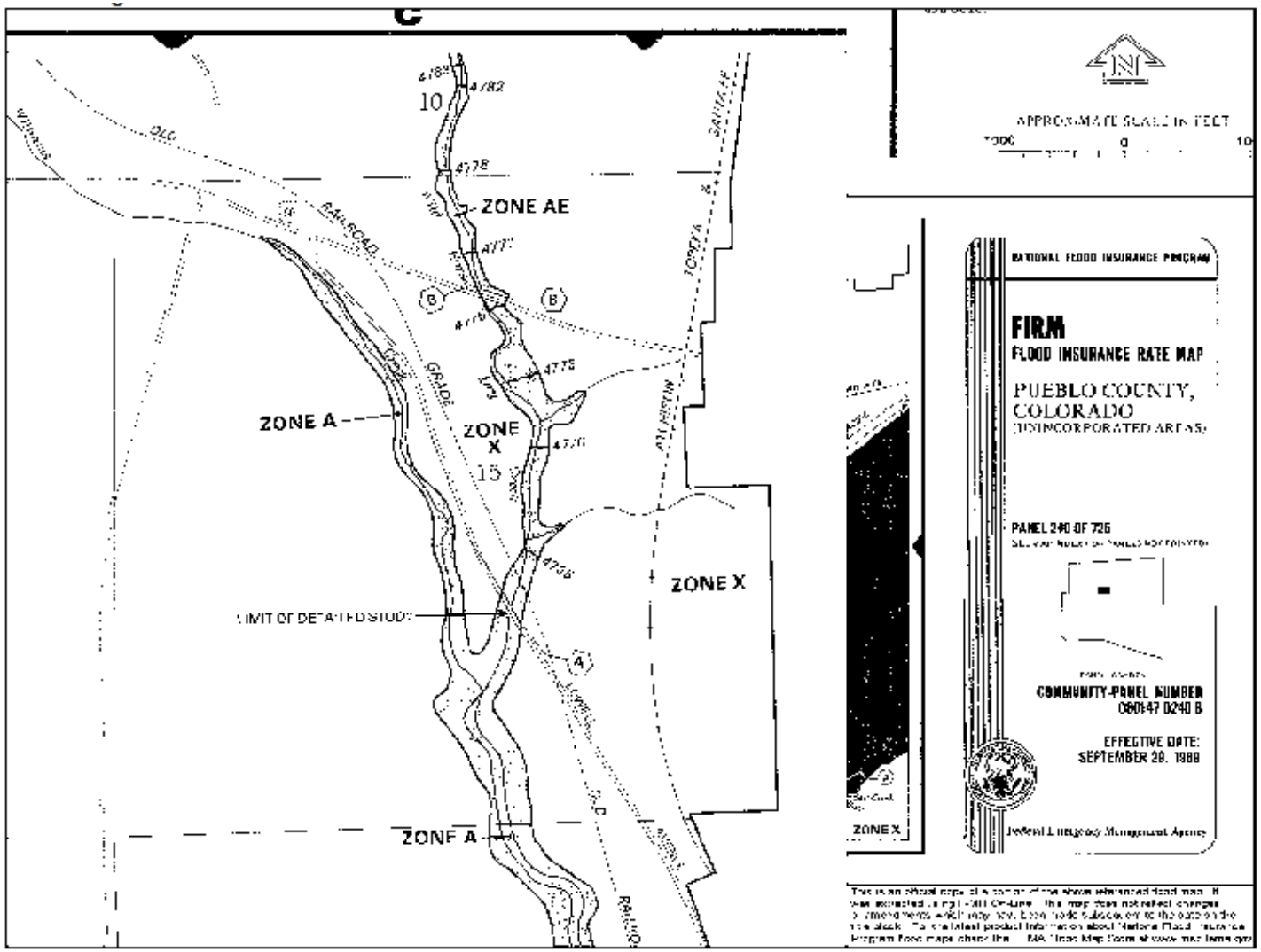
US 50 crosses two Federal Emergency Management Agency (FEMA)-regulated floodplains in the project area, Williams Creek and Wild Horse Dry Creek, as shown on **Figure 4,** FEMA FIRM, Flood Insurance Rate Map (FIRM) No. 0801470240B, effective September 29, 1989. Williams Creek is currently designated as a Zone "A" floodplain, and Wild Horse Dry Creek is designated as a Zone "AE" floodplain. No floodway is delineated for either floodplain.

