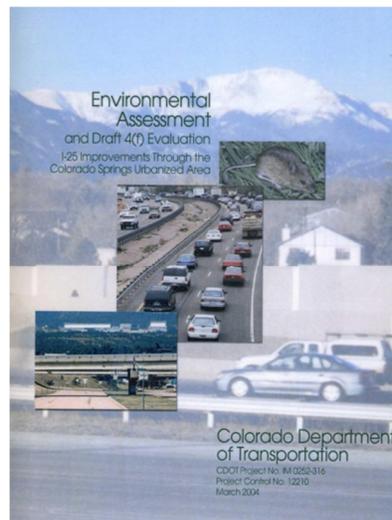




RE-EVALUATION, Mileposts 149 to 161

Interstate 25 Improvements through the Colorado Springs Area Environmental Assessment



WATER QUALITY TECHNICAL MEMO

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CDOT Region 2

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Introduction

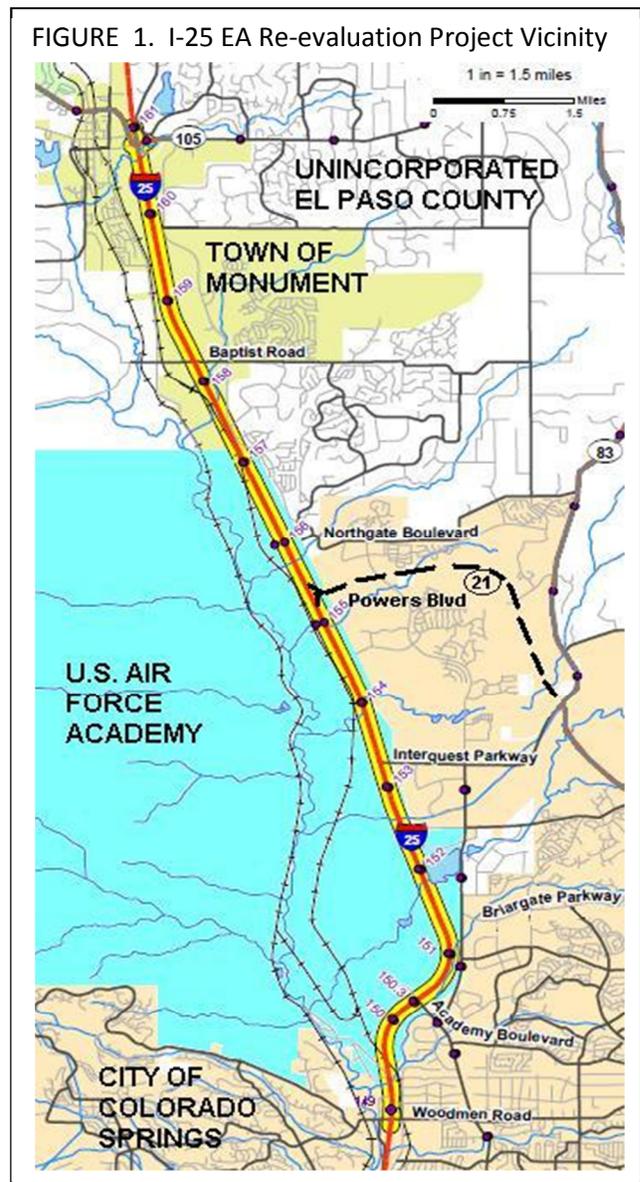
The Colorado Department of Transportation (CDOT) has prepared this technical memorandum to update findings on Water Quality described in the original 2004 I-25 Environmental Assessment (EA) with regard to the portion of the Proposed Action between Woodmen Road (Exit 149) in Colorado Springs and State Highway 105 in Monument (Exit 161). The proposed action is to relieve existing traffic congestion and address project future congestion on I-25 within the Colorado Springs urbanized area.

