



2010 Stormwater Master Plan Update



Prepared by
Castle Rock Water Engineering
March 2011

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RESOLUTION NO. 2011- 27

**A RESOLUTION ADOPTING THE
2010 STORMWATER MASTER PLAN UPDATE**

WHEREAS, the Town of Castle Rock (Town) previously adopted the Stormwater Master Plan (SWMP) in 2004; and

WHEREAS, the 2010 Stormwater Master Plan Update shall be used as a companion document to the SWMP; and

WHEREAS, copies of the 2010 Stormwater Master Plan Update will be available for purchase at a cost of \$50 or available at www.CRgov.com; and

WHEREAS, Town Council has reviewed the 2010 Stormwater Master Plan Update, and wishes to adopt said plan by resolution.

NOW, THEREFORE, BE IT RESOLVED BY THE TOWN COUNCIL OF THE TOWN OF CASTLE ROCK AS FOLLOWS:


Section 1. Approval. The 2010 Stormwater Master Plan Update in the form attached as Exhibit 1 is hereby approved.

PASSED, APPROVED AND ADOPTED this 5th day of April, 2011, by the Town Council of the Town of Castle Rock, Colorado, on first and final reading by a vote of 6 for and 0 against.

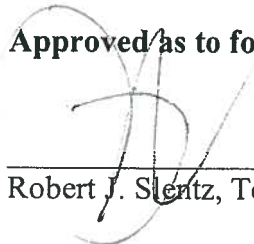
ATTEST:


Sally A. Misare, Town Clerk

TOWN OF CASTLE ROCK


Ryan Reilly, Mayor

Approved as to form:


Robert J. Slentz, Town Attorney

Approved as to content:


Ron R. Redd, P.E., Utilities Director

**Preparation of
the Updates**

The Town of Castle Rock wishes to acknowledge those who contributed to the preparation of the *Stormwater, Wastewater, Water, and Water Resources Master Plan Updates*.

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Consultant Support for Rates and Fees Analysis

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In addition, the Town would like to thank all those who provided a review of the draft *Master Plan Updates*.

Definitions and Acronyms

AC	Acre
BMP	Best Management Practice
CADD	Computer Aided Drafting Design
CCBWQA	Cherry Creek Basin Water Quality Authority
CDOT	Colorado Department of Transportation
CDPHE	Colorado Department of Health and Environment
cfs	cubic feet per second
CIP	Capital Improvement Project
CLOMR	Conditional Letters of Map Revision
CMMS	Computerized Maintenance Management System
USACE	United States Army Corps of Engineers
CRS	Community Rating System
CTP	Cooperating Technical Partners
CUHP	Colorado Urban Hydrograph Procedure
CWA	Clean Water Act
CWCB	Colorado Water Conservation Board
DESC	Drainage, Erosion, & Sediment Control
DFIRM	Digital Flood Insurance Rate Map
DRCOG	Denver Regional Council of Government
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FIA	Federal Insurance Administration
FIMS	Facility Infrastructure Management System
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
FPS	Feet Per Second
FT	Feet
FTE	Full Time Employee
GESC	Grading, Erosion, & Sediment Control
GIS	Geographic Information System
GPS	Geo-positioning Systems

HCP	Habitat Conservation Plan
in, In	Inch
Lf, LF	Linear Feet
LOMR	Letters of Map Revision
MCM	Minimum Control Measure
MS4	Municipal Separate Storm Sewer System
N/A	Not Applicable
NFIP	National Flood Insurance Program
NPDES	National Pollutant Discharge Elimination System
NRCS	National Resources Conservation Service
O&M	Operation and Maintenance
PDF	Portable Document Format
RCP	Reinforced Concrete Pipe
ROW	Right-of-Way
SDFs	System Development Fees
sf, SF	Square Foot
SFE	Single Family Equivalent
SWMM	Stormwater Management Model
SWMP	Stormwater Master Plan
TIFF	Tag Image File Format
TMAL	Total Maximum Annual Load
Town	Town of Castle Rock
UDFCD	Urban Drainage and Flood Control District
UDSWMM	Urban Drainage Storm Water Management Model
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WET	Water Education for Teachers
WQCC	Water Quality Control Commission
WWMP	Wastewater Master Plan
WMP	Water Master Plan
WRMP	Water Resources Master Plan
yr, YR	Year

1. Introduction

This Stormwater Master Plan update highlights critical findings and recommendations resulting from a reassessment of stormwater program needs for the Town of Castle Rock. In 2004, the Town prepared a Stormwater Master Plan (SWMP) that examined the existing stormwater programs and system infrastructure and identified new stormwater program requirements, as well as capital improvement projects required to provide service to existing residents and to address future development through build out of the Town. This update is designed to be used as a companion document to the original 2004 SWMP.

The original 2004 Master Plan identified seven stormwater guiding principles and policies that were developed through extensive outreach with the community and ultimately adopted by Town Council. These guiding principles still form the basis for the Town's stormwater program and are outlined below.

Principle 1 – Protect people and property; Manage stormwater through minimizing potentially hazardous conditions associated with stormwater runoff, flooding, and erosion.

- Restrict land uses and activities that would threaten public health and safety in time of flood.
- Restrict uses that are particularly vulnerable to flood damage, so to alleviate hardship and eliminate demands for public expenditures for relief and protection.
- Require permitted floodplain uses, including public facilities which serve such uses, to be protected against floods through the uses of flood proofing, and other protective measures at the time of initial construction or reconstruction.
- Protect the public from the burden of avoidable financial expenditures for flood control and relief by regulating all uses within the floodplain areas.
- Develop design and construction standards for infrastructure in drainageways that will minimize the probability of flood damage.
- Delineate floodplains and provide this information as part of the public record.
- Encourage low-intensity uses such as agriculture, parking lots, recreation, and open space within the floodplain.

Principle 2 – Involve the public and integrate community input in the stormwater master planning process.

- Use public input as a significant factor in decision-making.
- Use a variety of public involvement vehicles to receive input, including public meetings, newsletters, and web sites.
- Coordinate and gain understanding of perspectives on the stormwater master program with Town Council, Public Works & Utilities Commission, Douglas County, the public, and other agencies and stakeholders.

Principle 3 – Protect water quality and mitigate impacts to receiving waters.

- Comply with the NPDES Stormwater Phase II permit through managing construction and post-construction runoff, preventing pollution from municipal operations, eliminating illicit connections and discharges, and educating the public.
- Protect water quality by controlling erosion, and mitigating pollutant loading to environmentally sensitive drainages through ordinances, policies, design criteria, and best management practices (BMPs).
- Coordinate water quality programs with other state, federal and local agencies, and integrate with other water quality and environmental programs.
- Encourage regional approaches to stormwater detention including regional detention of storm flows to reduce flood peaks to the Cherry Creek and Chatfield basins.

Principle 4 – Protect hydraulic characteristics of small watercourses and the storage capacity of floodplains that make up part of the urban drainage system.

- Regulate filling, dumping, and piping so as to maintain natural storage capacity and flow characteristics.
- Prohibit encroachment into small watercourses and maintain their water carrying capacity.
- Provide sufficient capacity of floodways and drainages to convey flood flows which can be reasonably expected to occur and address erosion caused through stream stabilization.

Principle 5 – Provide for effective long-term operation and maintenance of stormwater facilities.

- Design stormwater systems in a manner that allows for cost-effective routine operation and maintenance.
- Balance aesthetics and long-term maintenance.
- Maintain reasonable access to all stormwater structures.

Principle 6 – Encourage coordination of infrastructure needs and aesthetic qualities in storm drainage planning.

- Integrate storm drainage planning with other infrastructure needs (i.e. streets, trails and bridges) to provide comprehensive project solutions.
- Coordinate and communicate stormwater planning for consistency with the Town's other master planning efforts.
- Use floodplain preservation approaches as appropriate and uses such as greenbelt, open space, recreation, and pedestrian and riding trails that complement open space and recreation corridors.

Principle 7 – Operate the stormwater program as a business, balancing revenue and expenses.

- Prioritize capital improvements based on need and costs.
- Fund stormwater system improvements, operation, and maintenance through fees that are regularly reviewed and updated.
- Identify other funding mechanisms to offset costs of the stormwater program.
- Participate in regional stormwater management solutions to offset costs and maximize flood control benefits. Involve other governmental agencies as appropriate.
- New development is responsible for constructing development-specific stormwater infrastructure and drainage improvements and for funding an appropriate share of Town-wide improvements.

These guiding principles have shaped the stormwater program over the past six years ultimately resulting in the program that is summarized in this Master Plan. These principles will continue to guide the program over the next five years, and well into the future.

2. Summary of Completed Work

This section contains a summary of work that has been completed by the Town since the adoption of the 2004 SWMP. This includes a review of



program development & permit compliance activities, watershed/drainageway master plans & flood hazard area delineations FHAD's, capital project construction, and maintenance.

In 2004 when the original stormwater master plan was developed, the Town's stormwater program had only existed for 1 year. Since 2004 the Town has built a complete stormwater division that oversees all aspects of stormwater regulation for the Town. The following section summarizes the

activities completed as the program has developed. Major areas that were addressed and developed include a new FEMA floodplain program, the NPDES Phase II MS4 Permit program regulating stormwater quality, a new dedicated stormwater capital improvement program (CIP) including watershed/drainageway master plans and capital improvement projects, and the creation of a new stormwater maintenance division. The Town has added several staff in the last 6 years to support the new program including a Stormwater Utility Engineering Manager, a Stormwater Project Manager, three inspectors, and three maintenance personnel, as well as several management and support staff that support the entire utilities department. The total Full-Time Equivalent (FTE's) for the stormwater program currently stand at 10.35 FTE's.

The Town's SWMP is a living document that will be periodically reviewed and updated as conditions change and opportunities present themselves. The 2004 SWMP contained a summary of recommendations that were part of the original cost assumptions for the development of the stormwater program. Those original recommendations have been provided in Tables 2-1 through 2-10 with the inclusion of a brief description of activities that have been completed to support the implementation of the recommendation.

Table 2-1

SYSTEM MAPPING RECOMMENDATIONS		
2004 Master Plan Recommendation	2010 Implementation Status	2010-2015 Recommendation
<ul style="list-style-type: none"> • Establish Town Geographic Information System (GIS) standards. 	Standards have been established are managed jointly by the Town's GIS division and the utilities department GIS specialist.	Maintain current standards.
<ul style="list-style-type: none"> • Develop comprehensive GIS for Town's Storm-water system. 	The Town's stormwater GIS is currently approximately 60% completed.	Complete the remaining mapping required and keep database current as new projects are completed.
<ul style="list-style-type: none"> • Require GIS submittal of as-builts that meet Town GIS standards. 	All record drawings (as-builts) are submitted in an electronic format that meet Town Standards.	No further recommendation.
<ul style="list-style-type: none"> • Convert existing as-builts and Computer Aided Drafting Design (CADD) files to GIS. 	All existing record drawings (as-builts) have been converted to pdf and filed electronically.	Link all files to GIS when completed.
<ul style="list-style-type: none"> • Develop databases to support inventory, operation and maintenance of storm-water systems. 	GIS network map in progress. Outfalls and ponds are tracked in separate excel spreadsheets.	Formalize all databases into a formal asset management program.
<ul style="list-style-type: none"> • Field verify locations of selected stormwater structures. 	Field verification of approximately 10% of system completed.	Complete field verification of remaining stormwater network.
<ul style="list-style-type: none"> • Resolve parcel discrepancies in orthophoto data sets, basemapping and GIS database with Douglas County. 	Parcel discrepancies have been resolved.	No further recommendation.
<ul style="list-style-type: none"> • Evaluate Geo-positioning Systems (GPS) as a tool to facilitate mapping efforts for a variety of stormwater programs. 	The Utilities department has Purchased survey grade GPS Equipment to complete in house surveying and mapping.	Maintain current equipment for in house mapping.

Table 2-2

FEMA FLOODPLAIN RECOMMENDATIONS		
2004 Master Plan Recommendation	2010 Implementation Status	2010-2015 Recommendation
<ul style="list-style-type: none"> • Participate in the National Flood Insurance Program (NFIP) • Community Rating System (CRS). 	Town has not participated in the CRS because the reduction in insurance rates did not warrant the effort to participate.	Re-evaluate participation periodically.
<ul style="list-style-type: none"> • Update and maintain Conditional Letters of Map Revisions/Letters of Map Revisions (CLOMR/LOMR) database. 	CLOMR's and LOMR's hard copies are maintained at Utilities. Electronic copies can be found in the FEMA Map database.	Maintain hard copies of CLOMR's/LOMR's in stormwater division.
<ul style="list-style-type: none"> • Maintain commitment to the NFIP program by staying active in floodplain management programs. 	Town is currently active in flood plain management programs and is committed to participation in the NFIP.	Maintain commitment to NFIP.
<ul style="list-style-type: none"> • Secure Federal Emergency Management Agency (FEMA) funding to subsidize floodplain mapping efforts. 	Funding has been secured in 2005 and 2010 for two separate mapping update projects.	Continue to seek opportunities for funding partnerships to update maps.
<ul style="list-style-type: none"> • Assist with the development and initiation of floodplain mapping projects in conjunction with the Colorado Water Conservation Board (CWCB) and Urban Drainage and Flood Control District (UDFCD). 	Original 2005 DFIRM project was completed through CWCB and UDFCD. In 2010 began participation in second joint update with UDFCD.	Continue to seek opportunities to partner on map updates.
<ul style="list-style-type: none"> • Consider setback standards, such that development outside a buffer width from any identified FEMA regulatory floodplains will provide freeboard for events in excess of the 100-year frequency event and promote open space within the Town. 	Additional setbacks have not been adopted by the Town to date.	Evaluate additional setbacks.
<ul style="list-style-type: none"> • Prepare adequate base mapping to offset costs associated with map updates; coordinate with Douglas County. 	Base mapping has been established.	No further recommendation.

Table 2-3

SYSTEM EVALUATION RECOMMENDATIONS		
2004 Master Plan Recommendation	2010 Implementation Status	2010-2015 Recommendation
<ul style="list-style-type: none"> • Purchase and familiarize staff with Stormwater Management Model (XPSWMM) modeling software; interface with GIS database. 	All drainageway master plan hydrology is completed using XPSWMM and Town staff has had training sufficient to review models.	Train additional staff in XPSWMM.
<ul style="list-style-type: none"> • Verify basin boundaries and critical hydrologic inputs (percent impervious, development type, etc.); coordinate with set-up of maintenance program in order to familiarize staff with the storm drainage system. 	Several of the Town's watersheds have been evaluated and refined in the master planning process.	Complete remaining drainageway master plans.
<ul style="list-style-type: none"> • Refine hydrologic/hydraulic model to incorporate verification of storm sewer system as-built conditions. 	Watershed Sub-Basin Hydrologic and hydraulic models have been refined. Storm sewer systems have not been incorporated to date.	Complete storm sewer mapping and incorporate into models.
<ul style="list-style-type: none"> • Prepare Master Drainageway Plans for McMurdo Gulch, Mitchell Gulch, Plum Creek, Seller's Gulch and 6400 Tributary. 	Plans have been completed for these watersheds/drainageways.	Periodically review and update as necessary.

Table 2-4

CAPITAL IMPROVEMENT PROJECTS RECOMMENDATIONS		
2004 Master Plan Recommendation	2010 Implementation Status	2010-2015 Recommendation
<ul style="list-style-type: none"> • Develop master plan and outfall system studies for priority watersheds. 	Plans have been developed for 7 of 12 priority drainages.	Complete plans for 5 remaining priority drainages
<ul style="list-style-type: none"> • Implement 5-year CIP program based on available funding. 	5 year CIP has been implemented on a cash funded basis instead of through bonding as suggested in the original 2004 master plan.	Continue to implement CIP on a cash funded basis.
<ul style="list-style-type: none"> • Review and update CIP list as projects are implemented. 	CIP is updated annually and established for 5 years. Stormwater master plan is updated every 5 years.	Complete stormwater master plan update in 2015.
<ul style="list-style-type: none"> • Coordinate activities through the Habitat Conservation Plan (HCP) that is currently being developed by Douglas County in order to mitigate the impacts to endangered species habitat in riparian areas. 	Town HCP has been adopted and all stormwater projects are coordinated with the HCP.	Update HCP to reflect revised build out CIP.