Zone "A" designates areas that are subject to inundation by the 1-percent-annual-chance (100-yr) flood event as determined by approximate methods. No BFEs have been established. Zone "AE" designates areas that are subjected to inundation by the 100-yr flood event as determined by detailed methods. BFEs are provided for "AE" Zones. A regulatory floodway indicates the area of a channel or river and adjacent land areas that must be reserved to discharge the base flood without cumulatively increasing the water surface elevations more than a designated height. The FIRM and Flood Insurance Study for Pueblo County both have an effective date of September 29, 1989, and no Letters of Map Revision (LOMR) have been completed in this area for either creek. It does not appear that the eastbound lanes of US 50 were modeled and incorporated into the current FEMA mapping.

Work in both of these floodplains will require a Floodplain Development Permit from Pueblo County. A conditional letter of map revision (CLOMR) from FEMA is required for projects where the proposed changes produce a rise in the water surface elevation (WSE) of more than 1.0 feet in the floodplain or more than 0.0 feet in the floodway. Pueblo County has adopted stricter standards and may require a CLOMR when a rise in the water surface elevation is more than 0.5 feet in the floodplain, according to the Pueblo County Code Title 17, Chapter 17.108.

Neither creek has a floodway delineated; however, FEMA is currently reviewing a Flood Hazard Area Delineation (FHAD) study done by Anderson Consulting Engineers, Inc. This FHAD would delineate a floodway for both Williams Creek and Wild Horse Dry Creek. This FHAD also revises the hydrology for Wild Horse Dry Creek and decreases the 100-yr flows significantly. It is currently unknown when this study will be accepted by FEMA and become effective, but this project will coordinate with Anderson to check the proposed improvements against the FHAD.