The I-25 EA originally evaluated impacts for the widening of I-25 between South Academy Boulevard (Exit 135) and SH 105, together with reconstruction of various I-25 interchanges within this corridor. Page 2-10 of the EA stated that, “Consistent with projected traffic demand in the I-25 corridor, the conceptual phasing for the Proposed Action calls for:

- (1) initially six-laning through central Colorado Springs, then
- (2) six-laning in northern El Paso County, and finally
- (3) adding HOV [High-Occupancy Vehicle] lanes through central Colorado Springs and widening to six lanes south to South Academy Boulevard.”

The first of these conceptual phases was undertaken in central Colorado Springs, completed in 2007. The so-called COSMIX project resulted in 12 miles of six-lane freeway, between South Circle Drive (Exit 138) and North Academy Boulevard (Exit 150). It included major reconstruction at several interchanges, notably not including the Cimarron Street interchange (Exit 141) or the Fillmore Street interchange (Exit 145). Additional funding will be needed to complete Phase 1.

For the year 2012, CDOT has received funding to begin the second phase, meaning to widen I-25 to six lanes in northern El Paso County, within the area shown in Figure 1. The EA calls for eventually widening I-25 all the way to SH105. Total funding for this project is yet to be determined. Currently enough is available to widen I-25 from Woodmen Rd to Interquest (Exit 153). Nevertheless, to be prepared for possible additional funding being available to complete the widening to SH 105 with this project or available in the near future, CDOT's current EA re-evaluation effort is covering all Phase 2 improvements. Therefore, the study area for this re-evaluation extends northward all the way to Monument.



The I-25 EA included a new connection with Powers Boulevard (now State Highway 21), following SH21 eastward to just past the Powers Boulevard/Voyager Boulevard interchange. The design and analysis of this connection in the I-25 EA superseded what was proposed earlier in the North Powers Boulevard EA that was approved in 1999. The current EA re-evaluation also includes this portion of Powers Boulevard from I-25 to just east of Voyager Parkway.

Summary of the 2004 EA Water Quality Impacts and Mitigation

The I-25 EA and FONSI were approved in 2004, several years after CDOT received its first Municipal Separate Stormwater System (MS4) permit on January 15, 2001. The EA indicated that appropriate temporary and permanent mitigation measures would be identified during project design.

Throughout northern El Paso County, where 2012 widening will take place, stormwater from I-25 flows westward (down gradient) to nearby Monument Creek or its tributaries. Figure 2 on page 3 shows I-25 and nearby significant watercourses through the project area. Monument Creek in northern El Paso County is referred to as Fountain Creek Segment 6 by the Colorado Department of Health and Environment (CDPHE).

The EA indicated that Fountain Creek Segment 6 was not on the Colorado September 10, 2002 303(D) List of Impaired Waters that identified water bodies for which the Water Quality Control Division determined that one or more assigned uses or standards were not currently attained. The EA included Table 1, "Stream Classification and Water Quality Standards". The classification and standards for Fountain Creek Segment 6 (Monument Creek) as of April 2002, as presented in the EA, are shown below. The current (2012) classifications and standards are presented later in this memo, with a brief comparison of the past and current situation

The EA identified baseline water quality conditions and used the Driscoll method and other methodologies to estimate the increase in the annual load of pollutants from I-25 with the Proposed Action and future increases in traffic loads. The EA recommended that Best Management Practices (BMPs) with significant removal rates for metal constituents (especially lead, copper and zinc) be implemented to mitigate negative impacts from increased traffic on the highway.

The EA indicated that without mitigation, widening I-25 would increase runoff and associated pollutant loading due to a nearly two-fold increase in impervious area. However, by incorporating highway drainage improvements and permanent best management practices to capture and to treat stormwater run-off as required by CDOT's New Development and Redevelopment Program standards (CDOT, 2004), the quality of highway runoff discharged to downstream receiving waters was expected to improve from the existing condition. At the time that the EA was written, CDOT's New Development and Redevelopment Program was not yet implemented.