Table 2-5

INSPECTION AND MAINTENANCE RECOMMENDATIONS		
2004 Master Plan Recommendation	2010 Implementation Status	2010-2015 Recommendation
<ul style="list-style-type: none"> Formalize and document system operation, maintenance and inspection coordination protocol with Town Department's (i.e., Fire Department coordination on Spill Response Procedures). 	IDDE program has been developed and adopted by the Town.	Continue to implement existing program.
<ul style="list-style-type: none"> Establish formal maintenance and inspection training protocols for Town staff involved in system maintenance and inspection. 	Pond and Outfalls are inspected as required by the Towns MS4 permit.	Continue to inspect Ponds and outfalls. Develop program to inspect proprietary BMP's and stormsewer systems.
<ul style="list-style-type: none"> Coordinate training opportunities with Douglas County entities. Erosion control inspection and maintenance hardware/software training are two examples of training programs that can be facilitated cost effectively through the Douglas County land use agencies. 	Training is coordinated regionally through several entities including Douglas County.	Training opportunities should be coordinated with Douglas County and the Colorado Stormwater Council.
<ul style="list-style-type: none"> Evaluate use of GPS and ArcView handheld units, including appropriate hardware and software to manage storm-water maintenance programs (software with the mobile handheld units). 	Hand held units have not been implemented to date.	Develop and implement formal asset management program for stormwater.

Table 2-6

STORMWATER QUALITY AND REGULATORY RECOMMENDATIONS		
2004 Master Plan Recommendation	2010 Implementation Status	2010-2015 Recommendation
<ul style="list-style-type: none"> • Comply with the Stormwater Phase II permit requirements by implementing the “measurable goals” as outlined and scheduled in Section 8.4. 	Town has implemented all measurable goals and maintained compliance with the NPDES Phase II MS4 Permit.	Continue to maintain compliance with existing program element requirements.
<ul style="list-style-type: none"> • Participate in Douglas County Stormwater Phase II Work Group to maximize cooperation and minimize costs for Stormwater Phase II Permit development and implementation. 	Town is an active member of the Douglas County Phase II work group and has led many cooperative projects through that group.	Continue leadership role in this organization.
<ul style="list-style-type: none"> • Secure an estimated \$167,000 in Stormwater Utility funds (2003 dollars) for the sole purpose of Stormwater Phase II program implementation. 	Funds were secured and a formal utility was established in 2004 with full program funding.	Evaluate funding requirements annually, and adjust accordingly.
<ul style="list-style-type: none"> • Dedicate sufficient Town staff to stormwater permit compliance. 	The Town has a dedicated stormwater division that has 10.35 FTE’s.	Evaluate staffing requirements annually, and adjust accordingly.
<ul style="list-style-type: none"> • Integrate Stormwater Guiding Principles in other Town programs and initiatives. 	Stormwater guiding principles are implemented Townwide.	Continue implementation of principles.
<ul style="list-style-type: none"> • Encourage watershed-based trading as a vehicle to reuse wastewater for irrigation purposes in the Cherry Creek and Chatfield basins. 	Watershed based trading has been determined to not be appropriate for the Town.	No further recommendations.

Table 2-7

RECOMMENDATIONS FOR UPDATED CRITERIA, REGULATIONS, AND ORDINANCE		
2004 Master Plan Recommendation	2010 Implementation Status	2010-2015 Recommendation
<ul style="list-style-type: none"> • Authorize the preparation of an updated Public Works Regulations to reflect the Town’s “Stormwater Guiding Principles and Policies”, including stormwater drainage, design and water quality requirements. 	<p>A new stormwater design criteria manual was completed in partnership with Douglas County and other surrounding jurisdictions and adopted in 2007.</p>	<p>Periodically review and update criteria as necessary.</p>
<ul style="list-style-type: none"> • Support a public process to garner input from a broad array of interested stakeholders on any update to the Public Works Regulations. 	<p>Public outreach was a key component to the 2007 criteria adoption and was coordinated through the Castle Rock Economic Development Council EDC.</p>	<p>Continue to utilize Castle Rock EDC group for stakeholder input to criteria updates.</p>
<ul style="list-style-type: none"> • Recognize the use of UDFCD Criteria Manuals to provide support on drainage design and technical specifications. 	<p>The stormwater design criteria references the UDFCD Volume I, II, and III criteria manuals extensively.</p>	<p>Continue to utilize UDFCD Criteria by reference.</p>
<ul style="list-style-type: none"> • Review the adoption (in part or in full) of the “Douglas County Grading and Erosion Sediment Control Manual” (GESC) and “Drainage and Erosion Sediment Control Manual” (DESC). 	<p>The Douglas County DESC and GESC manuals were customized to Castle Rock and adopted in 2004 and 2006 respectively.</p>	<p>Combine the GESC and DESC manuals to facilitate consistency between the programs.</p>
<ul style="list-style-type: none"> • Utilize the “Stormwater Guiding Principles and Policies” in concert with the SWMP to guide decision-making during the interim period prior to when any potential updates to the Public Works Regulations occur. 	<p>The stormwater guiding principles were applied prior to the 2007 criteria update.</p>	<p>Continue to apply principles in conjunction with revised stormwater design criteria manual.</p>

Table 2-8

PUBLIC INVOLVEMENT RECOMMENDATIONS		
2004 Master Plan Recommendation	2010 Implementation Status	2010-2015 Recommendation
<ul style="list-style-type: none"> • Create a stormwater link in the Town's website that will address 1) what stormwater is, 2) why the Stormwater Master Plan is being implemented now, 3) information about storm water fees, and 4) contact information. (This recommendation has been recently completed with the development of the Town's website.) 	<p>The Town website contains a stormwater section that addresses items 1-4.</p>	<p>Update website as necessary. Develop a page that addresses watershed Master Plans where the public can download copies of the plans.</p>
<ul style="list-style-type: none"> • Coordinate with the Douglas County Stormwater Phase II Permit Work Group on developing public information and education materials to cost effectively support Stormwater Permit compliance. 	<p>The Town is an active leader in this work group and spearheaded the stormwater advertising campaign that prints a monthly stormwater educational message in the Colorado Community Newspaper.</p>	<p>Maintain active role in this group.</p>
<ul style="list-style-type: none"> • Implement a Speaker's Bureau on stormwater issues to speak to targeted groups, such as small business organizations. 	<p>Town staff has presented to several groups including the Rotary and Castle Rock EDC.</p>	<p>Continue speaking when opportunity arises.</p>
<ul style="list-style-type: none"> • Distribute brochures to citizens on key stormwater issues. 	<p>Stormwater messages are distributed through the Ad campaign.</p>	<p>Utilize Ad Campaign for message distribution.</p>
<ul style="list-style-type: none"> • Host Town meetings on storm water issues with fact sheets and comment forms and publicize it in the local newspapers through paid ads and/or news releases. 	<p>Public meetings are held for all major projects and master planning efforts.</p>	<p>Continue Public involvement.</p>

Table 2-9

STORMWATER UTILITY STAFFING RECOMMENDATIONS		
2004 Master Plan Recommendation	2010 Implementation Status	2010-2015 Recommendation
<ul style="list-style-type: none"> Hire a Stormwater Utility Manager housed within the Utility Department to provide leadership, oversight, and direction to the Stormwater Utility Section. 	Completed.	No further recommendations.
<ul style="list-style-type: none"> Over the next three-year period, on an as-needed basis, endorse the hiring of additional support staff (Project Engineers, Inspectors, Maintenance Personnel, and Technicians) to implement the “Stormwater Principles and Policies” and the SWMP. 	The stormwater division has hired 1 stormwater project manager, 3 stormwater inspectors, and 3 stormwater maintenance personnel.	Implement program utilizing staffing allocation with no permanent staff increases.
<ul style="list-style-type: none"> Continue coordination of storm water responsibilities with Public Works, Development Services, and the Parks and Recreation Departments. 	All core stormwater elements have transferred to the stormwater division. Coordination has occurred with other departments as needed.	Continue coordination.

Table 2-10

STORMWATER UTILITY FUNDING RECOMMENDATIONS		
2004 Master Plan Recommendation	2010 Implementation Status	2010-2015 Recommendation
<ul style="list-style-type: none"> Implement CIP Option #1, #2, #3, or #4. 	Option #4 was implemented with some modification. No bonds were issued for CIP's, all projects were cash funded. Options #1, #2, and #3 were not implemented.	Continue to operate program on a cash funded basis.
<ul style="list-style-type: none"> Evaluate becoming a member of the Urban Drainage and Flood Control District (UDFCD) as a means to effectively implement storm drainage improvements in the Town. 	Town chose not to become a member of UDFCD.	No further recommendations.
<ul style="list-style-type: none"> Complete a study to more accurately determine development impact fees. The study should evaluate if different charges for different basins or groups of basins are warranted. 	A study was completed in 2004 and revised in 2006. A new study was completed in 2010.	Evaluate annual and complete full update in 2015.
<ul style="list-style-type: none"> New 2010 Recommendation 		Complete a specific parcel impervious percentage study for all commercial properties to more accurately determine the stormwater fee on an individual parcel basis.

Watershed/Drainageway Master Plans

A significant number of Watershed Master Plans and Capital Improvement Projects have been completed since 2004. Table 2-11 summarizes Watershed/Drainageway Master Plans and FHAD’s completed since the 2004.

Table 2-11 – Watershed/Drainageway Master Plans Completed Since 2004

PROJECT	TYPE	YEAR COMPLETED
McMurdo Gulch Major Drainageway Master Plan & FHAD	Master Plan	2006
East Plum Creek Watershed Master Plan & FHAD	Master Plan	2009
Mitchell Gulch Watershed Master Plan & FHAD	Master Plan	2007
6400 East, West, & South Tributaries Major Drainageway Master Plan & FHAD	Master Plan	2008
Sellars Gulch Major Drainageway Master Plan & FHAD	Master Plan	2009
North / South Dawson Tributary Watershed Master Plan & FHAD	Master Plan	2010
Omni / Industrial / Westfield Tributary Watershed Master Plan & FHAD	Master Plan	2010
Lemon Gulch Watershed Master Plan (Completed by Douglas County)	Master Plan	2005

Table 2-12 summarizes Watershed/Drainageway Master Plans that are in progress in 2010 as this plan update is being drafted.

Table 2-12 – Watershed/Drainageway Master Plans In-Progress 2010

PROJECT	TYPE	STATUS
Hangmans Gulch / Parkview Tributary Watershed Master Plan & FHAD	Master Plan	Draft

Capital Improvement Projects



Omni Tributary—Before

Omni Tributary—After

Table 2-13 summarizes capital improvement projects completed since 2004.

Table 2-13 – Capital Improvement Projects Completed Since 2004

PROJECT	TYPE	YEAR COMPLETED	COST
Craig & Gould Storm Sewer & Centennial Park Flume	Storm Drainage Conveyance	2006	\$1,200,000
Omni Drainageway Stabilization	Stream Stabilization	2005	\$540,000
Sellars Gulch Stream Stabilization Phase I	Stream Stabilization	2007	\$480,000
South Gilbert Street Storm Sewer System/ Glovers Area Storm Sewer	Storm Drainage Conveyance	2006	\$450,000
Mitchell Street Storm Sewer System	Storm Drainage Conveyance	2008	\$315,000
Sellars Gulch Stream Stabilization Phase II	Stream Stabilization	2010	\$250,000
			\$3,235,000

Table 2-14 summarizes capital improvement projects that are in progress in 2010 as this plan update is being drafted.

Table 2-14 – Capital Improvement Projects In-Progress 2010

PROJECT	TYPE	STATUS	COST
McMurdo Gulch Stream Reclamation (Joint project with Cherry Creek Basin Water Quality Authority; Matching Funds of \$630,000)	Stream Stabilization	Construction	\$1,500,000
6400 East Tributary Stabilization	Stream Stabilization	Final Design / Permitting	\$450,000
6400 West Tributary Stabilization	Stream Stabilization	Design	\$600,000
East Plum Creek Parkway Drop Structure	Stream Stabilization	Project Feasibility	\$175,000
Hangman's Gulch Stream Stabilization (Joint Project with Town Parks and Recreation Project)	Stream Stabilization	Pre-Design	\$300,000
			\$3,025,000

3. Stormwater Master Plan Elements

NPDES Municipal Separate Storm Sewer System (MS4) Permit:

In 2002 the United States Environmental Protection Agency (EPA) implemented the National Pollutant Discharge Elimination System Phase II program to address stormwater quality in communities with populations between 10,000 and 100,000 people. Castle Rock is one of these “Phase II Communities”. As part of the program, the Town was required to obtain a Municipal Separate Storm Sewer System (MS4) permit through the State of Colorado Department of Public Health and Environment (CDPHE). This permit regulates the Town’s stormwater system for water quality and is issued in 5-yr. permit terms. The Town’s first permit Term was from 2002 – 2007 and focused on the development of a comprehensive stormwater quality program. The Town’s second permit term began in 2008 and will expire in 2013.

The MS4 permit program is divided into 6 minimum control measures (MCM’s) that address all aspects of stormwater quality in a community. The 6 MCM’s are as follows:



MCM 1 – Public Education and Outreach: MCM 1 includes all public outreach efforts implemented by the stormwater division to further educate the community on the importance of maintaining good stormwater quality. Required activities include public presentations, advertising campaigns, and informational brochures that address stormwater quality.

MCM 2 – Public

Involvement: MCM 2 addresses community involvement for improving stormwater quality in Castle Rock. Activities that are implemented include the annual “Spring up the Creek” event to remove trash and debris from local creeks and drainageways, and the Household Chemical round-up event which provides a venue for residents to properly dispose of household chemicals.



MCM 3 – Illicit

Discharge Detection and Elimination (IDDE):

MCM 3 addresses pollution in our waterways through illicit discharges. Examples include dumping of chemicals in storm drains, discharge of oils and other automotive chemicals on to the ground or street, and hazardous chemical releases as a result of vehicle accidents. The Town has an IDDE ordinance that makes this kind of willful discharge of chemicals a crime. The stormwater

division in conjunction with the fire department responds to illicit discharges within the Town.

MCM 4 – Construction Site Stormwater Runoff Control: MCM 4 addresses one of the most prevalent issues within the Town, which is the discharge of sediment and other construction debris to receiving waters.



This is due to the high rate of development and construction within the Town. MCM 4 addresses construction site runoff through the Grading Erosion & Sediment Control (GESC) Program, and the Drainage Erosion & Sediment Control (DESC) program. GESC addresses development and commercial construction, and DESC addresses single family home construction. Erosion control Best Management Practices (BMP's) are used to prevent sediment from leaving a construction site.

Common BMP's include silt fence, straw wattles, inlet protection, and erosion control blankets. The division has three inspectors that inspect construction sites to ensure compliance with the GESC and DESC regulations.

MCM 5 – Post Construction Water Quality: MCM 5 addresses stormwater

quality after a new development or commercial site is built. As part of new construction, all sites must incorporate some form of water quality pre-treatment prior to discharging to receiving waters. This is done to remove some of the pollutants that are commonly picked up in stormwater runoff such as trash, sediment, and oils. The treatment is most commonly done through a BMP such as a water quality pond. These ponds allow sediments to fall out of the water, collect trash, and allow wetland plants or grass to filter the water. After a period of time, the sediments and trash in the pond are removed and disposed of properly. These ponds are inspected at least once every five years, and maintained accordingly.



MCM 6 – Good Housekeeping: MCM 6 is specific to Town owned facilities and addresses stormwater runoff at those facilities. Each facility owned by the Town has a runoff control plan that describes the stormwater requirements for that facility. The plan also documents annual inspections of the site and is regularly updated by the facility contact person.

Stream Stabilization & Reclamation

As far back as the 1930's residents of Castle Rock have recognized the need to stabilize the steep and highly erosive drainageways in Town. The Civilian Conservation Corp.



(CCC) constructed several 6 foot high drop structures in McMurdo Gulch in what is now the Castle Oaks subdivision. These structures, constructed out of rhyolite and mortar have survived to this day and in turn preserved the upper reaches of McMurdo Gulch. Immediately downstream of these structures McMurdo gulch is experiencing severe erosion which is compromising the drainageway and associated overbank areas. This is the case throughout the Town and these stabilization projects comprise the bulk of all capital improvement projects sched-

uled through the build out of the Town and beyond. Without these improvements creeks and drainageways that continue to experience more and more development in their

watershed will degrade and ultimately damage the drainage corridors by becoming very deep narrow channels. Several areas in Town are already experiencing these effects as shown in the adjacent photograph of the 6400 West Tributary on the west edge of the Meadows subdivision.