Figure 4. FEMA FIRM



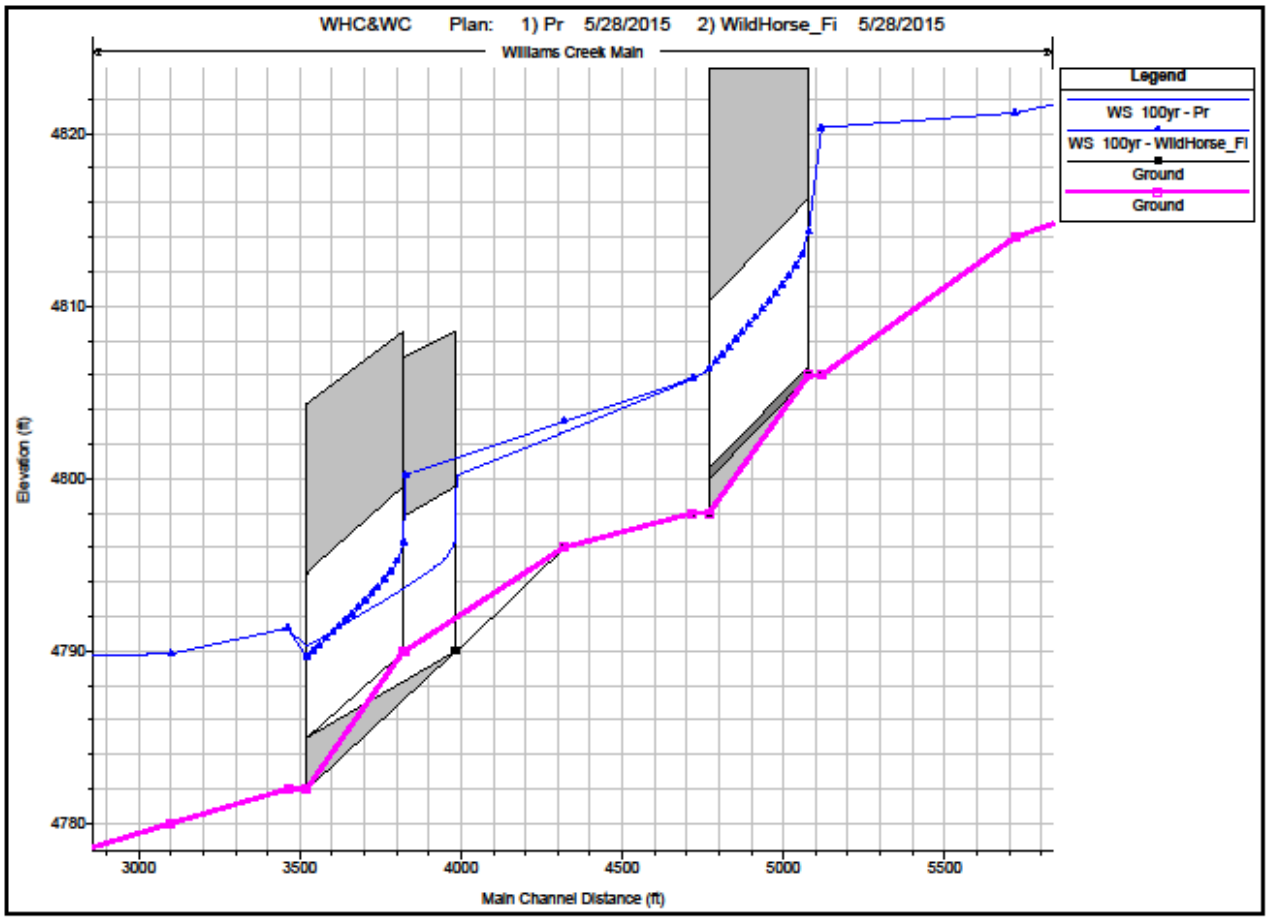
8.1 Proposed Floodplain Impacts

8.1.1 Williams Creek

Williams Creek currently passes under eastbound US 50 through a double 9' x 10' x 322' CBC with a tapered inlet condition with a 3:1 drop over 15 feet as well as 15-foot inlet opening that tapers to 9 feet over a length of 26 feet. This CBC will be extended approximately 160 feet to accommodate the realignment of westbound US 50 to be parallel to eastbound US 50, as shown in **Figure 3**. The main 9' x 10' culvert will be extended under the new westbound lanes, and the improved inlet condition will be reconstructed at the new upstream end of the culvert. The CBC extension lines up well with the existing channel of Williams Creek and will not require significant channel grading. A long wing wall on the west side of the CBC will retain the roadway embankment and provide room to do some minor channel grading on the west bank of Williams Creek to provide a smooth transition into the extended CBC.

Preliminary analysis using HEC-RAS shows that the CBC extension is expected to cause a drop in the water surface elevation of approximately 0.6 feet upstream of the CBC and a rise of approximately 0.6 feet at the downstream face of the CBC (see **Figure 5**). This rise ties back into the existing water surface elevations within 60 feet downstream of the culvert and is a localized condition that is contained to the channel and CDOT ROW. This rise will be investigated during subsequent design to determine if it can be mitigated to a maximum of 0.5-foot rise. Modeling options will be investigated to ensure that the improved inlet condition is being represented accurately in the HEC-RAS model because HEC-RAS does not have the capabilities to model a culvert that changes shape. Based off the FHAD model received from Anderson Engineering, a double 12.5' x 9.5' CBC was modeled to represent the 9' x 10' CBC with improved inlet. Anderson's assumptions will be confirmed during subsequent design.