The EA indicated that the main effect of highway construction activities on water quality would be an increase of pollutants in runoff due to erosion. The EA also discussed existing issues with stream bank erosion and channel bed degradation throughout the Fountain Creek watershed due to increased runoff from development. The EA indicated that every effort should be made to minimize both temporary and permanent impacts to water quality. The EA listed several BMPs to be employed in an effort to minimize both short term and permanent impacts to water bodies as a result of construction of the proposed project. CDOT's water quality approach would need

to comply with both the agency's own permit from the Colorado Department of Public Health and Environment (CDPHE) and any other applicable permits along the I-25 corridor (e.g., U.S. Air Force Academy (USAFA) permit from the U.S. Environmental Protection Agency).

The EA noted that to minimize Bird Aircraft Strike Hazard, USAFA has requested that CDOT water quality mitigation measures not create any new bodies of open water that might attract waterfowl to the vicinity of USAFA's airfield near Briargate Parkway (Exit 151).

The EA also noted that increased stormwater flows into USAFA had been occurring and were degrading water quality. The *Integrated Natural Resources Management Plan for the Air Force Academy* (September 2003) noted that "Tributary streams that flow into Monument Creek from the east have been impacted by urban development, and sedimentation has been severe, especially in Kettle and Pine Creeks." The top three resulting problems, according to a regional study, were erosion, sedimentation and flooding.

Changes to the Project that Would Affect Water Quality

Based on the current design, CDOT has not proposed to change the project in any way that would affect water quality differently from what was described in the EA. While general recommendations for temporary and permanent BMPs were made in the EA, BMPs were not designed and included in the Conceptual Design Plans. BMP design will be addressed during the preliminary and final design phases of the project as part of the Design Build process.

Several natural tributaries to Monument Creek that cross I-25 in northern El Paso County have substantial significant bed and bank degradation in the eight years since the EA was approved. This degradation is of great concern to USAFA as many of the degrading tributaries cross through the Academy grounds and are a serious maintenance issue. This degradation is due to development east of I-25 and east of USAFA. CDOT has not modified I-25 in this area, but merely conveys water from USAFA property east of I-25 under the highway to the west side, also on USAFA property. Note that at the request of the USAFA, the City of Colorado Springs agreed in January 2001 to require regulation of peak flows to historic levels from proposed developments that discharge to the USAFA and are located within the City limits. However, this response did not retroactively address flows from existing development.

Changes in Analysis Data, Analysis Methods or Applicable Regulations

Several changes in applicable data and regulations related to water quality have occurred since the EA was prepared. These changes include the following:

Fountain Creek Segment 6 (Monument Creek) is included in the Colorado Section 303(D) "List of Impaired Waters and Monitoring and Evaluation List", with the effective date April 30, 2010. The impairments are noted as selenium for the portion of the reach located downstream of Mesa Road (central Colorado Springs) and *E. coli* bacteria (May through October) throughout the reach. Neither of these impairments is generally considered to be associated with highway runoff. However, the listing of the receiving stream on the Section 303(D) list qualifies it to be considered as a "sensitive waters" under the CDOT MS4 permit. The presence of the Preble's meadow jumping mouse (a Threatened species under the federal Endangered Species Act) habitat along the receiving waters also qualifies it for the "sensitive waters" designation. The sensitive waters designation is to be considered in the selection of BMPs for the project in accordance with the CDOT Water Quality Program.

FIGURE 2. Project Area Map Showing Significant Water Courses and Jurisdictional Areas