Since the development of the adjacent residential homes the channel has continued to erode rapidly. In some areas the stream degradation is 15-20 feet deep. This erosion has already threatened adjacent properties and utilities. In 2008 an emer-



gency project was completed in this area to protect a sewer line and an adjacent property owner from loss. All developments moving forward are required to address instability and future erosion problems that will result from the discharging of developed flows into a natural drainageway. If the drainageway is contained within their property, they are responsible for the improvements. However creeks and drainages do not follow property lines. Therefore the effects of one development may materialize on another developer's property. In this case the Town collects development impact fees to cover the costs

of those improvements, and constructs those improvements at a later date. Stream stabilization is critical in the Town, because without it the narrowing of stream corridors due to development encroachment coupled with increased runoff and erosion due to pavement and rooftops will ultimately result in property damage to those adjacent properties.

FEMA Floodplain Management

The floodplain management program for the Town implements the requirements of the Federal Emergency Management Agency (FEMA) National Flood Insurance Program (NFIP). This program regulates all flood plains within the Town of Castle Rock. Currently there are approximately 27 miles of regulated floodplains within the Town.

The following major drainages have FEMA regulated floodplains.

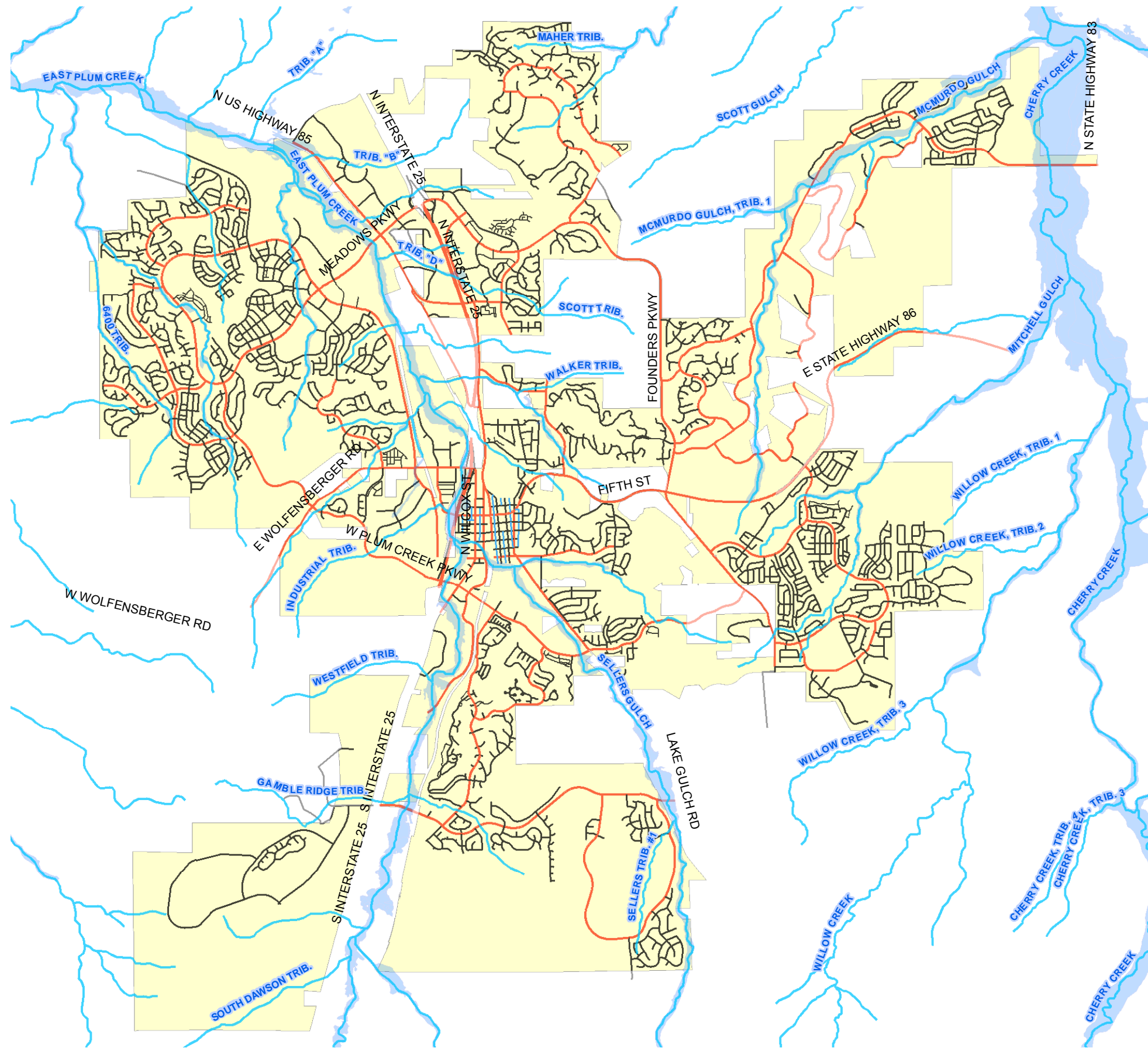
- **Plum Creek Basin:** East Plum Creek, Sellars Gulch, 6400 East Tributary, 6400 West Tributary, 6400 South Tributary, Omni Tributary, Industrial Tributary, Hangman's Gulch, Tributary B, Tributary D, and Tributary C
- **Cherry Creek Basin:** McMurdo Gulch, Lemon Gulch, Mitchell Gulch, and Cherry Creek

Figure 3-1 shows the Town's FEMA regulated floodplains.

In addition to the Town's FEMA regulated floodplains the Town regulates all 100-yr drainage way floodplains that are not FEMA regulated. These are generally smaller and have lower 100-yr discharge flow rates. The Town has also completed several Flood Hazard Area Delineations (FHAD's). A FHAD is a study that determines the 100-yr and 500-yr flow rates and water surfaces for a drainage way. These documents are used as regulatory guidance tools to guide development in the Town, and are periodically submitted to FEMA to update the Flood Insurance Rate Maps (FIRM's). The Town's most current FIRM's were adopted in September 2005 in a digital format. These maps are commonly referred to as DFIRM's.

The Town's Floodplain program also includes the review and local agency concurrence of all map revision documents that are submitted to FEMA when there is a DFIRM change. These generally include Letters of Map Revision (LOMR's), Conditional Letters of Map Revision (CLOMR's) and Letters of Map Amendment (LOMA's). A LOMA is a document that is prepared for individual property owners that may be inadvertently included in a 100-yr floodplain. The LOMA is prepared by the Town, and submitted to FEMA to remove the property from the floodplain.

All properties that are located within a 100-yr regulatory Floodplain are required to have flood insurance. The Town has one Floodplain Administrator that is responsible for the implementation of the floodplain program who is housed in the stormwater program.

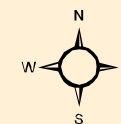
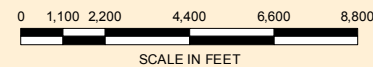


Legend

- Drainages
- FEMA Floodplain Areas
- Castle Rock Boundary



Plot Info: J:\GIS\Master Plan Maps\Stormwater\FEMA.mxd Printed: 11-10-10



Disclaimer: The data presented has been compiled from various sources, each of which introduces varying degrees of inaccuracies or inconsistencies. Such discrepancies in data are inherent and in supplying this product the Town of Castle Rock assumes no liability for its use or accuracy. Questions or comments regarding the cartographic composition of this map including, but not limited to, errors, omissions, corrections, and/or updates, should be directed to the Utilities Department, Town of Castle Rock, (720) 733-6087. Copyright 2010, Town of Castle Rock Utilities Mapping.

**Figure 3-1
FEMA Regulated
Floodplains**

Drainageway Master Planning & Flood Hazard Area Delineations (FHAD's)

The Town has completed several Drainage Basin Master Plans and FHAD's since the original 2004 URS Stormwater Master Plan. Drainage Basin Master Plans are critical to the planning of stormwater capital projects within the Town. FHAD's are used to manage and update floodplains on a periodic basis. Each Master Plan identifies improvements that are required to ensure a properly functioning stormwater system within that drainage sub-basin. The vast majority of all stormwater improvements that are required within the Town are stream stabilization/restoration projects due to the variable steep terrain, and the highly erosive soils in the drainageways.

The Town has completed the following Drainage Basin Master Plans & FHAD's:

- McMurdo Gulch
- Mitchell Gulch
- East Plum Creek
- Sellars Gulch
- 6400 East Tributary
- 6400 West Tributary
- 6400 South Tributary
- Lemon Gulch
- Industrial Tributary
- Omni Tributary
- Westfield Tributary
- North Dawson Tributary
- South Dawson Tributary

The following plans are nearing completion and are anticipated to be adopted in 2011:

- Hangman's Gulch
- Parkview Tributary

The following drainage basins are anticipated to be completed and adopted in 2012:

- Tributary C
- Tributary B
- Tributary D
- Douglas Lane Tributary
- Gamble Ridge Tributary

Each Master Plan identifies improvements required in a drainage basin and assigns them one of three priorities based on the type of improvement. Priority 1 improvements are those improvements that are needed as a result of existing development in the

Town and are funded through stormwater monthly charges. Priority 2 improvements are those improvements that are needed as a result of future development impacts and are funded through impact fees. The impact fees are divided between the East Plum Creek Basin, and the Cherry Creek Basin. Priority 3 improvements are those improvements that may or may not be needed in the future. Priority 3 improvements are theoretically needed based on computer modeling of a drainageway, but are only constructed if field observations warrant it. If these improvements are needed it is anticipated that they will not be required for several years, and will be funded by future rate revenue.

The priority 1 and priority 2 projects comprise the projects that are listed in the stormwater Capital Improvement program (CIP). The Town's 10-yr CIP can be found in Table 5-1 and the Town's build out CIP can be found in Table 5-2, and are further discussed in Section 5.

Each FHAD is used to manage the Town's floodplains, and when an update is completed by FEMA the FHAD information is incorporated into the new revised maps. The FHAD's show a much more accurate 100-yr and 500-yr floodplain than is shown on FEMA FIRM panels. This is because the flood profiles are generated using comprehensive up to date hydrologic information, and ground topography information that is accurate to within 7 inches. This information has been used by developers when they are developing adjacent to a drainageway, and by homeowners when completing LOMA's to remove their property from a floodplain.

4. Stormwater Modeling

While the Town of Castle Rock does not have a complete network model for its facilities, each drainageway master plan includes a comprehensive hydrologic model for the basin, as well as a hydraulic model for the drainageway. The hydrologic model is completed using the EPA's XPSWMM program, and generates the theoretical design storm runoff rates for the drainage basin. The typical design storm runoff rates that are calculated are for the 2-yr, 5-yr, 10-yr, 25-yr, 50-yr, 100-yr, and 500-yr storms. This information is then input into a US Army Corp of Engineers Hydrologic Engineering Center River Analysis System model, or more commonly known as a HEC-RAS model. This modeling software generates a water surface profile and velocities for a drainageway for each of the previously listed storm events. This information is then used to develop a 100-yr floodplain which is also regulated by FEMA as part of the NFIP described earlier. All the hydrology and hydraulic models are sub-basin specific and are all available to the development community as part of the specific Basin Master Plan.

Each new subdivision is also required to submit a storm sewer analysis model for all storm sewers, as well as a model for all stormwater conveyance channels. Programs that are generally used for these models are UDSEWER or StormCAD, and Flowmaster and Culvertmaster. All the models are independent and specific to each individual development.

5. Capital Improvement Program

This section summarizes all stormwater infrastructure capital improvements, listed by planning horizons, identified in this master planning effort including a brief description and the total cost expenditure for the given planning period. Cost estimates are based on 2010 dollars and were developed based on Watershed/Drainageway Master Plans completed within the Town in the previous 5 years. Specific cost estimates documentation can be found in each Sub-basin Watershed/Drainageway Master Plan. The location of each project is shown on the accompanying Figure 6-1 and Table 6-1 shows a more detailed cost accounting of each project by year.

The stormwater capital improvement plan is adjustable. Many times adjustments are made to allow a stormwater capital project to be completed in conjunction with another capital project proposed by another department within Town or when additional outside matching funds can be secured.

A major factor that impacts the stormwater program is the growth rate for new housing. When the original plan was developed in 2004 the Town was experiencing explosive growth in single family residential housing. At its peak the Town issued 1500 single family building permits in 2006. This resulted in the need for an aggressive Capital Improvement Program that could respond to the increase in homes and subsequent impervious area. From 2004 – 2010 the stormwater program has generally budgeted approximately 1.1 Million dollars per year for CIP projects. However since 2006 there has been a decline in growth in the Town and in 2009 the Town only issued 275 single family building permits. This decline has necessitated the reduction of annual CIP budget to approximately \$600,000 per year. This CIP budget reduction will allow the stormwater program to cash finance all projects while not significantly increasing rates. In fact in 2011 the stormwater rate is 10% lower than the 2010 rate.



- a. **2011 – 2015 Planning Horizon - Capital Improvement Projects:**
(See Figure 5-1 for project locations).

i. Stream Stabilization & Stream Bank Protection

East Plum Creek Stabilization Phase I – Cost \$600,000

This is the first of many project phases designed to address erosion and bank stabilization problems on East Plum Creek. This project includes the construction of drop structures and bank protection along East Plum Creek in the area north of Meadows parkway where several tributaries discharge into East Plum Creek. These tributaries are from highly developed areas and have caused significant erosion. These improvements are identified in the 2009 East Plum Creek Watershed Master Plan Preliminary Design Report. Grant funding is also being pursued through Nonpoint Source (NPS) Colorado.

East Plum Creek Stabilization Phase II – Cost \$500,000

This project phase includes the construction of drop structures and bank protection along East Plum Creek in the area of Town property south of the near the old Wastewater Treatment Plant property. These improvements are identified in the 2009 East Plum Creek Watershed Master Plan Preliminary Design Report.

Industrial Tributary Stabilization Phase I – Cost \$500,000

This project includes the construction of major drainageway improvements including channel reconstruction and drop structure installation in the area of Citadel Station. This area of Town has several industrial users and the existing channel is severely incised and unstable. These improvements are identified in the Omni, Industrial, and Westfield Tributaries Master Plan.

6400 South Tributary Stabilization Phase I – Cost \$400,000

This project addresses stream and bank erosion in the 6400 South Tributary in the Meadows subdivision. The specific area to be addressed is immediately east of Meadows Blvd downstream of the large Meadows Town Center regional detention pond. The drainageway in this area continues to erode as development occurs upstream in the basin placing several large Ponderosa pine trees in jeopardy. These improvements are identified in the 2010 6400 East, West, & South Tributaries Major Drainageway Master Plan.

Omni Tributary Stabilization Phase I – Cost \$250,000

This project addresses stream stabilization and conveyance issues on the Omni tributary east of the Red Hawk subdivision. The specific area to be addressed is just west of Prairie Hawk Drive upstream of a regional detention pond. These improvements are identified in the Draft Omni, Industrial, and Westfield Tributaries master plan currently in development.

East Plum Creek Stabilization Phase III – Cost \$500,000

This project phase includes the construction of drop structures and bank protection along East Plum Creek in the area north of phase I, just south of PCWA within the Town. As with phase I, several highly developed tributaries discharge to East Plum Creek in this section and have caused significant erosion. This is a continuation of the work already completed in East Plum Creek. These improvements are identified in the 2009 East Plum Creek Watershed Master Plan Preliminary Design Report.

ii. **Stormwater Conveyance**

None planned for this horizon.

b. **2016 – 2020 Planning Horizon - Capital Improvement Projects:**
(See Figure 5-1 for project locations)

i. **Stream Stabilization**



Tributary B Stabilization Phase I – Cost \$225,532

This project addresses areas of instability and erosion along Tributary B in the general area of the I-25/Meadows Pkwy interchange. This project was identified in the Town’s original 2004 Master Plan. Further refinement of the project scope will occur during the completion of a specific Drainage-way Master Plan for Tributary B in 2011.