Figure 5. Williams Creek Profile Comparison

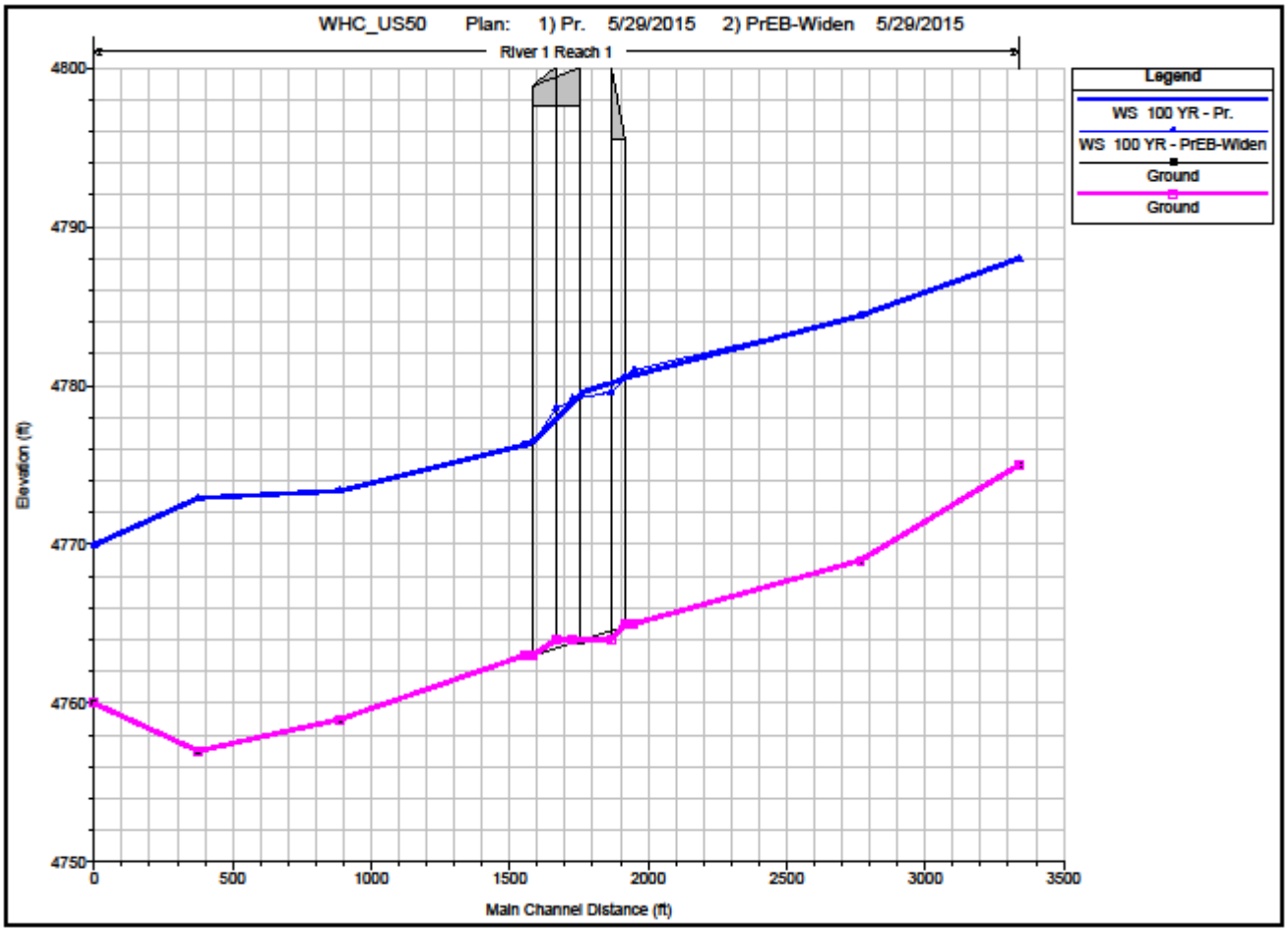


8.1.2 Wild Horse Dry Creek

Wild Horse Dry Creek currently passes under westbound US 50 through a three-span 186-foot-long and 44.5-foot-wide bridge at approximately a 45-degree skew to the channel. The existing eastbound US 50 bridge is a three-span 208-foot and 44.5-foot-wide bridge that is currently under construction to be widened to approximately 74 feet. This bridge has an approximately 60-degree skew to the channel. In the current condition, the westbound lanes of US 50 are approximately 140 feet north of the eastbound lanes and the two lanes are not parallel. Westbound US 50 will be realigned to be parallel and closer to eastbound US 50. This requires a new bridge to carry the westbound lanes over Wild Horse Creek. The new crossing will consist of a three-span bridge, with span lengths, skew, and channel cross-section matching closely to the eastbound structure to maintain hydraulic efficiency. The two bridges were modeled as one wide bridge (approximately 174 feet) in HEC-RAS because this is effectively what the channel will see when the westbound bridge is built. Because the two bridges are skewed to the channel, the creek sees a slightly wider bridge than what is actually proposed.

Preliminary analysis using HEC-RAS shows that the new westbound US 50 bridge and removal of the existing westbound US 50 bridge is expected to cause a drop in the WSE of approximately 0.9 feet under the proposed bridge and a rise of approximately 0.6 feet near the downstream face of the existing westbound US 50 bridge (see **Figure 6**). More refinement is needed to the model to show changes to the channel from removing the bridge, and additional channel grading can be proposed to determine if the 0.6-foot rise can be mitigated. This localized rise is contained within the channel of Wild Horse Creek and CDOT ROW.

Figure 6. Wild Horse Dry Creek Profile Comparison



9. Floodplain Mitigation

Mitigation efforts will be investigated as part of final design to minimize impacts to the floodplains. At Wild Horse Dry Creek, it is likely that minor channel grading will minimize the rise in the WSE to 0.5 feet or less. At Williams Creek, mitigation to lower the rise in the WSE is less feasible, however, this rise is contained in the main channel, only impacts CDOT ROW, and will not impact any insurable structures. Preliminary discussions with CDOT and Pueblo County have indicated that a CLOMR may not be required even with a 0.6-foot rise because of the reasons listed above.