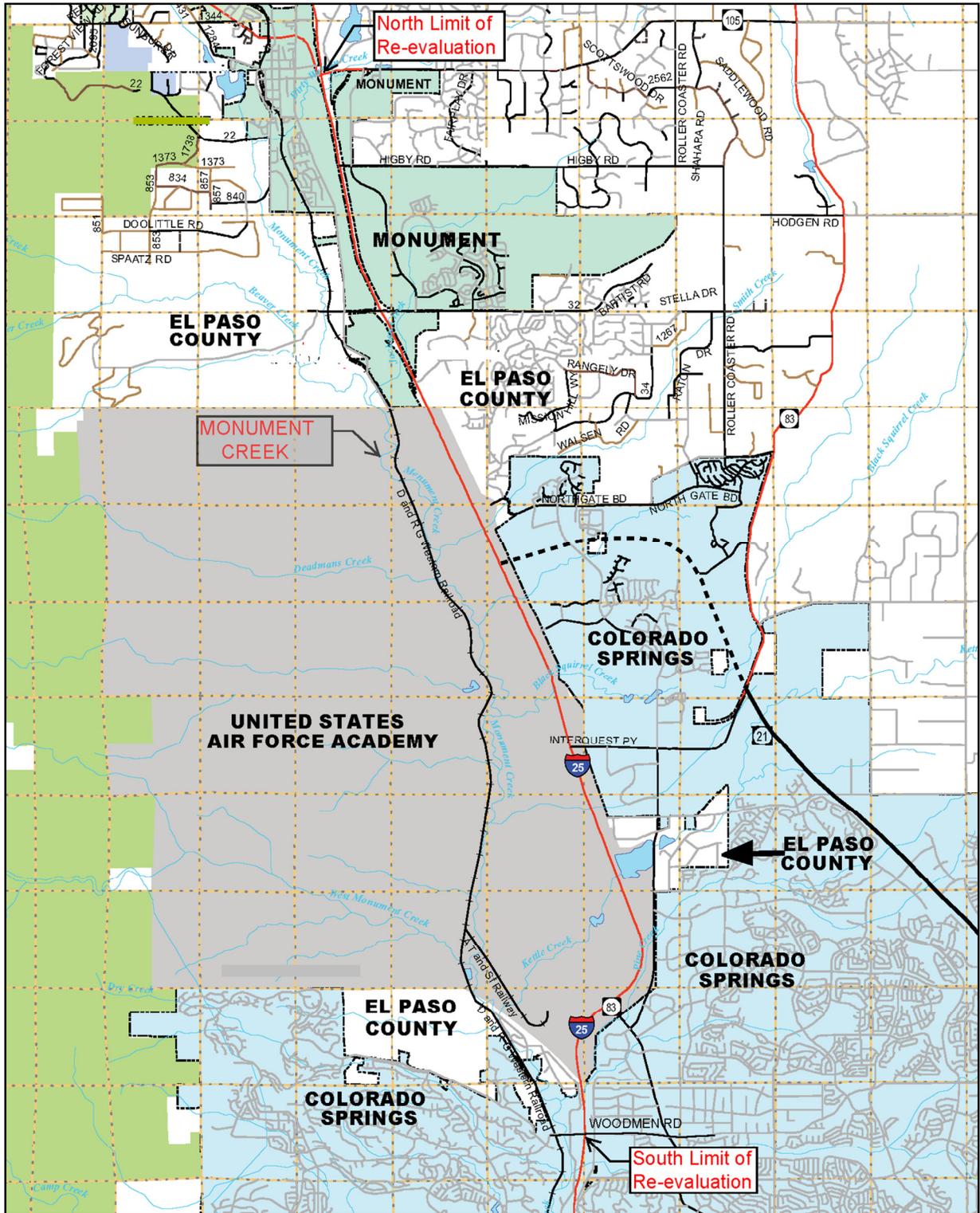


TABLE 1
2002 Stream Classifications and Water Quality Standards for Fountain Creek Basin Segment 6

Designation	Classification	Physical & Biological Standards	Inorganic (mg/L)	Metals (µg/L)
Use Protected	Aq Life Warm 2 Recreation 2 Water Supply Agriculture	D.O.=6.0 mg/L pH=6.5-9.0 <i>E.coli</i> =200/100ml	NH3(ac)=TVS* B=0.75 NH3(ch)=0.10 NO2=0.5 Cl2(ac)=0.019 NO3=10 Cl2(ch)=0.011 Cl=250 CN=0.005 SO4=250 As(ac)=50 (Trec) Cd(ac/ch)=TVS* CrIII(ac)=50(Trec) CrVI(ac/ch)=TVS* Cu(ac/ch)=TVS*	Fe(ch)=300(dis) Fe(ch)=1000(Trec) Pb(ac/ch)=TVS* Mn(ch)=71(dis) Hg(ch)=0.01(tot) Ni(ac/ch)=TVS* Se(ac/ch)=TVS* Ag(ac/ch)=TVS* Zn(ac/ch)=TVS*

*TVS = Table Value Standards. These standards are a function of hardness of the receiving stream.