McMurdo Gulch Stabilization Phase II – Cost \$500,000

This is the second project phase to address drainageway instability and erosion in McMurdo Gulch. This project is a continuation of the work started during the McMurdo Gulch Phase I project currently being completed in conjunction with the Cherry Creek Basin Water Quality Authority. The general area to be addressed is in McMurdo Gulch east of the Castle Oaks subdivision. These improvements are identified in the 2006 McMurdo Gulch Major Drainageway Master Plan.

East Plum Creek Stabilization Phase IV – Cost \$600,000

This project phase includes the construction of drop structures and bank protection along East Plum Creek in the area immediately south of Phase III, under Meadows Parkway, and is a continuation of the work already completed in East Plum Creek. These improvements are identified in the 2009 East Plum Creek Watershed Master Plan Preliminary Design Report.

East Plum Creek Stabilization Phase V – Approximate Cost \$500,000

This project phase includes the construction of drop structures and bank protection along East Plum Creek in the area from Plum Creek Parkway to downtown and is a continuation of the work in East Plum Creek. These improvements are identified in the 2009 East Plum Creek Watershed Master Plan Preliminary Design Report.

Omni Tributary Stabilization Phase II – Approximate Cost \$263,125

This project addresses stream stabilization and conveyance issues on the Omni Tributary east of the Red Hawk subdivision. The specific area to be addressed is on the tributary to Omni Tributary immediately west of Prairie Hawk Dr. These improvements are identified in the Draft Omni, Industrial, and Westfield Tributaries Master Plan currently in development.

ii. Stormwater Conveyance

Craig & Gould North Infrastructure Improvements – Cost \$1,200,000

Similar to the downtown area, this section of Town streets with inverted crowns that convey stormwater. New streets will be constructed with full curb & gutter & storm sewer systems. This work will be incorporated into an overall infrastructure improvement project to be coordinated with PW.

c. 2021 – Buildout Planning Horizon - Capital Improvement Projects:

Projects identified in this horizon are almost exclusively stream stabilization / reclamation projects. See Table 5-1 for build out projects.

Table 5-1

Drainage	Drainageway	Reach	Phase	TOTAL COST	DEVELOPER	TOWN COSTS		TOWN COSTS by CIP YEAR					
				\$ 60,812,148	\$ 7,991,011	\$ 52,821,136		\$ 52,821,136					
				Developer	Private costs	PRIORITY 1 (rates) \$ 26,885,335	PRIORITY 2 (impact fees) \$ 25,935,801	2011	2012	2013	2014	2015	
Plum Creek	East Plum Creek	5	1	\$ 600,000		\$ 360,000	\$ 240,000	\$ 600,000					
Plum Creek	East Plum Creek	4	2	\$ 500,000		\$ 340,000	\$ 160,000		\$ 500,000				
Plum Creek	Industrial Trib	Main	1	\$ 500,000		\$ 150,000	\$ 350,000			\$ 500,000			
Plum Creek	6400 Tributary	South	1	\$ 400,000		\$ 168,000	\$ 232,000				\$ 400,000		
Plum Creek	Omni Trib	Main	1	\$ 250,000		\$ 70,000	\$ 180,000				\$ 250,000		
Plum Creek	East Plum Creek	2	3	\$ 500,000		\$ 230,000	\$ 270,000					\$ 500,000	

Table 5-2

Drainage Basin	Drainageway	Reach	Phase	CIP Year	TOTAL COST	DEVELOPER CONTRIBUTION	TOWN COSTS			TOWN COSTS by CIP YEAR															
					\$ 60,812,148	\$ 7,991,011	\$ 52,821,136			\$ 52,821,136											\$ 50,071,136				
					Developer Contribution + Town Costs	Private costs incurred by future development	PRIORITY 1 (rates)	Year Total	PRIORITY 2 (impact fees)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021 - build-out					
					\$ 26,885,335		\$ 26,885,335				\$ 600,000	\$ 500,000	\$ 500,000	\$ 650,000	\$ 500,000	\$ 725,532	\$ 600,000	\$ 600,000	\$ 600,000	\$ 763,125	\$ 46,782,479				
Plum Creek	East Plum Creek	5	1	2011	\$ 600,000		\$ 360,000	\$ 600,000	\$ 1	\$ 240,000	\$ 600,000											\$ -			
Plum Creek	East Plum Creek	4	2	2012	\$ 500,000		\$ 340,000	\$ 500,000	\$ 1	\$ 160,000		\$ 500,000										\$ -			
Plum Creek	Industrial Trib	Main	1	2011	\$ 500,000		\$ 150,000	\$ 500,000	\$ 0	\$ 350,000			\$ 500,000									\$ -			
Plum Creek	6400 Tributary	South	1	2013	\$ 400,000		\$ 168,000	\$ 400,000	\$ 0	\$ 232,000				\$ 400,000								\$ -			
Plum Creek	Omni Trib	Main	1	2016	\$ 250,000		\$ 70,000	\$ 250,000	\$ 0	\$ 180,000				\$ 250,000								\$ -			
Plum Creek	East Plum Creek	2	3	2013	\$ 500,000		\$ 230,000	\$ 500,000	\$ 0	\$ 270,000				\$ 500,000								\$ -			
Plum Creek	Tributary B	Main	1	2013	\$ 225,532		\$ 106,000	\$ 225,532	\$ 0	\$ 119,532					\$ 225,532							\$ -			
Cherry Creek	McMurdo Gulch	Main	2	2014	\$ 500,000		\$ 405,000	\$ 500,000	\$ 1	\$ 95,000					\$ 500,000							\$ -			
Plum Creek	East Plum Creek	6	4	2014	\$ 600,000		\$ 228,000	\$ 600,000	\$ 0	\$ 372,000						\$ 600,000						\$ -			
Plum Creek	Craig & Gould North	n/a	1	2018	\$ 600,000		\$ 282,000	\$ 600,000	\$ 0	\$ 318,000							\$ 600,000					\$ -			
Plum Creek	Craig & Gould North	n/a	2	2019	\$ 600,000		\$ 282,000	\$ 600,000	\$ 0	\$ 318,000								\$ 600,000				\$ -			
Plum Creek	East Plum Creek	3	5	2017	\$ 500,000		\$ 320,000	\$ 500,000	\$ 1	\$ 180,000										\$ 500,000		\$ -			
Plum Creek	Omni Trib	Tributary	1	2016	\$ 263,125		\$ 263,125	\$ 263,125	\$ 1	\$ -										\$ 263,125		\$ -			

6. Operations & Maintenance

The Town has 3 full time operations and maintenance employees that are responsible for maintaining the Town's stormwater system infrastructure. Their activities include the following major work areas listed below. The stormwater program budgets \$65,000 annually for materials to complete these activities. Additional funds are also allocated from the stormwater contingency fund on a case by case basis. Funds may be allocated if a maintenance project is larger in scope than anticipated, or if there is a significant amount of site reclamation and revegetation.



Detention/Water Quality Ponds

There are approximately 290 detention/water quality ponds in Town. The Town maintains approximately 100 of these ponds while the rest are maintained by individual property owners or HOA's. Responsibilities include sediment cleanout, trickle channel cleaning, outlet structure cleaning, micro-pool cleanout, fore bay cleanout, vegetation/tree removal, riprap replacement, end section replacement, and side slope repair. Additionally, the Town's Stormwater Utility Division budgets approximately \$22,000 annually to sub-contract detention pond mowing activities.



Stormwater Outfalls

Stormwater outfalls include culvert or stormsewer outfalls into a major drainageway. Activities include sediment cleanout, vegetation/tree removal, riprap replacement, end section replacement, and toe wall construction. There are approximately 350 outfalls within the Town.

Proprietary BMP's

These are underground water quality treatment facilities such as vortexing manholes with a sediment chamber. Activities include sediment cleanout using the Town's Vac-truck, generally quarterly or semi-annually. There are approximately 10 proprietary BMP's throughout the Town.



Culverts and Ditches

This category includes cross culverts under roads and driveways, and roadside ditches. Activities include sediment cleanout, vegetation/tree removal, riprap replacement, end section replacement, and toe wall construction.



Channels

Includes minor and major drainageway channels. Activities include repair or reconstruction of existing drop structures, construction of channel stabilization and erosion protection using grouted boulders, and rip rap. There is approximately 54 miles of major drainageway with the Town.

Stormsewer Systems

Includes all Town owned stormsewer systems. Activities include sediment cleanout, inlet repair & cleaning, and pipe repair & cleaning. There is approximately 100 miles of stormsewer pipe throughout the Town.



Mosquito Abatement

Includes all Town owned stormwater facilities that potentially breed mosquitos during the spring and summer. The Town's Stormwater Utility Division budgets approximately \$25,000 annually to sub-contract this activity to a mosquito abatement contractor. Activities include trapping, chemical treatment, and fogging if necessary. Mosquito abatement covers approximately 34 square miles of the Town.

7. Financing

The Town of Castle Rock Utilities Department (Town), as part of its 2010 Utilities Rates and Fees Study, authorized Red Oak Consulting (Red Oak) to review its stormwater rates and development impact fees. The purpose of this study is to provide the Town with a thorough review of its stormwater rates and development impact fees and the underlying assumptions, and provide updated rates and fees for 2011 through 2015. This section contains summary information referenced directly from the Red Oak studies. For more detailed information on the 2010 rates and fees study please see those reports.

Rates

Revenue Requirements

Red Oak prepared a long-term financial plan to project the revenues required for each of the Town's utilities funds. The financial plans allow the integration of debt, accumulation/use of reserves, and other assumptions to finance the Town's utility system operations and maintenance (O&M) expenses and capital improvements for each respective utility. Using ratemaking terms, the financial plan calculates for each utility fund the annual user charge revenue requirements. The projection period developed for each utility financial plan was driven by the length of the capital improvement program (CIP). The projection period for the stormwater utility is 50 Years. Revenue requirements and capital improvement programs are presented only for the 2011 through 2015 study period.

Stormwater utility fees are based on the Town's projected revenue requirements to operate and maintain the Town's stormwater system, along with the CIP. The Town's 2011 total stormwater revenue required from fees is estimated to be \$1.9 million. Red Oak reviewed the existing assumptions used for determining the stormwater monthly utility fee. Red Oak was asked to verify the assumptions used in determining the fee and update as necessary. The primary assumption in determining stormwater utility fees is the definition of an SFE. The Town's 2010 fees are based on one SFE being equal to 2,458 square feet (sq. ft.) of impervious area. For non-residential accounts, all properties were assumed to be 70 percent impervious. Both assumptions above have been updated based on current data. One SFE has been revised to equal 3,255 sq. ft. The average percent imperviousness for multi-family and other non-residential properties was assumed to be 80 percent. Given these updates to the basic assumptions in determining stormwater utility fees and the 2011 revenue requirements for the stormwater utility, Red Oak calculated the following fees:

**Table 7-1
Proposed 2011 Stormwater Utility Fees**

Monthly Stormwater Fee		
All Customers, per Single Family Equivalent (SFE)		\$6.08
SFE Assignment		
Customer Class Impervious	Sq. Ft.	SFE
Single Family Attached & Detached	3,255	1
Non-Single Family (Multi Family & Commercial)	Parcel size times 80% imperviousness divided by 3,255 impervious sq. ft. per SFE = # of SFEs	

Development Impact Fees

Methodology- Incremental Cost (Improvement) Approach

The nature of stormwater utility capital improvements is such that only the forward looking improvements are assumed to be available to provide runoff capacity for new customers. Existing structures and improvements are assumed to have no available capacity for new development. The incremental cost approach is most appropriate when the existing system is at or near its maximum capacity and new customers cannot be accommodated absent significant investment in facilities. Under the incremental cost approach, new customers pay a proportionate share of the expansion-related costs of the new facilities. The SDF is calculated using capital improvement plans (CIPs) developed in the Town’s master planning process. The incremental cost approach for calculating stormwater development impact fees is therefore followed. The incremental cost approach followed for the stormwater development impact fees also complies with CRS 29-20-104.5.

Existing and Proposed SDFs

Stormwater Development Impact Fees

Unlike the water, water resources, and wastewater SDFs, stormwater development impact fees are assessed on the basis of impervious area by development type. The costs of stormwater capital improvements for new development are proportioned across the planned developments by type:

- Single-family detached
- Single-family attached
- Multi-family
- Commercial/Industrial

The stormwater fees are also bifurcated for properties located within the Cherry Creek Basin and the Plum Creek Basin. Primary drivers to changes in the stormwater development impact fee include:

1. Revisions to the stormwater Master Plan
2. Updates to allocations of costs across new development and existing development
3. Updates to the number of developable acres by land use type
4. Updates to the number of units per acre
5. Revisions to the assumptions on imperviousness by development type

Results of the stormwater development impact fee analysis are presented below. Units for Commercial/Industrial development are per 1,000 sq. ft. of building space.

Table 7-2

EXISTING AND PROPOSED STORMWATER DEVELOPMENT IMPACT FEES		
Cherry Creek		
	Per Unit Current 2010 Fee	Proposed 2011 Fee
Single-Family Detached	\$368	\$451
Single-Family Attached	\$158	\$301
Multifamily	\$106	\$273
Commercial/ Industrial	\$161	\$203
Plum Creek		
	Per Unit Current 2010 Fee	Proposed 2011 Fee
Single-Family Detached	\$425	\$692
Single-Family Attached	\$183	\$463
Multifamily	\$122	\$419
Commercial/ Industrial	\$201	\$312

Projected SDFs for 2011 through 2015

Throughout this SDF study, Red Oak revised underlying assumptions and recalculated the fees to reflect current conditions in the Town. Costs for capital improvements were maintained at 2010 dollars.

Table 7-3

PROPOSED STORMWATER DIF IMPLEMENTATION SCHEDULE					
Cherry Creek Basin					
	Proposed 2011 SDF	Proposed 2012 SDF	Proposed 2013 SDF	Proposed 2014 SDF	Proposed 2015 SDF
Single Family Detached	\$451	\$466	\$482	\$498	\$514
Single Family Attached	\$301	\$311	\$322	\$332	\$343
Multifamily	\$273	\$282	\$292	\$301	\$311
Commercial (Retail/ Office)	\$203	\$210	\$217	\$224	\$232
Plum Creek Basin					
	Proposed 2011 SDF	Proposed 2012 SDF	Proposed 2013 SDF	Proposed 2014 SDF	Proposed 2015 SDF
Single Family Detached	\$692	\$715	\$739	\$763	\$789
Single Family Attached	\$463	\$479	\$495	\$511	\$528
Multifamily	\$419	\$433	\$448	\$462	\$478
Commercial (Retail/ Office)	\$312	\$323	\$333	\$344	\$356

References

CH2M Hill Inc., *2007 Mitchell Gulch Watershed Master Plan Preliminary Design Report*

CH2M Hill Inc., *2009 East Plum Creek Watershed Master Plan Preliminary Design Report*

CH2M Hill Inc., *2010 North South Dawson Watershed Master Plan Preliminary Design Report*

CH2M Hill Inc., *2010 Omni, Industrial, Westfield Watershed Master Plan Preliminary Design Report*

Moser & Associates Engineering, *2010 6400 East, West, & South Tributaries Major Drainageway Master Plan*

PBS&J, *2006 McMurdo Gulch Major Drainageway Master Plan*

PBS&J, *2009 Sellars Gulch Major Drainageway Master Plan*

Red Oak Consulting, *2010 Utilities Rates and Fees Study – Vol. 1 of 2 Rates*

Red Oak Consulting, *2010 Utilities Rates and Fees Study – Vol. 2 of 2 System Development Fees*

URS Corporation, *2004 Town of Castle Rock Stormwater Master Plan*

Appendices

- Appendix A MS4 Program Description
- Appendix B Floodplain Ordinance

Appendix A—MS4 Program Description

CDPS MS4 Phase II

STORMWATER MANAGEMENT

PROGRAM DESCRIPTIONS

FOR THE TOWN OF CASTLE ROCK

March 2008–March 2013
Due to WQCD by June 10, 2008

Agency Name	Town of Castle Rock
Permit Certification Numbers	COR-080012
MS4 Location Description <i>(most permit certifications will cover a single city or county)</i>	City(s) Permitted: Town of Castle Rock County Permitted: n/a Non-Standard MS4(s) Permitted (including location descriptions): n/a
Map	Appendix A
Discontinued Elements	Appendix B
CDPS Program Descriptions	Attached
Program Implementation Area (Counties only)	<input type="checkbox"/> Permitted Area <input type="checkbox"/> Entire Jurisdiction
Joint Submittal	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes

Certification: The following certification must be signed by the Legally Responsible Person. The signer must be either a principal executive officer, ranking elected official or other duly authorized employee.