10. Agency Coordination

Agencies that were coordinated with include the City of Pueblo, Pueblo County, and PWMD.

11. CDOT Coordination

CDOT coordination for this project included Region 2 design, hydraulics, environmental, and maintenance staff.

12. Permits

Wetlands exist near the low areas for Wild Horse Dry Creek and Williams Creek. The anticipated impacts on these wetlands are included in the project footprint (see **Figure 2** and *Appendix A07, Wetland Delineation Technical Report* of this EA). As the design progresses toward final completion, impacts will be more accurately established. Currently, it is anticipated that an Army Corps of Engineers Section 404 permit will be necessary.

The consultant will prepare a CDPHE Colorado Discharge Permit System (CDPS) Permit. This permit will be prepared in conjunction with a set of erosion control plans that address erosion and sedimentation during construction. These plans will be prepared as a part of the final design. This permit will be transferred to the contractor at CDOT's discretion.

Groundwater depths within the project area are deep, and the storm drain lines and water quality ponds are not anticipated to penetrate it. Caissons for bridge improvements will likely encounter shallow groundwater in proximity to Wild Horse Dry Creek and will require a dewatering permit. The contractor will be required to obtain any necessary dewatering permits. Project specifications will outline any required dewatering permits during final design.

A floodplain use permit will be obtained from Pueblo County. This permit will be prepared during the final design in conjunction with CDOT. In summary, the CDPS Permit and the floodplain permit(s) will be obtained by CDOT and transferred to the contractor at CDOT's discretion. The contractor will apply for a dewatering permit if deemed necessary.

13. References

Colorado Department of Transportation (CDOT). 2004a. *Drainage Design Manual.*

—. 2004b. MS4 Permit. New and Redevelopment Stormwater Management Program. February.