Use-Protected: These are waters that the Colorado Department of Public Health and Environment, Water Quality Control Commission has determined do not warrant the special protection provided by the outstanding waters designation or the antidegradation review process.

Agriculture: These surface waters are suitable or intended to become suitable for irrigation of crops usually grown in Colorado and which are not hazardous as drinking water for livestock.

Aquatic Life Warm 2: These are waters that are not capable of sustaining a wide variety of cold or warm water biota, including sensitive species, due to physical habitat, water flows or levels, or uncorrectable water quality conditions that result in substantial impairment of the abundance and diversity of species.

Domestic Water Supply: These surface waters are suitable or intended to become suitable for potable water supplies. After receiving standard treatment (defined as coagulation, flocculation, sedimentation, filtration, and disinfection with chlorine or its equivalent) these waters will meet Colorado drinking water regulations and any revisions, amendments, or supplements thereto.

Recreation 2: These surface waters are not suitable or intended to become suitable for primary contact recreation uses, but are suitable or intended to become suitable for recreational uses on or about the water which are not included in the primary contact subcategory, including but not limited to wading, fishing and other streamside or lakeside recreation.

Acronyms used in the table

Ac	acute (1-day)	Cu	copper	P	phosphorus
Ag	silver	dis	dissolved	Pb	lead
Al	aluminum	D.O.	dissolved oxygen	pH	measure of acidity or basicity
As	arsenic	E.Coli	escherichia coli	S	sulfide as undissociated H2S
B	boron	F	fluoride	Sb	antimony
Ba	barium	Fe	iron	Se	selenium
Be	beryllium	Hg	mercury	SO4	sulfate
Cd	cadmium	mg/l	milligrams per liter	Tl	thallium
ch	chronic (30-day)	ml	milliliters	Tot	total
Cl	chloride	Mn	manganese	Trec	total recoverable
Cl2	residual chlorine	NH3	ammonia as N(nitrogen)	TVS	table value standard
CN	free cyanide	Ni	nickel	U	uranium
CrIII	trivalent chromium	NO2	nitrite as N (nitrogen)	µg/l	micrograms per liter
CrVI	hexavalent chromium	NO3	nitrate as N (nitrogen)	Zn	zinc

The Section 303(D) list is updated on a two year cycle. According to CDPHE personnel, the Section 303 (D) 2012 list was approved by the Colorado Water Quality Control Commission in February 2012. The 2012 list has not yet been approved by the EPA. Fountain Creek Segment 6 (Monument Creek) is included on the 2012 List of Impaired Waters for *E. coli*. The selenium impairment has been removed from the segment. A Total Maximum Daily Load (TMDL) has not yet been developed for Fountain Creek Segment 6 (Monument Creek).

Colorado's Water Control Commission Regulation 32 (Classifications and Numeric Standards for Arkansas River Basin, effective date, January 1, 2012) includes updated stream classifications and water quality standards for Fountain Creek Segment 6 (Monument Creek). The data as copied from the 2012, Regulation 32 document is shown on page 7. Classifications have remained the same as shown those shown in 2004 with the exception of the "recreation" classification which was shown as "recreation class 2" in 2004 and is now "recreation class E". The table does not show the water as "use protected" as it did in 2004. However, the text on page 54 of Regulation 32 indicates that Fountain Creek Segment 6 is qualified for a use protected designation. Several of the numeric standards shown in the 2012 table are different than those in the 2004 table, shown on page 2 of this memorandum.