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Name (printed): Ron R. Redd, P.E.

Title: Utilities Director

Signature: Ron R. Redd

Date: 6/10/08

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Instructions

Overall Program Perspective

MCM1: Public Education & Outreach

MCM 2: Public Participation/Involvement

MCM 3: Illicit Discharge Detection & Elimination

MCM 4: Construction Site Runoff Control

MCM 5: Post-Construction Stormwater Management

MCM 6: Pollution Prevention/Good Housekeeping for Municipal Operations

CDPS Stormwater Management Program Descriptions Instructions

A. Applicability

This template is applicable for all permittees covered under the MS4 general permits COR-080000 and COR-090000. This template is **not** applicable to non-standard MS4s permitted under the COR-070000 general permit.

B. Filling out the Template

This template is intended to be filled out electronically, with additional lines added to the sections as descriptions are entered.

C. Submitting the Program Description

A complete program description, including the original signed certification on page 2, must be submitted to the Water Quality Control Division by **June 10, 2008**.

The submittal must include an original signature. E-mailed or faxed copies will **not** be accepted.

D. Completeness

The form must be completed accurately and in its entirety, or it will be deemed incomplete. This template is intended to be a summary of all of the content for the CDPS Stormwater Management Program Submittal required by Part I.A.6 of the MS4 general permits, COR-080000 and COR-090000. The descriptions provided must be detailed enough for the Water Quality Control Division to determine the permittee's general strategy for complying with the required items in each of the six CDPS Stormwater Management Program Minimum Control Measures (Parts I.B.1-6 of the general permits).

E. Cited Permit Requirements

Subsection B of this template for each of the six Minimum Control Measures includes citations of the specific permit requirements. Where permit requirements have been significantly modified from the previous versions of the general permits, the new language is identified in the template as either a "Clarified" or "New" permit requirement. Refer to Part II.H of the permit rationales for additional information on these changes.

ALL NEW PROGRAM ACTIVITIES ARE IDENTIFIED IN BOLD.

ALL DISCONTINUED ITEMS ARE IN APPENDIX B

Town of Castle Rock	Overall CDPS Stormwater Management Program Perspective	STORMWATER DISCHARGES ASSOCIATED WITH MS4s Program Descriptions 2008–2013
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Summary description of the overall water quality concerns, priorities, and goals specific to the permittee that were considered in the development of the CDPS Stormwater Management Program:

Provide information on conditions that were considered in developing your overall program. (Examples: water quality impairments or concerns, other watershed concerns, community specific pollutant concerns)

<i>Town of Castle Rock Stormwater Program Considerations</i>
<p>The Town of Castle Rock’s stormwater management program contains components that have been developed and implemented over the past five years (first permit term) with the ultimate goal of reducing the amount of pollutants attributable to urban stormwater runoff (sediment, nutrients, trash, bacteria, and etc.) introduced to receiving waters from the Town’s Municipal Separate Storm Sewer System (MS4) to the maximum extent practicable (MEP). The Town has prioritized components of the stormwater management program with the goal of expending more of the Town’s limited resources to address Town-specific concerns, while still implementing all programs required by the State for coverage under the CDPS General Permit for Stormwater Discharges Associated with the Cherry Creek Reservoir Drainage Basin MS4s [State Permit Number COR-080000].</p> <p>As an integral part of Town of Castle Rock’s vision of providing its citizens with the highest quality services at the best value, the Stormwater Program priorities are:</p> <ul style="list-style-type: none"> • Safeguard the public welfare through the proper collection, conveyance, and storage of stormwater runoff in a non-damaging and non-life threatening manner. • Ensure compliance with all applicable water quality regulations related to stormwater runoff to the maximum extent practicable. • Ensure that all Town municipal separate storm sewer system (MS4) facilities are functioning and maintained to the maximum extent practicable. • Protect the overall water quality of the Town’s water resources. • Provide healthy and diverse natural habitats for flora and fauna in applicable drainageways and Town open spaces. • Continue to implement programs to control sediment from construction activities, nutrient loading from urban areas, and phosphorus in the Cherry Creek Reservoir basin.

Town of Castle Rock	PUBLIC EDUCATION & OUTREACH	STORMWATER DISCHARGES ASSOCIATED WITH MS4s Program Descriptions 2008–2013
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A. Program Perspective: The goal of the Public Education and Outreach Program is to increase public knowledge of local water quality problems caused by urban runoff in order to maintain public support for local stormwater quality programs. This support ranges from individuals changing their daily actions to community backing for all stormwater program elements. The program should take into account pollutants commonly associated with the urban environment.

B. Permit Requirements

*The permittee must implement a public education program in an effort to promote behavior change by the public to reduce water quality impacts associated with pollutants in stormwater runoff and illicit discharges that includes: **(Clarified permit requirement)***

- 1) *targeting specific pollutants and pollutant sources determined by the permittee to be impacting, or to have the potential to impact, the beneficial uses of receiving waters;*
- 2) *conducting outreach activities about the impacts of stormwater discharges on water bodies and the steps that the public can take to reduce pollutants in stormwater runoff; and **(Clarified permit requirement)***
- 3) *informing businesses and the general public of the municipality’s prohibitions against, and/or the water quality impacts associated with, illegal discharges and improper disposal of waste.*

C. Program Elements: By using existing, ongoing program elements to meet the permit requirements, the MS4 is committed to continuing each of these program elements. Any changes would require use of the program modification process as outlined in Part I.E.2. of the permit.

Address the existing program elements, including those developed during the first permit term. If elements developed during the first term will be discontinued in the second term, include a brief summary of the discontinued element(s). For “Implementation Year,” provide the year the element will be implemented, or list as “Ongoing.”

1. **Forming Partnerships**—List and briefly describe any partnerships and memberships and describe their relevance. (Examples: Colorado Stormwater Council, Project Wet, Keep It Clean partnership, local watershed organizations, etc.).

	Public Education Program Element - Partnerships <i>List each program element, briefly describe. Provide the year(s) for implementation or state “ongoing” for currently implemented programs.</i>	Implementation Year or “Ongoing”
1.a	Douglas County Stormwater Cooperative. The group acts as a forum for MS4 permit holders in Douglas County to work together to develop tools to help implement successful programs.	Ongoing
1.b	Cherry Creek Stewardship Partners. The partners promote active stewardship in the	Ongoing

	Cherry Creek watershed through regional education and outreach programs including teacher training through Project WET (Water Education for Teachers).	
1.c	Cherry Creek Basin Water Quality Authority (CCBWQA). The CCBWQA preserves water quality in the Cherry Creek Reservoir watershed by sponsoring BMPs in the watershed and offering tools and resources to members.	Ongoing
1.d	Urban Drainage and Flood Control District (UDFCD) Phase II Group. The UDFCD group is a forum for MS4 permit holders in the surrounding district to work together to develop tools to help implement successful programs. UDFCD also provides guidance with master plans, capital improvement programs, and maintenance programs.	Ongoing
1.e	Chatfield Watershed Authority. The authority promotes the protection of water quality in the Chatfield Watershed for recreation, fisheries, drinking water supplies, and other beneficial uses.	Ongoing
1.f	Douglas County Household Chemical Roundup Committee. The committee, led by Tri-county Health Department, manages the countywide disposal service and tailors the program to meet the needs of the public.	Ongoing

2. Using Educational Materials and Strategies—List and briefly describe your programs/methods for distributing educational materials or conducting outreach activities that have the goal of promoting changes in behavior to protect water quality.

	Public Education Program Element—Educational Materials and Strategies <i>List each program element, briefly describe. Provide the year(s) for implementation or state “ongoing” for currently implemented programs.</i>	Implementation Year or “Ongoing”
2.a	Continue to work with local and regional partnerships	Ongoing
2.b	Continue to educate each target audience with a variety of materials including the following: <ul style="list-style-type: none"> Residential community—web site, a minimum of 25 total awareness advertisements in local newspapers during the 5-year permit term (Note: the same advertisement placed in 5 different newspapers counts as 5 of the 25 advertisements required for the residential community), interactive stormwater models and tributary signage (not committing to new signage) Commercial/business sector—carpet cleaning and paint disposal videos on DC8, a minimum of 25 total awareness advertisements in local newspapers during the 5-year permit term (Note: the same advertisement placed in 5 different newspapers counts as 5 of the 25 advertisements required for the residential community) Development community and construction sector—web site, Grading, Erosion and Sediment Control (GESC) manual, predevelopment and preconstruction meetings, and site inspections Other Phase II permittees—Douglas County Stormwater Cooperative, Colorado Stormwater Council, Urban Drainage and Flood Control District (UDFCD) Phase II Group 	Ongoing
2.c	Continue outreach through the mass media. The Town has developed (in partnership with the Douglas County Stormwater Cooperative) videos for carpet cleaning and paint disposal, which will continue to run monthly on DC8. The Town (in partnership with the Douglas County Stormwater Cooperative) will consider developing additional videos as necessary. The Town will continue to develop (in partnership with the Douglas County Stormwater Cooperative) and place awareness advertisements in applicable newspapers.	Ongoing
2.d	Continue to offer a Stormwater and Spill Hotline	Ongoing
2.e	Continue to maintain tributary signage (not committing to new signage)	Ongoing

2.f	Continue to present “Traveling Stormwater Management Booth” at applicable public functions (this is an existing program element, but was added to this section for clarification).	Ongoing
2.g	Work with the Douglas County Stormwater Cooperative partners to develop and distribute additional outreach materials, as applicable and as resources allow.	Ongoing

3. Signage and Stenciling—List and briefly describe any outreach incorporating signage, inlet stenciling, etc. As applicable, include in the description any commitments to maintain and/or replace signage and stenciling as necessary, including those implemented under the previous permit.

	Public Education Program Element—Signage and Stenciling <i>List each program element, briefly describe. Provide the year(s) for implementation or state “ongoing” for currently implemented programs.</i>	Implementation Year or “Ongoing”
3.a	Continue to maintain tributary signage on high priority drainageways within the Town (not committing to new signage).	Ongoing
3.b	Continue storm drain stenciling program - To date, decals have not been an effective use of stormwater resources and funding. However, the Town has incorporated permanent storm drain marking requirements in the storm drainage and technical criteria manual for incorporation in new residential developments and will continue to investigate opportunities to implement more permanent stenciling/marketing methods in high priority areas as resources allow.	Ongoing

4. Reaching Diverse Audiences—Describe how the program elements listed in the tables in Items 1, 2, and 3, above, are providing outreach to diverse audiences. Provide in your descriptions cross-references to the applicable program elements listed in the tables. Examples: using bilingual materials, free household chemical collection, events are free and open to public, information and materials distributed are free and readily available, etc.

<i>Program Description</i>	
<ul style="list-style-type: none"> • The Town’s public education and outreach program includes educational materials as listed in 2.b above reaching a variety of target audiences by utilizing the internet, local newspapers, Town newsletters, local television, public events, and classrooms. • The Town offers most of their materials free of charge and materials are readily available on the web site. • The Town, in conjunction with the Tri-County Health Department, offers a household hazardous waste collection program for a nominal fee. • At public events and when the Town is invited to present stormwater topics in local classrooms, stormwater activity books are distributed to children and students. • The storm drain stenciling program as mentioned in 3.b above includes English and Spanish descriptors on the educational door hangers. 	

5. Illicit Discharge Education to Businesses and the Public—Describe how the program elements listed in the tables in Items 1, 2, and 3, above, inform businesses and the general public of impacts associated with illegal discharges and improper disposal of waste. Provide in your descriptions cross-references to the applicable program elements listed in the tables. Examples: distributing educational materials, maintaining a web site with applicable information, offering household chemical curbside pickup service, coordination with Industrial Pretreatment Program

for business inspections, publishing or distributing information targeting specific business sectors, etc.

<i>Program Description</i>
<p>The Town informs businesses and the general public of the impacts of illegal discharges and improper disposal of waste through the following elements:</p> <ul style="list-style-type: none">• Stormwater brochures and fact sheets are made available at the Utilities Department counter.• Videos that air on DC8—carpet cleaning and paint disposal• Awareness advertisements, developed with the Douglas County Stormwater Cooperative, published in local newspapers and in Town newsletters.• Stormwater page on the web site• Household hazardous materials and waste collection program• Illicit discharge investigations and follow up including distribution of educational door hangers when applicable.

6. Additional Requirements-Cherry Creek Reservoir Basin discharges (COR-080000 only)— Describe how the program elements listed in the tables in Items 1, 2, and 3, meet the additional education requirements for discharges to the Cherry Creek Reservoir Basin in Part I.B.1(a)(4) of COR-080000. Provide in your descriptions cross-references to the applicable program elements listed in the tables. Specifically describe how the program elements result in the distribution of educational materials or equivalent outreach that address pollutant sources that have a significant potential to contribute phosphorus and nitrogen loads to State waters at a rate that could result in, or threaten to result in, exceedance of the chlorophyll *a* standard in Cherry Creek Reservoir. The outreach should focus on residential, industrial, agricultural, and/or commercial sources within the MS4.

<i>Program Description</i>
<p>The Town informs a variety of target audiences that have the potential to contribute phosphorus and nitrogen loads to state water in the Cherry Creek reservoir basin. Examples include the following:</p> <ul style="list-style-type: none">• Residential community—web site, brochure, awareness advertisements in local newspapers, household hazardous materials and waste collection program, illicit discharge investigations and follow up.• Commercial/business sector—illicit discharge investigations and follow up, and newspaper awareness advertisements in newspapers and newsletter.• Development community and construction sector—web site, GESC manual, site inspections, illicit discharge investigations and follow up, and awareness advertisements in local newspapers. <p>The Cherry Creek Stewardship Partners distributes educational materials and organizes events that educate participants on pollutant sources, such as nitrogen and phosphorus. The Town is unable to commit to a certain number of outreach materials developed or events conducted because Cherry Creek Stewardship Partners organizes those activities and their budget varies. The Town will, however, continue to support the partners, both financially and technically.</p> <p>The Town does not have many industrial facilities and agricultural sources, so the Town has determined that they do not present a significant potential source of chlorophyll <i>a</i>.</p>

D. Measurable Goals

Inclusion of measurable goals should not be necessary, as the elements described in Part C, above, should constitute full program implementation and a commitment to continue these elements. **See above tables for new activities in bold text and the associated measureable goals.**

Town of Castle Rock	PUBLIC PARTICIPATION/ INVOLVMENT	STORMWATER DISCHARGES ASSOCIATED WITH MS4s Program Descriptions 2008–2013
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II. PUBLIC PARTICIPATION/INVOLVMENT

A. Program Perspective

Public participation/involvement is often discussed in the context of the public education measure because they share a common goal—reaching out to citizens to improve awareness and achieve program compliance. The distinction between the two programs is that public participation/involvement provides a conduit for citizens to participate in the development and implementation of the publicly funded stormwater program.

B. Permit Requirements

Public involvement/participation. The permittee must implement a public involvement program as follows:

- 1) *The permittee must comply with the State and local public notice requirements when implementing the CDPS Stormwater Management Programs required under this permit. Notice of all public hearings should be published in a community publication or newspaper of general circulation, to provide opportunities for public involvement that reach a majority of citizens through the notification process.*
- 2) *The permittee must provide a mechanism and process to allow the public to review and provide input on the CDPS Stormwater Management Program.*

C. Program Elements: By using existing, ongoing program elements to meet the permit requirements, the MS4 is committed to continuing each of these program elements. Any changes would require the use of the program modification process as outlined in Part I.E.2 of the permit.

Address the existing program elements, including those developed during the first permit term. If elements developed during the first term will be discontinued in the second term, include a brief summary of the discontinued element(s). For “Implementation Year,” provide the year the element will be implemented, or list as “Ongoing.”

1. Public Notices—List your local public notice requirements.

<i>Program Description</i>
The Town complies with all legally required public notice procedures for activities that involve or impact the public. Section 7-3 of the Town of Castle Rock Municipal Code Charter outlines procedures for adoption and effective dates of Ordinances including public notice requirements.