—. 2012a. *US 50 West Planning and Environmental Linkages (PEL) Study*. June.

—. 2012b. *US 50 West PEL Implementation Plan*. June.

—. 2013. *Water Quality Model Program Decision Tree and Evaluation Handbook*. February.

—. 2014. *US 50 West Purcell Blvd to Wills Blvd Environmental Assessment*. June.

—. 2015. *US 50 West Wills Blvd to BNSF Acceleration Lane Categorical Exclusion*. October.

Colorado Department of Public Health and Environment (CDPHE). Regulation No. 93, 2004 Section 303d List, Water-Quality-Limited Segments Requiring TMDLs. 2004. http://www.cdphe.state.co.us/regulations/wqccregs/index.html. http://www.cdphe.state.co.us/op/wqcc/Standards/RegsCurrent/RegsCurrent.html.

—. 2013a. Stream Classifications and Water Quality Standards.

—. 2013b. Regulation No. 31.

Felsburg Holt & Ullevig (FHU). 2013a. Progress meetings with staff from CDOT, JF Sato and Associates, and Pueblo West Metro District. Various dates.

—. 2013b. FHU site visits.

Urban Drainage and Flood Control District. 2011. *Urban Storm Drainage Criteria Manual*, Volumes I, II, and III.

Appendix A
Regional Water Quality Pond

Introduction

Colorado Department of Transportation (CDOT) determined that a regional water quality pond would be a strategic addition to the United States Highway 50 (US 50) Planning and Environmental Linkages (PEL) Corridor. The proposed regional pond (Pond C) would establish Municipal Separate Storm Water System (MS4) compliance for stormwater runoff for the proposed US 50 improvements from McCulloch Blvd (Milepost 307.34) to west of Pueblo Blvd (Milepost 311.5). Runoff between Wills Blvd and Pueblo Blvd (Milepost 313.15 to Milepost 311.5) would be directed to the two extended detention basins under construction on the east (Pond A) and west (Pond B) sides of Wild Horse Dry Creek. CDOT coordinated with the Pueblo West Metropolitan District (PWMD) and the City of Pueblo to establish a regional pond concept and site that could become a shared facility with PWMD and that could be compatible with the ongoing master drainage planning studies.

The PWMD *Stormwater Master Basin Planning Study – Phase 3* (NorthStar, 2013) is a master plan for stormwater discharges associated with a MS4 for PWMD to reach compliance with the Colorado Department of Public Health and Environment (CDPHE) Water Quality Control Division (WQCD) stormwater regulations under Phase II of the National Pollutant Discharge Elimination System (NPDES) requirements. The Master Plan specifically addresses milestone goals related to the planning, operation, maintenance, and construction of storm drainage facilities in PWMD. The PWMD *Stormwater Master Basin Planning Study* incorporates criteria found in the *Storm Drainage Design Criteria and Drainage Policies*, City of Pueblo, 1997.

The PWMD NPDES program requires that water quality measures be implemented for newly developed areas and substantial redevelopments. Basins that are already fully developed will not require water quality improvements; however, water quality improvements will be incorporated in fully developed basins to the extent that the improvements are practical. Regional implementation of stormwater detention was explored as a part of the PWMD Master Plan and was characterized as "publicly owned and maintained facilities that have the best chance of operating effectively over the long-term and are able to be accounted for in the determination of downstream design flow rates."

Regional Pond Siting Coordination

CDOT's MS4 planning for the US 50 PEL Corridor overlaps with the PWMD and City of Pueblo basin planning studies. CDOT met with PWMD on December 10, 2015, and with the City of Pueblo on December 16, 2015, to discuss the regional pond concept and to review the proposed site area on the south side of US 50 (near Milepost 311.4).