I-25 in northern El Paso County overlaps four separate MS4 permit areas as shown on Figure 2, Page 3. From south to north the MS4 permit areas include the City of Colorado Springs, El Paso County, the United States Air Force Academy (USAFA), and the Town of Monument. CDOT's permit applies for the entire corridor. The CDOT MS4 permit authorizes the discharge of stormwater from the municipal separate stormwater system owned and operated by CDOT within these other MS4 permit areas. The expiration date of the CDOT MS4 permit was December 31, 2011. A new permit is in the process of being drafted by CDPHE and should be available by the summer of 2012. The current permit will remain in effect until the new permit is issued.

While not yet confirmed, it is expected that all I-25 widening in northern El Paso County project segment will be designed, constructed, and maintained under the CDOT MS4 Permit and the Colorado Discharge Permit System (CDPS) General Permit for Stormwater Discharges Associated with Construction Activities. There is potential that the portion of the project that is within the land controlled by the USAFA will need to be designed, constructed and maintained under the NPDES General Permit No. COR042000 and NPDES Construction General Permit COR100000F. Additional permits to cover other construction activities like as dewatering may also be required.

As the result of inadequate compliance with MS4 requirements that resulted in a November 2005 Notice of Violation, CDOT's stormwater quality efforts now must conform to additional specific requirements under a Compliance Order on Consent (the Consent Order) issued by the Colorado Department of Public Health and Environment in 2009. The requirements of the Consent Order that impact individual projects include but are not limited to:

- Stormwater training for CDOT employees who are involved in project design, oversight and maintenance activities related to stormwater drainage and quality.
- Incorporation of functional stormwater management system design into the planning and design phase of every construction project.
- Preparation of adequate site-specific stormwater management plans (SWMP) prior to submittal of applications for permits associated with the project.

- Specific inspections and audits, inspection and audit frequency, inspection protocol and record keeping, and meetings all for the purpose of assuring adequate installation and maintenance of BMPs during project construction and obtaining final stabilization upon construction completion.
- Compliance requirements of the Consent Order are to be incorporated into construction contracts or special conditions to such contracts, and contractors bidding on CDOT projects are to be informed of the requirements.

In compliance with the requirements of the CDOT MS4 permit and the Consent Order, CDOT has developed and published several documents including the following:

- The *CDOT Water Quality Program Book*, 2009. This is a single source reference which identifies the major elements of the CDOT Water Quality Program.
- The *CDOT New Development and Redevelopment Program*, February 2004. This document provides processes and guidelines to be followed for new highway and significant redevelopment highway projects. The processes and guidelines are primarily related to determining if permanent BMPs are required during project development and selection and design of appropriate BMPs for projects. This document is included in the *CDOT Drainage Design Manual, 2004*.
- *CDOT Standard Specifications for Road and Bridge Construction 2011*. Contains new provisions related to water quality and erosion control including the requirement for an on-site environmental pre-construction attended by specific CDOT and Contractor personnel.
- *Sample SWMP Notebook*, March 20, 2009. This document is a training tool to aid in the preparation of adequate Stormwater Management Plans (SWMPs) for CDOT projects.
- *CDOT Standard Plans and M & S Standards. Revised July 29, 2011*. Contains revisions and additions to the Standard Plans for Temporary Erosion Control.
- *CDOT Erosion Control and Stormwater Guide*, 2002. This document provides some information regarding water quality regulations, pollutants associated with highway runoff and effects on receiving waters, and information and design guidelines for temporary/construction and permanent BMPs.
- *CDOT Erosion Control and Stormwater Quality Field Guide*, 2011. This document provides guidance for design, installation and maintenance of temporary/construction BMPs.

Average Water Quality Capture Volume

In accordance with the CDOT New Development and Redevelopment Stormwater Program, permanent BMPs will be designed to remove at least 80% of the average annual TSS loading from the average storm events, OR to provide 100% of the Stormwater Quality Capture Volume (WQCV). The WQCV is generally defined as the first 0.5 inch of water from impervious surfaces. Based on the average cross sections widths between interchanges and the 0.5 inch depth, the portion of the proposed I-25 widening south of Interquest Parkway will generate an average WQCV of 6,800 cubic feet per 1,000 linear feet of highway. The portion of the

Proposed Action north of Interquest Parkway will generate an average WQCV of 5,100 cubic feet per 1,000 linear feet of highway. The northern portion is proposed to have a narrower pavement width than southern portion which is the reason that it will generate a smaller WQCV than the southern section.