2. Mechanism and Processes for Public Involvement/Feedback—List and briefly describe your method(s) of publicizing contact information and directing inquires to appropriate staff. Examples are web site, brochure, phone book listing, internal phone lists, hot line, etc.

	Public Involvement/Participation Program Element—Public Feedback <i>List each program element, briefly describe. Provide the year(s) for implementation or state “ongoing” for currently implemented programs.</i>	Implementation Year or “Ongoing”
2.a	Continue public notice procedures for applicable activities. Public notification procedures generally include one or more uses of the following: placing an ad in the local newspaper, placing an article in ‘Town Talk’ (a newsletter included with utility bills), hosting public meetings and advertising on the Town’s website.	Ongoing
2.b	Continue local and regional partnerships. The partnerships will be with those listed in the public education and outreach section.	Ongoing
2.c	Continue to offer a household hazardous materials and waste collection program.	Ongoing
2.d	Continue to implement a volunteer stream clean up program.	Ongoing
2.e	Continue to maintain the web site.	Ongoing
2.f	Continue to advertise a stormwater and spill hotline on applicable outreach material and web site. Hotline calls are tracked in a central database system and directed to appropriate staff for consideration (This is an existing program element, but was added to this section for clarification).	Ongoing

D. Measurable Goals

Inclusion of measurable goals should not be necessary, as the elements described in Part C, above, should constitute full program implementation and a commitment to continue these elements.

See above tables for new activities in bold text and the associated measureable goals.

Town of Castle Rock	ILLICIT DISCHARGE DETECTION AND ELIMINATION	STORMWATER DISCHARGES ASSOCIATED WITH MS4s Program Descriptions 2008–2013
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A. Program Perspective

The goal of the Illicit Discharge Detection and Elimination Program is, to the maximum extent practicable, to reduce the frequency and environmental impact of illicit discharges in which pollutants are intentionally or accidentally discharged into the storm sewer system.

B. Permit Requirements

The permittee must develop, implement and enforce a program to detect and eliminate illicit discharges (as defined at 61.2) into the permittee’s MS4. Illicit discharges do not include discharges or flows from fire fighting activities, or other activities specifically authorized by a separate CDPS permit.

The permittee must:

- 1) *Develop and maintain a current storm sewer system map, showing the location of all municipal storm sewer outfalls and the names and locations of all state waters that receive discharges from those outfalls.*
- 2) *To the extent allowable under State or local law, effectively prohibit, through ordinance or other regulatory mechanism, illicit discharges (except those identified in subparagraph 5 and 6 of this section) into the storm sewer system, and implement appropriate enforcement procedures and actions. (Clarified permit requirement)*
- 3) *Develop, implement, and document a plan to detect and address non-stormwater discharges, including illicit discharges and illegal dumping, to the system. The plan must include the following three components: procedures for locating priority areas likely to have illicit discharges, including areas with higher likelihood of illicit connections; procedures for tracing the source of an illicit discharge; and procedures for removing the source of the discharge.*
- 4) *Develop and implement a program to train municipal staff to recognize and appropriately respond to illicit discharges observed during typical duties. The program must address who will be likely to make such observations and therefore receive training, and how staff will report observed suspected illicit discharges. (New permit requirement)*
 - i) ***Specific Deadline for Renewal Permittees:** Renewal Permittees must comply with the requirement of subparagraph (4) by no later than December 31, 2009.*
- 5) *Address the following categories of non-stormwater discharges or flows (i.e., illicit discharges) only if the permittee identifies them as significant contributors of pollutants to the permittee’s MS4: landscape irrigation, lawn watering, diverted stream flows, irrigation return flow, rising ground waters, uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20)),*

uncontaminated pumped ground water, springs, flows from riparian habitats and wetlands, water line flushing, discharges from potable water sources, foundation drains, air conditioning condensation, water from crawl space pumps, footing drains, individual residential car washing, dechlorinated swimming pool discharges, and water incidental to street sweeping (including associated side walks and medians) and that is not associated with construction.
(Clarified permit requirement)

The permittee may also develop a list of occasional incidental non-stormwater discharges similar to those in the above paragraph, (e.g., non-commercial or charity car washes, etc.) that will not be addressed as illicit discharges. These non-stormwater discharges must not be reasonably expected (based on information available to the permittee) to be significant sources of pollutants to the MS4, because of either the nature of the discharges or conditions the permittee has established for allowing these discharges to the MS4 (e.g., a charity car wash with appropriate controls on frequency, proximity to sensitive water bodies, BMPs, etc.). The permittee must document in their program any local controls or conditions placed on the discharges. The permittee must include a provision prohibiting any individual non-stormwater discharge that is determined to be contributing significant amounts of pollutants to the MS4.

- 6) *The following sources are excluded from the prohibition against non-stormwater discharges and the requirements of subsections (2) and (3) above:*
 - i) *Discharges resulting from emergency fire fighting activities. Such discharges are specifically authorized under this permit (see Part I.A.2).*
 - ii) *Discharges specifically authorized by a separate CDPS permit.*

C. Program Elements: By using existing, ongoing program elements to meet the permit requirements, the MS4 is committed to continuing each of these program elements. Any changes would require use of the program modification process as outlined in Part I.E.2 of the permit.

Address the existing program elements, including those developed during the first permit term. If elements developed during the first term will be discontinued in the second term, include a brief summary of the discontinued element(s).

- 1. Outfall map—Describe the status of your outfall map; i.e., has it been completed as required by the previous permit? Briefly describe the process that has been implemented for updates to the map when new outfalls are constructed.

<i>Program Description</i>
The Town has mapped all outfalls within the permit boundary. Record drawings showing all new outfalls are required prior to initial acceptance of all public improvement projects. Additionally, staff are trained to identify new outfalls in the field during routine annual outfall inspections. Updates are made within a reasonable timeframe when new outfalls are constructed.

- 2. Regulatory mechanism—List all ordinances (or other applicable controls) used to implement the Illicit Discharge Detection and Elimination program. For all ordinances/controls, provide the title, date of adoption/revision, and a brief description of the authority granted (e.g., provides enforcement authority, inspection authority, etc.).

<i>Program Description</i>
The Town uses the Illicit Discharge and Connection Ordinance 2005-30, adopted on May 24, 2005, for

implementation of the IDDE Program. [Illicit Discharge and Connection, MC4 Section 4.03]

From section 4.03.010 of the Town of Castle Rock Municipal Code, the purpose of this ordinance is to provide for the health, safety, and general welfare of the citizens of the Town of Castle Rock through the regulation of non-storm water discharges to the storm drainage system to the maximum extent practicable as required by federal and state law. This ordinance establishes methods for controlling the introduction of pollutants into the municipal separate storm sewer system (MS4) in order to comply with requirements of the National Pollutant Discharge Elimination System (NPDES) permit process. The objectives of this ordinance are:

- (1) To regulate the contribution of pollutants to the municipal separate storm sewer system (MS4) by stormwater discharges by any user;
- (2) To prohibit illicit connections and discharges to the MS4;
- (3) To establish legal authority to carry out all inspection, surveillance, monitoring and enforcement procedures necessary to ensure compliance with this ordinance.

The Town's *Illicit Discharge Detection and Elimination Manual* (June 2004 and as amended) describes the program, prohibited illicit discharges, and procedures for how to respond to illicit discharge complaints and remove the source of an illicit discharge.

3. Illicit Discharge Detection and Elimination Plan—Briefly describe plans and procedures in place for the following required actions:
 - Locating priority areas likely to have illicit discharges
 - Tracing the source of illicit discharges
 - Removing the source of illicit discharges

Program Description

The Town has an *Illicit Discharge Detection and Elimination Manual* (June 2004 and as amended). The manual lists the priority areas and procedures for tracing and tracking an illicit discharge source and removing an illicit discharge.

Locating Priority areas

The Town uses the following guidelines when identifying priority areas:

- Commercial/industrial areas;
- Older areas of the Town;
- Areas where there have been repeated complaints; and
- Locations identified from ambient water quality sampling data as needed.

Tracing the source of illicit discharges

The IDDE Manual identifies several ways to trace the source of illicit discharges including the use of maps in currently mapped MS4 areas, field data collection and incorporation of unmapped MS4 areas that receive an illicit discharge and other tracing options including manhole observation, video inspection, smoke testing, dye testing, aerial infrared, thermal photography, and tracking illegal dumping. The Town has and will continue to use Global Positioning System (GPS) units to map the entire MS4 and incorporate the data into the Town's GIS System.

The Town will continue to develop a comprehensive MS4 map in the new permit term, as resources are available.

Removing the source of illicit discharges

The IDDE Manual identifies three types of actions that can be taken to remove the source of illicit discharges—compliance assistance and enforcement for illegal connections to homes and businesses, proper construction and maintenance of MS4s, and responding to and preventing illegal dumping.

4. Staff Education—List program(s) to educate staff and contractors in the field on observing, reporting, and responding to illicit discharges. You may provide a cross-reference to the Municipal Operations program if this program element is covered there. Briefly describe the type (e.g., class room, web-based, briefings, etc) and frequency of training program(s) conducted. If training has not been fully implemented, provide a measurable goal in Part D, below.

Program Description
Illicit discharges are typically covered in the annual employee stormwater training listed under the pollution prevention/good housekeeping program. The Town trains appropriate field employees on the IDDE manual and the applicable procedures for observing, reporting and responding to illicit discharges.

D. Measurable Goals

Measurable Goals are required for Staff Education as per Part I.B.3(a)(4) of the permit (Permit Requirement (4), in Part B, above), unless this new permit condition is already being met. Additional measurable goals should not be necessary if the elements described in Part C, above, constitute full program implementation and a commitment to continue these elements for all additional permit requirements.

Check Box 1 or 2, below. The Table in Part 3 must be filled out if you check Box 2.

1. Staff training program(s) listed in Part C.4, above, have been fully implemented and are ongoing.
 (It is not necessary to complete Part 3 below if you check this box.)

2. One or more staff training program(s) have **NOT** been fully implemented and measurable goals have been provided in Part 3 below for each of the pending programs.
 (You must complete Part 3 below if you check this box.)

3. Illicit Discharge Detection and Elimination Measurable Goals: Include those staff training program(s) that have **NOT** already been fully implemented, and provide the year by which implementation will occur. **Measurable Goals must be completed by 2009.**

	Illicit Discharge Detection and Elimination Measurable Goals-Training <i>List each program element, briefly describe. Provide the year(s) for implementation</i>	Implementation Year
3.a	Though general staff training was provided to applicable staff at the inception of the IDDE program and continues to be addressed in the annual training under the pollution prevention/ good housekeeping program, a more comprehensive and structured training program will be developed specific to IDDE. Detailed training presentations specific to illicit discharge response will typically occur once a permit term because there is little employee turnover, but will be held more often if necessary. The training program will further develop and implement training for municipal staff to enable them to recognize and appropriately respond to and report illicit discharges observed during typical duties. The stormwater program staff will reevaluate who will be likely to make such observations and therefore receive training.	December 31, 2009

Town of Castle Rock	CONSTRUCTION SITES RUNOFF CONTROL	STORMWATER DISCHARGES ASSOCIATED WITH MS4s Program Descriptions 2008–2013
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A. Program Perspective

The goal of the Construction Sites Runoff Control Program is to reduce, to the maximum extent practicable, sediment and other construction-related pollutants from entering the municipal separate storm sewer system.

B. Permit Requirements

The permittee must:

- 1) *Develop, implement, and enforce a program to reduce pollutants in any stormwater runoff, and to reduce pollutants in, or prevent when required in accordance with I.B.3, non-stormwater discharges that have the potential to result in water quality impacts (e.g., construction dewatering, wash water, etc.), to the MS4 from construction activities that result in a land disturbance of one or more acres. Reduction of pollutants in discharges from construction activity disturbing less than one acre must be included in the program if that construction activity is part of a larger common plan of development or sale that would disturb one or more acres. If the Division waives requirements for stormwater discharges associated with a small construction activity in accordance with 61.3(2)(f)(ii)(B) (the “R-Factor” waiver), the permittee is not required to develop, implement, and or enforce its program to reduce pollutant discharges from such a site. **(Clarified permit requirement)***

- 2) *Develop and implement the program to assure adequate design, implementation, and maintenance of BMPs at construction sites within the MS4 to reduce pollutant discharges and protect water quality. The program must include, at a minimum, the development, implementation, and documentation of:*
 - i) *Program Requirements, including:*
 - A) *An ordinance or other regulatory mechanism to require erosion and sediment controls, as well as sanctions and procedures adequate to ensure compliance, to the extent allowable under State or local law.*

 - B) *Requirements for construction site operators to implement appropriate erosion and sediment control BMPs.*

 - C) *Requirements for construction site operators to implement BMPs to control waste such as discarded building materials, concrete truck washout, chemicals, litter, sanitary waste, and other non-stormwater discharges including construction dewatering and wash water, at the construction site that may cause adverse impacts to water quality. **(Clarified permit requirement)***

 - ii) *Compliance Assessment, including:*

- A) *Procedures for site plan review which incorporate consideration of potential water quality impacts.*
- B) *Procedures for construction site compliance assessment, including:*
 - 1) *Site inspections; and*
 - 2) *Receipt and consideration of information submitted by the public.*

iii) Compliance Assurance, including:

- A) *Procedures for enforcement of control measures that includes documented procedures for response to violations of the permittee’s program requirements. Procedures must include specific processes and sanctions adequate to minimize the occurrence of, and obtain compliance from, chronic and recalcitrant violators of control measures. **(New permit requirement)***
 - 1) *Specific Deadline for Renewal Permittees: Renewal Permittees must comply with the requirement of subparagraph (A) to develop, document and implement response procedures that specifically address chronic and recalcitrant violators by no later than December 31, 2009.*
- B) *An education and training program for municipalities, their representatives and/or construction contractors. At a minimum, the program must include an information program for construction site operators unfamiliar with the reviewing authority’s regulatory requirements.*

C. Program Elements: By using existing, ongoing program elements to meet the permit requirements, the MS4 is committed to continuing each of these program elements. Any changes would require use of the program modification process as outlined in Part I.E.2 of the permit.

Address the existing program elements, including those developed during the first permit term. If elements developed during the first term will be discontinued in the second term, include a brief summary of the discontinued element(s).

1. Regulatory Mechanism to require BMPs and sanctions to ensure compliance—List all ordinances (or other regulatory mechanisms) your Construction Sites program is operating under that allow you to require BMPs and enable sanctions to ensure compliance. For all ordinances/mechanisms, provide the title and date of adoption/revision.

<i>Program Description</i>
<p>The Town uses the Grading, Erosion and Sediment Control (GESC) Manual as adopted by Ordinance 2006-16 on March 28, 2006 (and as amended) as the regulatory mechanism to require BMPs and sanctions to ensure compliance under the Construction Sites program. [GESC Manual, MC15 Section 15.12] The provisions of the GESC Manual apply to and govern over any and all land-disturbing activities within the corporate limits of the Town. The Manual requires a GESC permit for most land disturbance activities within the corporate limits of the Town. All plans for land disturbing activities within the Town, as well as specifically within the Cherry Creek Basin, must adhere to the GESC Manual requirements for erosion and sediment control. There are certain exceptions as outlined in Section 1.4.2 of the GESC Manual.</p> <p>In addition, the Town uses the Single-Family Residential Drainage, Erosion, and Sediment Control (DESC) Requirements Ordinance 2004-28 adopted on May 25, 2004 as the regulatory mechanism to require BMPs and</p>

sanctions to ensure compliance on individual residential construction sites through the DESC program. [DESC, MC15 Section 15.10]. This permitting program and ordinance is for any new single-family residential construction and new construction requiring a building permit, including but not limited to additions and construction areas, and accessory structures on existing single-family residential lots; and grading, excavating and stockpiling of earth and landscape materials for single-family residential lots (not specifically limited to new construction) which results in the transport of any of these materials off site by any means including, but not limited to, wind or water erosion and vehicular tracking.

2. Requirements for construction site operators to implement appropriate erosion and sediment control BMPs and materials handling BMPs-List the design criteria, BMP manuals, or fact sheets used to guide construction site operators in the selection and design of appropriate BMPs, stabilization methods and materials handling practices. For all items, provide the title and date of adoption/revision.

Program Description

The Town has two references for erosion and sediment control BMPs and materials handling BMPs—*Grading, Erosion, and Sediment Control (GESC) Manual* (March 2006 and as amended) and Section 15.10 of The Town of Castle Rock Municipal Code, adopted by ordinance on May 25, 2008, from which the Single-Family DESC Program is implemented and enforced.