CDOT initially identified the land adjacent to the Pueblo West Waste Water Treatment Plant as a potential siting area for Pond C, as this area would generally meet the following regional pond siting criteria:

- A location west of the Pueblo Blvd intersection (Milepost 311.5)
- An approximately 4-acre site in close proximity to US 50 ROW and the eastbound drainage swale (under construction)
- Proximity to an unnamed tributary for discharging the treated water, which would ultimately flow into Wild Horse Dry Creek
- Compatibility with PWMD and City of Pueblo land use plans and regulations
- Compatibility with master basin plans for Williams Creek and Wild Horse Dry Creek
- Opportunities for establishing a shared MS4 water quality detention pond with PWMD

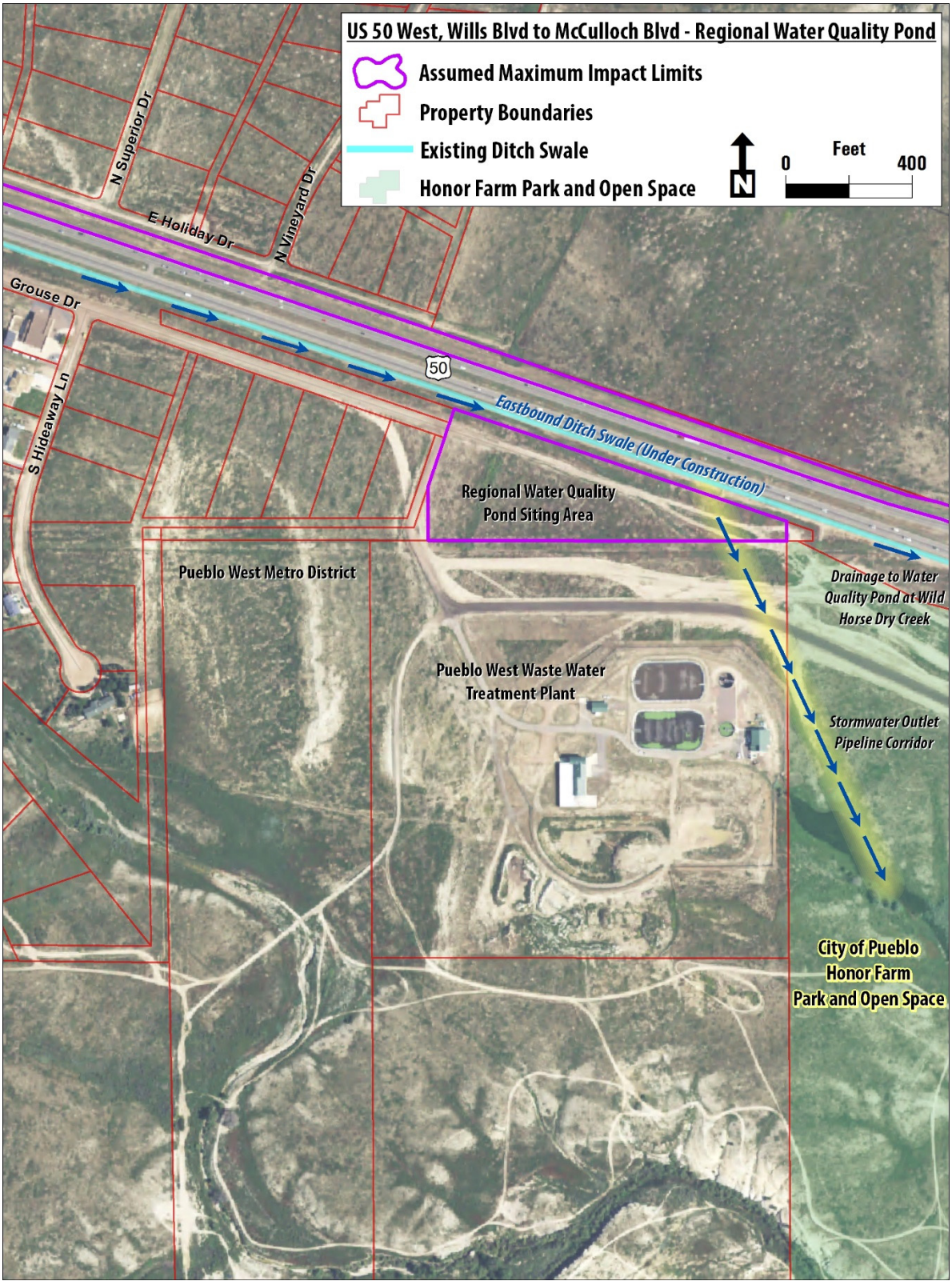
PWMD plans to enlarge the treatment plant and construct a pipeline to convey the treated water directly from the treatment plant to the Arkansas River, as shown in **Figure A- 1**. Due to PWMD's plans to expand the treatment plant, the most suitable location for the US 50 regional Pond C would be on a private parcel directly north of the plant and adjacent to the US 50 ROW. CDOT would direct the treated water from Pond C through a pipeline connecting the pond to the unnamed tributary of Wild Horse Dry Creek. The pipeline corridor would cross the City of Pueblo Honor Farm Park and Open Space, as shown on **Figure A- 2**.