The values above should be considered approximate and should only be used for general planning purposes. At interchanges where additional impervious area will be present due to ramps and overpasses, the WQCV will be higher. Permanent BMPs will be installed at or near the interchanges to treat the WQCV.

Where practical, consideration should be given to incorporating control of peak flow rates up to the 100-year recurrence event into the design of permanent BMPs for the project to mitigate erosion in the downstream channels as a result of construction of the project. The USAFA will be given an opportunity to review and comment on PWQ design. A design concept known as "Full Spectrum Detention" has been developed by the Urban Drainage and Flood Control District and may be appropriate for use on the I-25 widening project.

Conclusion

Interagency consultation and cooperation is always an important element in planning and implementing water quality mitigation. For the 2012 widening effort, ongoing cooperation with USAFA will be critical to the success of the project and will potentially result in improved waterquality.

The project will utilize temporary BMPs to treat stormwater during construction and will construct permanent BMPs for long term treatment of runoff from the highway. CDOT's mitigation efforts addressing the Proposed Action will have the additional benefit of treating stormwater runoff from the existing roadway, which was constructed long before modern MS4 requirements. Thus, CDOT's efforts with the Proposed Action are expected to result in cleaner stormwater discharges than occur in the current condition.

The following page contains a tabular summary of primary project impacts and mitigation associated with water quality as identified in the 2004 EA and in the current re-evaluation.

TABLE 2. 2012 Stream Classifications and Water Quality Standards for Fountain Creek Basin Segment 6

Designation	Classifications	NUMERIC STANDARDS						TEMPORARY MODIFICATIONS AND QUALIFIERS
		PHYSICAL and BIOLOGICAL	INORGANIC mg/l		METALS ug/l			
Use-Protected	<i>Aq Life Warm 2 Recreation E Water Supply Agriculture</i>	D.O. = 5.0 mg/l pH = 6.5-9.0 <i>E.Coli</i> =126/100ml	NH3(ac/ch)=TVS CL2(ac)=0.019 CL2(ch)=0.011 CN=0.005	B=0.75 NO2=0.5 NO3=10 Cl=250 SO4=329	As(ac)=340 As(ch)=0.02-10(Trec) Cd(ac/ch)=TVS CrIII(ac)=50(Trec) CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1430(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis)	Hg(ch)=0.01(tot) Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac/ch)=TVS Zn(ac/ch)=TVS	Temporary modification: type (iii): Cu(ac/ch)=current condition, Expiration date of 12/31/2013

Source: Colorado Department of Public Health and Environment, Water Quality Control Commission, 5 CCR 1002-32, Regulation No. 32, *Classifications and Numeric Standards for Arkansas River Basin*, Effective January 1, 2012.

Use-Protected: These are waters that the Colorado Department of Public Health and Environment, Water Quality Control Commission has determined do not warrant the special protection provided by the outstanding waters designation or the antidegradation review process. Note that while the 2012 Regulation 32 table does not show this designation, the text on page 54 of the regulation indicates that the segment is qualified for the designation.

Agriculture: These surface waters are suitable or intended to become suitable for irrigation of crops usually grown in Colorado and which are not hazardous as drinking water for livestock.

Aquatic Life Warm 2: These are waters that are not capable of sustaining a wide variety of cold or warm water biota, including sensitive species, due to physical habitat, water flows or levels, or uncorrectable water quality conditions that result in substantial impairment of the abundance and diversity of species.

Domestic Water Supply: These surface waters are suitable or intended to become suitable for potable water supplies. After receiving standard treatment (defined as coagulation, flocculation, sedimentation, tration, and disinfection with chlorine or its equivalent) these waters will meet Colorado drinking water regulations and any revisions, amendments, or supplements thereto.

Recreation E: These surface waters are used for primary contact recreation or have been used for such activities since November 28, 1975.