3. Requirements for construction site operators to control waste including discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste—List all ordinances (or other regulatory mechanisms) used that require construction site waste control. For all ordinances/mechanisms, provide the title and date of adoption/revision.

Program Description

The Town has two references for control of construction related waste-The *GESC Manual* (March 2006 and as amended) has BMP requirements (if applicable to the construction site) for solid wastes, concrete truck washout areas, chemical control, sanitary facilities, and other construction site pollutants. Single-Family DESC Requirements Section 15.10 of The Town of Castle Rock Municipal Code, adopted by ordinance on May 25, 2008 has BMP requirements for construction waste specific to individual residential construction..

4. Procedures for site plan review which incorporate consideration of potential water quality impacts –

- a. Site Plan Development: Briefly describe your requirements for construction site operators to develop stormwater control site plans based on the minimum design criteria.
- b. Site Plan Review: Briefly describe your site plan submittal, review, and preliminary approval process (e.g., is a checklist used?). Describe your system to track status of stormwater control site plans. Describe procedures for ongoing review of site plans during active construction (e.g., how are plans reviewed after construction starts and is additional approval required for revisions?) The MS4 is not required to review and/or approve all plans, but must demonstrate adequate project oversight to prevent inadequate plans.

Describe how consideration of potential water quality impacts is achieved (e.g., ordinance requires a permit, which requires a plan, which requires that water quality impacts be considered; water quality impacts are required to be addressed by

development code; etc.) The MS4 is not required to review and/or approve all plans, but must demonstrate adequate project oversight to prevent inadequate plans.

Program Description

All active permit applications are tracked in a database.

The Town's review process includes the use of a checklist and the use of required BMPs for plan approval. A written plan (including drawings) must be submitted for approval prior to any disturbance activity at a site. Sites are inspected regularly during construction. Inspection frequency on each project is based on site activity. Inspections continue regularly until the site has been stabilized (vegetation established) and the permit closed.

The Town's GESC Permit process consists of the following steps:

- An owner determines the level of permit, plans, and approvals, as defined in the GESC Criteria Manual.
- A GESC Plan, together with related development plans, is prepared and submitted to the Town for review and acceptance. The GESC Plan depicts site grading and related improvements and shows the BMPs used to control erosion and sedimentation.
- After the GESC Plan is approved, a GESC Permit application form, fees, and fiscal surety are provided to the Town.
- The site contractor installs the initial BMPs.
- A preconstruction meeting is held with a Town GESC Inspector to review the initial BMPs and discuss the GESC inspection and enforcement process. If the initial BMPs are installed per the specifications of the GESC Criteria Manual, the GESC Permit is signed by the Town, picked up by the contractor, and construction begins. Construction is subject to required and routine inspections by Town staff, input regarding modifications or maintenance needed to more effectively control erosion and sedimentation, and enforcement action for non-compliance.
- Removal of indicated BMPs, final seeding and mulching (if called for), and final inspection occurs prior to the contractor leaving the site.
- After final acceptance of vegetative cover and removal of all temporary GESC controls, fiscal surety is released and the project is closed out.

The Town's DESC Permit process consists of the following steps:

- A Developer/Builder submits a DESC Plan and DESC permit application for review by the DESC Administrators.
- After approval of the DESC Plan and Permit, the Developer/Builder installs erosion and sedimentation controls, per the approved DESC Plan followed by submittal of an Inspection Report from the Contractor, Owner, or Builder.
- An initial inspection is held with a Town DESC Inspector to review the initial BMPs and discuss the DESC inspection and enforcement process. If the initial BMPs are installed per the DESC plan construction begins.
- At the time of rough building inspection for the building permit, a mandatory DESC inspection is performed.
- Additionally, the site is subject to routine proactive inspections throughout the construction process.
- At the end of building construction, a final inspection is performed to verify that the Drainage Certificate meets minimum standards and to ensure temporary or permanent erosion and sedimentation controls are in place and operating effectively prior to release of a certificate of occupancy
- A post construction inspection is performed to verify that permanent erosion control measures have been installed within six months of issuance of a certificate of occupancy unless otherwise extended by request of the property owner.

The inspector has the ability to approve minor adjustments to the plans in the field. Significant changes to

approved plans require that a written request be submitted (Field Change Order) which is reviewed by the Utilities Department at the Town. The Town then issues a written approval for plan changes.

5. Procedures for receipt and consideration of information submitted by the public. Describe how inquiries are processed (i.e., received by, or forwarded to the MS4 Stormwater Program) and responded to. Describe how complaints are tracked and documented.

Program Description

A Castle Rock Stormwater and Pollution Prevention Hotline was established in November 2004. The hotline number (720-733-2235) is posted on the Town website and is included on many of the Stormwater management articles and brochures. The hotline can be used for reporting illegal dumping, suspicious activities, construction site runoff complaints, erosion control complaints, etc.

Complaints are also received through the Town of Castle Rock Customer Service System, via email, and through in person requests made at the Utilities Department front counter.

All incoming complaints are tracked in a database until the issue is resolved. The Town tracks the date of report, the nature of the complaint, and response actions. Such complaints might warrant a field inspection, notification to a construction site operator or other follow up as appropriate to the situation.

6. Procedures for site inspection and enforcement of control measures
 - a. Inspections: Describe procedures used for inspections, and list any manuals or other documentation used by your staff that includes inspection procedures. Include a description of how inspections are documented; how the frequency of inspections is determined; how sites are prioritized for inspections, if past experiences with construction site operators influence frequency; and how sites and inspections are tracked. Describe procedures for regularly scheduled compliance inspections, complaint response inspections, and reconnaissance inspections, as applicable to your program.
 - b. Enforcement: Describe procedures used for enforcement, and list any manuals, response guides, or other documentation used by your staff that dictate how and when a response to non-compliance is carried out and those enforcement actions are tracked. Describe enforcement tools used (e.g., withholding permits, inspections, plan review, C.O., letter of non-compliance, stop work, permit revocation, notice of violation, monetary fines, summons). Describe how enforcement actions are escalated as needed to prevent repeat violations associated with chronic or recalcitrant violators. If procedures are not already fully implemented to address chronic and recalcitrant violators, provide a measurable goal in Part D, below.

Program Description

GESC Program Inspection and Enforcement

Inspection and enforcement of the GESC Program is a high priority at the Town of Castle Rock. The inspection process for the Town's GESC Program includes inspections by the Utilities Department staff and Town GESC Inspectors to include, but not be limited to, the following:

- All GESC projects are inspected routinely during the entire life of the project. After construction is complete, inspections continue on a regular basis until the revegetation effort is complete. Inspection frequency on each project is based on site activity.
- Selected inspections will be provided by the Town of Castle Rock Public Works Inspection staff, including inspections of the initial traffic control and temporary access plan, and any permanent drainage or water quality facilities.

- For all GESC Permits, a mandatory preconstruction meeting (prior to start of earth work) is held with a Town GESC Inspector to review the initial BMPs and discuss the GESC inspection and enforcement process.
- For most GESC Permits, inspection by a GESC Inspector can occur any time during construction when a new on-site GESC manager is chosen.
- For most GESC Permits, some steps during the construction process require the contractor to call in for mandatory inspections by Town staff, including:
 - Inspection by a GESC Inspector after interim- and final-stage BMPs are installed.
 - Inspection by a GESC Inspector prior to issuance of a Right-of-Way Use and Construction Permit.
 - Inspection by a GESC Inspector at final project completion prior to the contractor leaving the site (prior to certificate of occupancy being issued).
 - Inspection by a GESC Inspector one year after final project completion for check of revegetation success.
 - Inspection by a GESC Inspector two years after final project completion, or when vegetation coverage is established.
- GESC projects that disturb more than 40 acres (70 acres for soil mitigation) must have multiple grading phases, and an inspection by a GESC Inspector before the start of each phase.

The enforcement of the GESC Program includes three levels of violations. Level 3 violations are given for minor violations of GESC criteria, generally with 48 hours given to correct the violation(s). A Level 2 violation is given for more serious violations. Generally, Level 2 violations are to be corrected immediately following the issuance of the violation. A Level 1 violation is given for priority violations and failure to correct Level 2 violations within the given timeframe. The GESC Permit is revoked and ALL work on site is stopped until the site is brought back into compliance with the GESC criteria. Level 1 violations are violations viewed by the Town of Castle Rock as posing an immediate serious risk to the health, safety, and/or welfare of people and/or the environment. Level 2 violations (e.g., failure to maintain BMPs, washing concrete trucks in unapproved locations) are viewed as posing a moderate immediate risk to people and/or the environment. Failure to correct any noncompliant item(s) by the deadline will result in the issuance of a Level 1 violation. Examples of Level 1 violations that will result in a Stop Work Order include, but are not limited to:

- Clearing, grubbing or grading without a Town of Castle Rock GESC permit.
- Failure to schedule a preconstruction conference.
- Failure to be able to contact the owner/contractor GESC Manager or alternate GESC Manager during a Level 2 violation.
- Failure to restrict operations to approved limits of construction.
- Failure to clean up tracking of material onto roadways and adjacent paved areas.
- Exporting material to or importing material from a non-permitted site.
- Failure to follow an approved phasing plan.
- Failure to correct Level 2 violations per the directives of the GESC Inspector.

GESC projects that fail to achieve compliance through the Stop Work Order process may be criminally or civilly prosecuted in accordance with the GESC ordinance, as amended. Additionally, re-inspection fees and/or permit renewal fees may be assessed in the event of permit non-compliance and/or issuance of stop work orders on a project.

DESC Program Inspection and Enforcement

The inspection process for the Town's DESC Program includes selected inspections by Town of Castle Rock DESC Administrators that include, but are not limited to, the following:

- Proactive inspections by a DESC Administrator that occur randomly during construction.
- Mandatory inspections including initial, rough, and final for all DESC permitted sites.
- Post-construction inspection is performed to verify that permanent erosion control measures have been installed.
- Complaint-generated inspections based on input from the general public or referrals from Town Staff.

Enforcement of the DESC Program shall include re-inspection fees, notices of violation, Stop Work Orders, and/or criminal or civil prosecution in accordance with the DESC ordinance, as amended.

7. Training and Education for Construction Site Operators—This program element must, at a minimum, include an informational program for construction site operators unfamiliar with the MS4’s (reviewing authority’s) regulatory requirements. Describe how training/education is implemented. Describe the use of any fact sheets, pre-development documents, permit applications, pre-construction meetings, web sites, etc. that outline the MS4 (and/or State) construction requirements pertaining to stormwater.

Program Description

The Town uses the following to educate construction site operators:

- Web site: The Town will determine appropriate advertisement and promotion of training opportunities on the web site offered through other agencies and groups such as IECA, CDOT, CCA, Red Rocks Community College, etc.
- GESC Manual: This document is made available free of charge on the web site or can be purchased through the Utilities Department.
- GESC Field Manual and DESC Guidance Document: These documents are distributed to the permittee prior to construction.
- Pre-construction meetings: During the pre-construction meetings for GESC, the Town informs construction site operators about the requirements of the Town’s program and distributes GESC Field Manual.
- Inspections: Informal education to contractors is being provided through field meetings with Town inspectors. They are providing education to the contractors through this interaction by discussing site-specific issues and by providing guidance through distribution the GESC field manual.
- Contractor Luncheons: The Town also holds monthly Home Builders Association luncheons discussing the requirements and answering questions related to the Single-Family Drainage, Erosion, and Sediment Control Program, as needed.

D. Measurable Goals

Measurable Goals are required for the requirement in Part I.B.4(a)(2)(iii) of the permit (Permit Requirement (2)(iii) in Part B, above) unless this new permit requirement is already being met. Additional measurable goals should not be necessary if the elements described in Part C, above, constitute full program implementation and a commitment to continue these elements for all additional permit requirements.

Check Box 1 or 2, below. The Table in Part 3 must be filled out if you check Box 2.

1. Procedures, as listed in Part C.5.b, above, have already been fully implemented to minimize the occurrence of, and obtain compliance from, chronic and recalcitrant violators of control measures.



(It is not necessary to complete Part 3 below if you check this box.)

2. Procedures have **NOT** already been fully implemented to minimize the occurrence of, and obtain compliance from, chronic and recalcitrant violators of control measures.

(You must complete Part 3 below if you check this box.)

3. Construction Sites Program Measurable Goals: The Measurable Goal has been provided. Include the year by which full implementation of procedures will be achieved to minimize the occurrence of, and obtain compliance from, chronic and recalcitrant violators of control measures will be implemented. **Measurable Goals must be completed by 2009.**

	Construction Sites Program Measurable Goals—Chronic and Recalcitrant Violators <i>Provide the year for implementation</i>	Implementation Year
3.a	N/a	

Town of Castle Rock	POST-CONSTRUCTION STORMWATER MANAGEMENT	STORMWATER DISCHARGES ASSOCIATED WITH MS4s Program Descriptions 2008–2013
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A. Program Perspective

The goal of the Post-Construction Stormwater Management program is to implement planning procedures and enforcement mechanisms to reduce, to the maximum extent practicable, stormwater impacts resulting from areas of new development and significant redevelopment.

B. Permit Requirements

Post-construction stormwater management in new development and redevelopment.

The permittee must develop, implement, and enforce a program to address stormwater runoff from new development and redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, that discharge into the MS4. The program must ensure that controls are in place that would prevent or minimize water quality impacts. The permittee must:

- 1) *Develop, implement, and document strategies which include the use of structural and/or non-structural BMPs appropriate for the community that address the discharge of pollutants from new development and redevelopment projects, and/or that maintain or restore hydrologic conditions at sites to minimize the discharge of pollutants and prevent in-channel impacts associated with increased imperviousness; (**Clarified permit requirement**)*
- 2) *Use an ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects to the extent allowable under State or local law;*
- 3) *Develop, implement, and document procedures to determine if the BMPs required under Item (1), above, are being installed according to specifications. (This may be developed in conjunction with the Construction program area, as described in Part I.B.4);*
- 4) *Develop, Implement, and document procedures to ensure adequate long-term operation and maintenance of BMPs, including procedures to enforce the requirements for other parties to maintain BMPs when necessary; (**Clarified permit requirement**)*
- 5) *Develop, implement, and document an enforcement program, which addresses appropriate responses to common noncompliance issues, including those associated with both installation (subparagraph (3), above) and long term operation and maintenance (subparagraph (4), above) of the required control measures; (**Clarified permit requirement**)*
- 6) *Develop and implement procedures and mechanisms to track the location of and adequacy of operation of long-term BMPs implemented in accordance with the program. (**Clarified permit requirement**)*

C. Program Elements: By using existing, ongoing program elements to meet the permit requirements, the MS4 is committed to continuing each of these program elements. Any changes would require use of the program modification process as outlined in Part I.E.2. of the permit.

Address the existing program elements, including those developed during the first permit term. If elements developed during the first term will be discontinued in the second term, include a brief summary of the discontinued element(s).

1. Regulatory mechanism—List all ordinances (or other applicable controls) used to implement the post-construction program. For all ordinances/controls, provide the title, date of adoption/revision, and a brief description of the authority granted (e.g., provides enforcement authority, inspection authority, etc.). The ordinance or other mechanism must have language requiring that new development and significant redevelopment projects disturbing more than or equal to one acre, and those less than one acre but part of a larger common plan of development or sale, incorporate stormwater management BMPs.

<p><i>Program Description</i></p> <p>The Town uses the Storm Drainage Design and Technical Criteria Manual as adopted by Ordinance 2007-31 on September 25, 2007 (and as amended) to implement the post-construction stormwater management program. [Storm Drainage and Technical Criteria Manual, MC15 Section 15.13] The Manual requires the implementation of permanent BMPs for enhancement of stormwater quality with all development, redevelopment and expansion within the Town. Chapter 15.02 of the Town of Castle Rock Municipal Code requires adherence to the Town of Castle Rock Public Works Regulations, published on July 1998, and reprinted February 12, 1999, and that provides the enforcement authority and inspection authority to implement the program.</p>

2. Design Criteria and Standards—List any SOPs or Design Criteria required, such as Urban Drainage Flood Control District’s Volume 3—BMP Manual, or plan review checklists, for the selection and design of appropriate structural and non-structural BMPs appropriate for the community. List any planning tools such as Master Plans, Comprehensive Plans, Zoning Plans and regional BMPs.