CDOT would acquire the private parcel shown on **Figure A- 2** and construct, operate, and maintain the regional pond facility in compliance with the conditions outlined in the Honor Farm Park and Open Space Conservation Deed, in coordination with the City of Pueblo. Initial discussions with the City of Pueblo indicate the proposed concept for the regional pond would be allowable within the Honor Farm Park and Open Space and would be a positive contribution to the basin stormwater planning within the basin area (See *Appendix A12, Parks and Recreation Resources Technical Report* of this EA).

The Williams Creek watershed has a drainage area of 14.6 square miles, and the Wild Horse Creek watershed has a drainage area of 31.4 square miles. None of the regional detention ponds identified in the City's plan have been constructed. There are facilities in the upper reaches of Wild Horse Creek and Williams Creek that are identified, as well as two sites on the City's Honor Farm property, and sites closer to the confluence with the Arkansas River. But, to date, they have not been constructed. **Figure 3** shows the location of US 50 ponds A, B, and C within the watershed areas.

Figure A- 1. Pueblo West Wastewater Treatment Plant Site

Figure A– 2. Regional Pond Site



Environmental Reviews

The Proposed Action for US 50 MS4 compliance through the implementation of US 50 ponds A, B and C would positively affect the capacity and timing of the detention ponds identified in the City's plan for Williams Creek and Wild Horse Dry Creek, downstream of US 50; and the concept of a shared regional water quality pond would contribute to PWMD's stormwater management. The pipeline outlet from the regional pond to the unnamed tributary would cross the Honor Farm Park and Open Space in a manner that is in compliance with the Conservation Easement Deed.

Evaluations of the regional pond project area indicate that there would be no impacts to historic resources, archaeological resources, paleontological resources, federally listed threatened and endangered species, or hazmat sites.

The siting process considered alternatives for the regional pond site; however, for CDOT to meet the criteria for establishing a functional MS4 facility for US 50, the Honor Farm Park and Open Space would be unavoidable. Due to the proposed underground pipeline and conformance with consistent uses within the Conservation Easement Deed, FHWA is considering making a *de minimis* finding in accordance with Section 4(f) (See *Appendix A12, Parks and Recreation Resources Technical Report* of this EA).

Next Steps

As funding becomes available to design and implement the regional pond, all required environmental permitting and NEPA compliance will be conducted.

References

City of Pueblo. 2001. Deed of Conservation Easement, Honor Farm Park and Open Space. June 29.

—. 2007. Honor Farm Park and Open Space Master Plan.

—. 2013. *Pueblo West Stormwater Master Basin Planning Study – Phase 3*. NorthStar.

Communications with City of Pueblo. December 2015. See **Appendix B** of the EA.

Communications with Pueblo West Metropolitan District. December 2015. See **Appendix B** of the EA.