See TABLE 1 earlier in this memorandum for a list of abbreviations utilized in the Stream Classifications and Water Quality Standards tables.

TABLE 3. Summary of Previously and Currently Identified Water Quality Impacts and Mitigation

EA 2004 – No-Action Alternative	EA 2004 – Impacts of Proposed Action	EA 2004 – Mitigation	2012 – What Has Changed	Re-evaluation 2012 – No Action	Re-evaluation 2012 – Impacts of Proposed Action	Re-evaluation 2012 – Mitigation
<p>Water quality would be negatively impacted because of increased contaminant concentrations in highway runoff that result from increased traffic congestion and growth in traffic volumes.</p> <p>Continued development within the watersheds would lead to additional water quality degradation both during construction of new developments and in the long term. Increased impervious areas would degrade wetlands adjacent to I-25 due to increased runoff.</p>	<p>An increase in roadway surface area would provide greater pollutant loads to be transported into adjacent streams. Lead, copper, and zinc pollutant loadings could increase because of increased impervious surfaces. Increased traffic on I-25 would increase the potential for waters to be impacted from deicing activities. An increase in the use of sand on I-25 would also impact water quality.</p>	<p>Adhering to CDOT’s CDPS Stormwater Permit, MS4 Discharge Permit, and CDOT Standard Specifications for Road and Bridge Construction, CDOT will implement temporary and permanent water quality best management practices.</p> <p>Permanent channel stabilization and sediment collection facilities will be part of the project.</p> <p>Other preventive strategies include:</p> <ul style="list-style-type: none"> • Developing a stormwater management plan • Designing storm drainage systems to prevent sediment and pollutants from being carried into wetlands, Monument and Fountain Creeks, and their tributaries. • Improving existing stream-side wetlands and riparian habitats • Using non-structural Best Management Practices such as street sweeping and public awareness programs. 	<p>The receiving water “Fountain Creek Segment 6” (Monument Creek) has been added to the 303 (D) list for selenium and E-coli impairments and the numeric water quality standards have been revised.</p> <p>The USAFA has experienced significant channel erosion and sedimentation issues due to upstream development. The USAFA has requested for the City of Colorado Springs to require regulation of peak 2-, 5-, 10-, 50-, and 100-year storm frequency flows to historic levels from proposed developments that discharge to the USAFA.</p> <p>In compliance with the requirements of the CDOT MS4 permit and the Consent Order, CDOT has developed and published several documents associated with the administration of their water quality program.</p> <p>The CDOT MS4 permit has passed its expiration date and is being re-written by CDPHE. The re-write is expected to be complete in the summer of 2012.</p>	<p>No changes to EA-identified water quality impacts.</p>	<p>No changes to EA-identified water quality impacts.</p>	<p>While some stormwater BMP design standards have changed since the EA was prepared, the general concepts and requirements for BMPs have not changed. The BMPs for the Proposed Action will be determined in the preliminary and final design phases of the project.</p> <p>Interagency consultation and cooperation is always an important element in planning and implementing water quality mitigation. For the 2012 widening effort, ongoing cooperation with USAFA will be critical to the success of the project.</p> <p>Per USAFA’s request in 2002, confirmed to be still in effect, CDOT’s water quality mitigation will avoid creating new areas of open water attractive to waterfowl. USAFA will be allowed to comment on plans for permanent water quality ponds. Re-seeding will be done using native seed.</p> <p>BMPs will follow CDOT’s MS4 requirements.</p>
	<p>During construction, there would be the potential for an increase of pollutants in runoff due to erosion and sediments.</p>	<p>Temporary sediment collection facilities will be established during construction activities.</p>	<p>The Consent Decree issued in 2009 tightens the requirements for stormwater management compliance on CDOT construction projects that have disturbance areas of 1 acre or more.</p>	<p>No changes to EA-identified water quality impacts during construction.</p>	<p>No changes to EA-identified water quality impacts during construction.</p>	<p>Water quality mitigation during construction will be subjected to tighter compliance standards with daily bmp inspections and SWMP updates. CDPS and other applicable permits will be obtained.</p>