<p><i>Program Description</i></p> <p>The <i>Town of Castle Rock Storm Drainage Design and Technical Criteria Manual</i>, as amended, references the Urban Drainage and Flood Control District’s (UDFCD’S) <i>Urban Storm Drainage Criteria Manual: Volume 3</i>, as amended. The <i>Town of Castle Rock Storm Drainage Design and Technical Criteria Manual</i> also lists the design criteria for a variety of permanent BMPs. In addition, the Town has completed Master Drainage Plans, Outfall System Plans, and Flood Hazard Area Delineation studies for several drainageways in Castle Rock. These plans and studies, though not typically directly related to post construction BMPs (they do not provide design criteria and/or standards), are used by the Town and the developers as a baseline for stream channel improvements and hydrologic impact analyses that are required during development. The criteria manual is available on the Town’s website and can be downloaded in pdf format for free. Hard copies of the manual are available upon request.</p> <p>As of 2008, the Town has completed and adopted the following Master Plans: McMurdo Gulch, Mitchell Gulch and the 2004 Town of Castle Rock Stormwater Master Plan. The following Master Plans are in development as of 2008: 6400 East/West/South Tributaries, East Plum Creek, Sellars Gulch, North/South Dawson Tributaries, Westfield/Omni/Industrial Tributaries, and Parkveiw/Hangman’s Gulch.</p> <p>The Town also utilizes a Drainage Plan Checklist and Phase I, Phase II, and Phase III Drainage Report Checklists for plan review included in the <i>Town of Castle Rock Storm Drainage Design and Technical Criteria Manual</i>.</p>

3. Review and Approval Procedures

- i. Plan Review—Briefly describe your process for review and approval of permanent water quality control plans. Describe your system to track status of plans.
- ii. Field verification—Describe how the correct installation of BMPs is confirmed, and the enforcement procedures used when BMPs have not been built as approved.
- iii. If different procedures are used for municipal projects, roadway construction, etc., include a description here.

<p><i>Program Description</i></p> <p>The <i>Town of Castle Rock Storm Drainage Design and Technical Criteria Manual</i>, as amended, describes the drainage report review process, which includes a pre-application consultation (recommended, but not required), submittal of a drainage report and construction drawings that includes design (by a Colorado P.E.) and location for applicable water quality BMPs by the applicant, and review and acceptance of the report and drawings by the Town of Castle Rock Utilities Department. An operation and maintenance manual (developed by the applicant) for the permanent BMP(s) must also be submitted and accepted prior to construction drawing approval.</p> <p>Field verification of the permanent BMPs is accomplished through two levels of acceptance. Inspections are completed by both Public Works inspections and a representative of the Stormwater Engineering Division. There are two levels of acceptance: preliminary acceptance (following construction of the permanent BMP) and final acceptance (following warranty period).</p> <p>The Town holds surety on all public improvement projects in the event that the Town is required to complete or correct a project that has not been completed or built as approved.</p>

4. Tracking—Describe how permanent BMP locations and maintenance history are tracked.

<p><i>Program Description</i></p> <p>Permanent BMP locations are tracked by the Utilities Department in a GIS database and updates are made within a reasonable timeframe when new BMPs are constructed.</p>

5. Requiring long-term operation and maintenance of BMPs—Describe how you require the long-term operation and maintenance of permanent water quality controls. List methods used, such as drainage easements; language on recorded plats requiring legal title holder be responsible for BMP maintenance; legal authority to inspect, require, perform maintenance and recoup costs; requiring creation of HOA or owner’s association; and procedures to determine if BMPs are installed or constructed in accordance with specifications.

<p><i>Program Description</i></p> <p>The Town uses one or more of the following to require long-term operation and maintenance of the BMPs: drainage easements as recorded by plat or easement agreement; language on recorded plats requiring the legal title holder to be responsible for BMP maintenance; and/or the Town’s legal authority to inspect, require or perform maintenance, and recoup costs to ensure the permanent BMPs are installed and constructed in accordance with the specifications.</p> <p>The Town also requires an operation and maintenance (O&M) manual for the permanent BMP(s) be submitted and accepted by the Town prior to approval of construction drawings for the BMP(s). Those O&M manuals also provide guidance and inspection forms for the O&M activities.</p>

6. Monitor long-term compliance—

- a. Inspections - Describe your inspection programs, including routine and complaint response inspections.
- b. Enforcement—List appropriate enforcement responses used, such as verbal warning to the developer/property owner, letter of noncompliance, notice of violation, chargeback to contractor for work completed by MS4 representatives, and/or municipal summons.

<i>Program Description</i>

<i>Inspection</i>

The Town uses standard checklists for inspecting permanent BMPs and tracks routine inspections in a database. The Town will inspect all permanent BMPs at least once a permit term and in response to complaints.

<i>Enforcement</i>

The Town will use verbal warnings and/or letter of noncompliance to communicate requirements to property owners. In the instances where the lack of maintenance or the unauthorized/unapproved alteration of a permanent BMP occurs, the Town can access the site through a drainage easement or plat note, perform the required maintenance or repair/replace the unauthorized alteration, and charge the BMP owner for that activity.

D. Measurable Goals

Inclusion of measurable goals should not be necessary, as the elements described in Part C, above, should constitute full program implementation and a commitment to continue these elements.

Town of Castle Rock	POLLUTION PREVENTION/ GOOD HOUSEKEEPING FOR MUNICIPAL OPERATIONS	STORMWATER DISCHARGES ASSOCIATED WITH MS4s Program Descriptions 2008–2013
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A. Program Perspective

The goal of the Pollution Prevention/Good Housekeeping for Municipal Operations program is to reduce, to the maximum extent practicable, the amount and type of pollution that is generated by municipal operations or from municipally-owned property.

B. Permit Requirements

The permittee must develop and implement an operation and maintenance program that includes an employee training component and has the ultimate goal of preventing or reducing pollutants in runoff from municipal operations. The program must also inform public employees of impacts associated with illegal discharges and improper disposal of waste from municipal operations. The program must prevent and/or reduce stormwater pollution from facilities such as streets, roads, highways, municipal parking lots, maintenance and storage yards, fleet or maintenance shops with outdoor storage areas, salt/sand storage locations and snow disposal areas operated by the permittee, and waste transfer stations, and from activities such as park and open space maintenance, fleet and building maintenance, street maintenance, new construction of municipal facilities, and stormwater system maintenance, as applicable. The permittee must:

- 1) *Develop and maintain written procedures for the implementation of an operation and maintenance program to prevent or reduce pollutants in runoff from the permittee's municipal operations. The program must specifically list the municipal operations (i.e., activities and facilities) that are impacted by this operation and maintenance program. The program must also include a list of industrial facilities the permittee owns or operates that are subject to separate coverage under the State's general stormwater permits for discharges of stormwater associated with industrial activity; **(New permit requirement)***
 - i) *Specific Deadline for Renewal Permittees: Renewal Permittees must comply with the requirements of subparagraph (1) by no later than December 31, 2009.*
- 2) *Develop and implement procedures to provide training to municipal employees as necessary to implement the program under Item 1, above. **(Clarified permit requirement)***

C. Program Elements: By using existing, ongoing program elements to meet the permit requirements, the MS4 is committed to continuing each of these program elements. Any changes would require use of the program modification process as outlined in Part I.E.2 of the permit.

Address the existing program elements, including those developed during the first permit term. If elements developed during the first term will be discontinued in the second term, include a brief summary of the discontinued element(s).

1. Implementation of an operation and maintenance program - Describe your Pollution Prevention and Good Housekeeping program. Address how oversight of the program's implementation is conducted (e.g., internal audits or reporting). As discussed in Part D, below, you have until 2009 to develop written procedures for all operations and facilities addressed under the Pollution Prevention/Good Housekeeping program. Most permittees will need to provide a measurable goal to fully audit existing procedures and to document at least some additional procedures to meet this permit requirement. The 2009 Annual Report (due March 10, 2010) must include an inventory of all documented procedures. Therefore, it is not necessary to document all currently existing procedures in this submittal.

<i>Program Description</i>
Runoff control plans have been developed for all applicable Town Facilities. Runoff Control Plans will be completed for applicable new facilities as soon as possible within a reasonable timeframe. Facilities with Runoff Control Plans are inspected once a year and the plans updated as necessary.
The Town will continue its Street Sweeping Program.
The Town currently has SOPs for Waste Handling, Spill Response, and Disposal in the IDDE Manual and as part of the Facility Runoff Control Plans.

2. Employee Training program—Describe your program(s) to educate municipal employees on implementing procedures for the Pollution Prevention and Good Housekeeping program.

<i>Program Description</i>
Applicable Town employees are trained once a year on the stormwater program, including how to identify and respond to illicit discharges, and other applicable subjects relative to good housekeeping and pollution prevention.

D. Measurable Goals

Measurable Goals are required as per Part I.B.6(a)(1) of the permit (Permit Requirement (a)(1) in Part B, above), unless this new permit requirement is already being met. Additional measurable goals should not be necessary if the elements described in Part C, above, constitute full program implementation and a commitment to continue these elements for all additional permit requirements.

Check Box 1 or 2, below. The Table in Part 3 must be filled out if you check Box 2.

1. Written procedures and lists, as listed in Part C.3, above, for the implementation of an operation and maintenance program to prevent or reduce pollutants in runoff from the permittee's municipal operations, have already been developed.

(It is not necessary to complete Part 3 below if you check this box.)

2. Written procedures and lists for the implementation of an operation and maintenance program to prevent or reduce pollutants in runoff from the permittee's municipal operations have **NOT** already been fully developed.

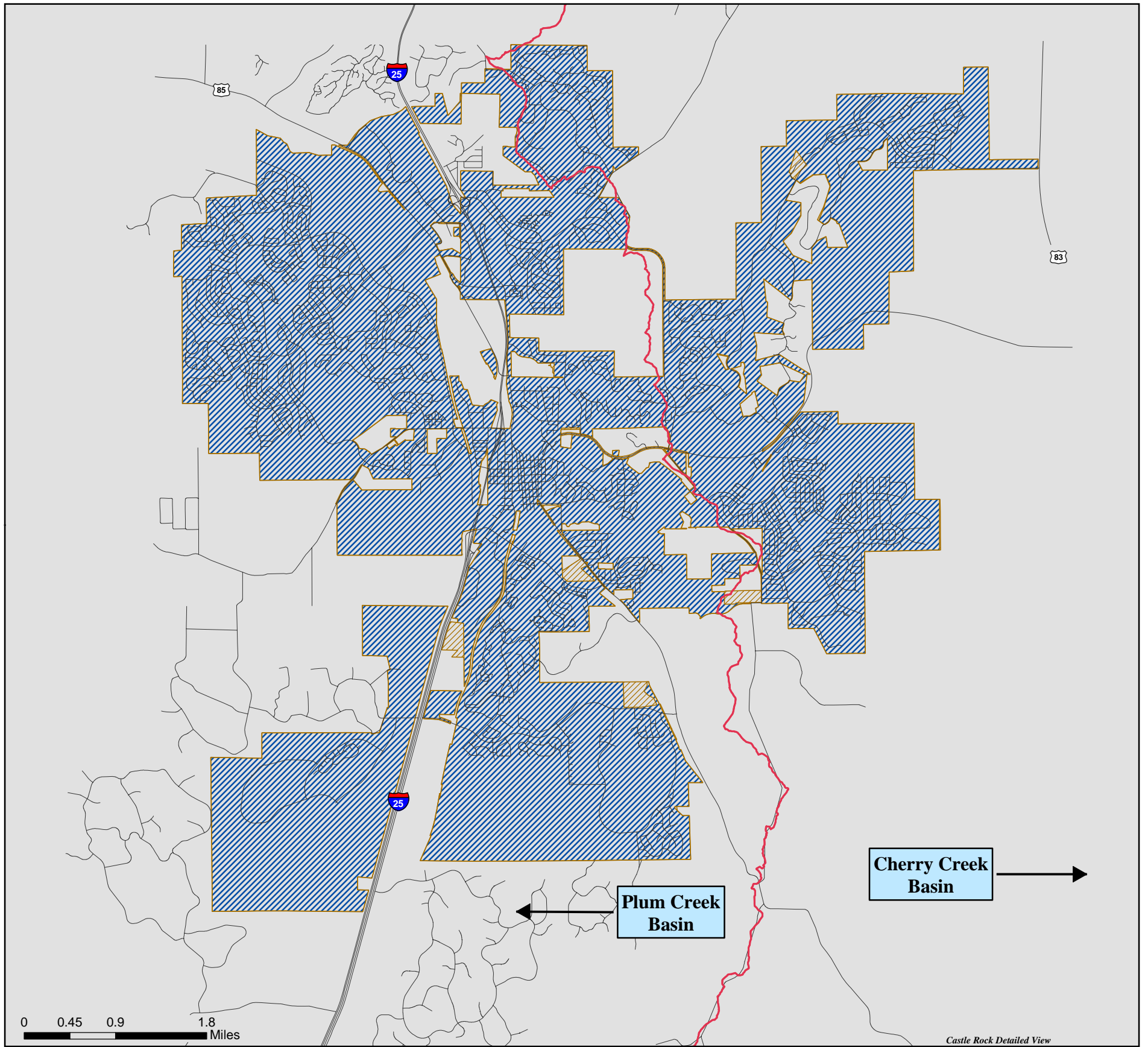
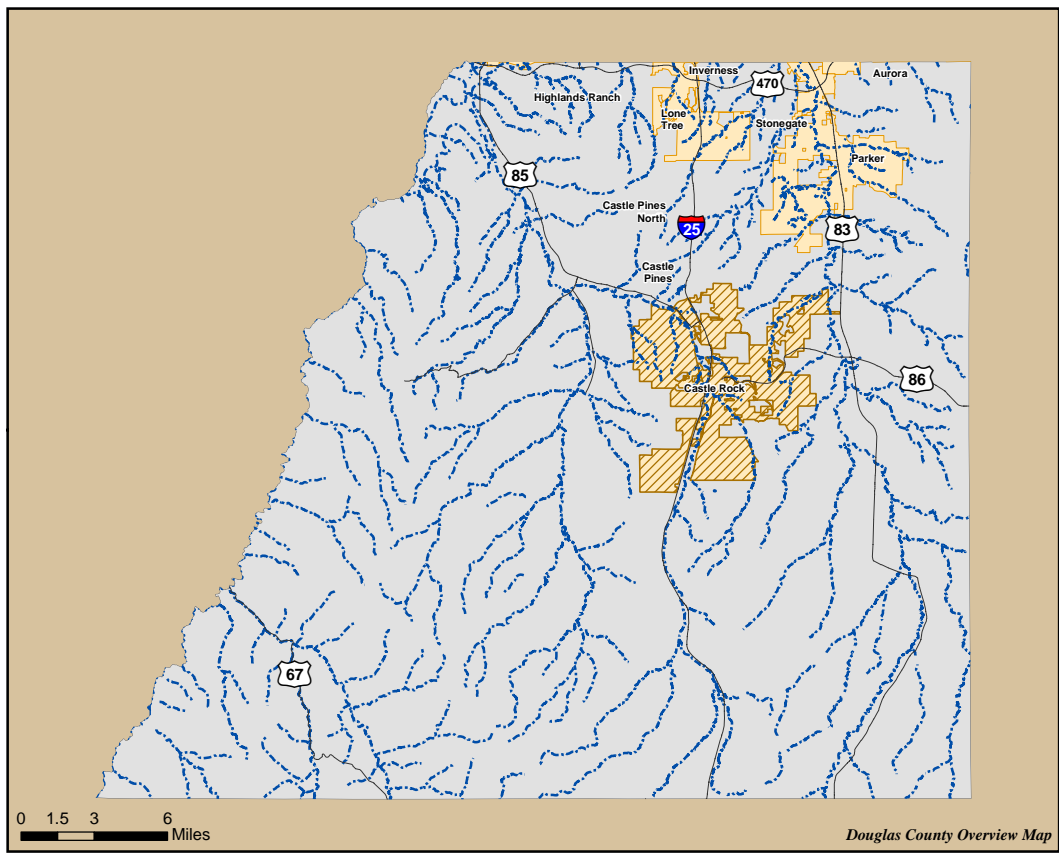
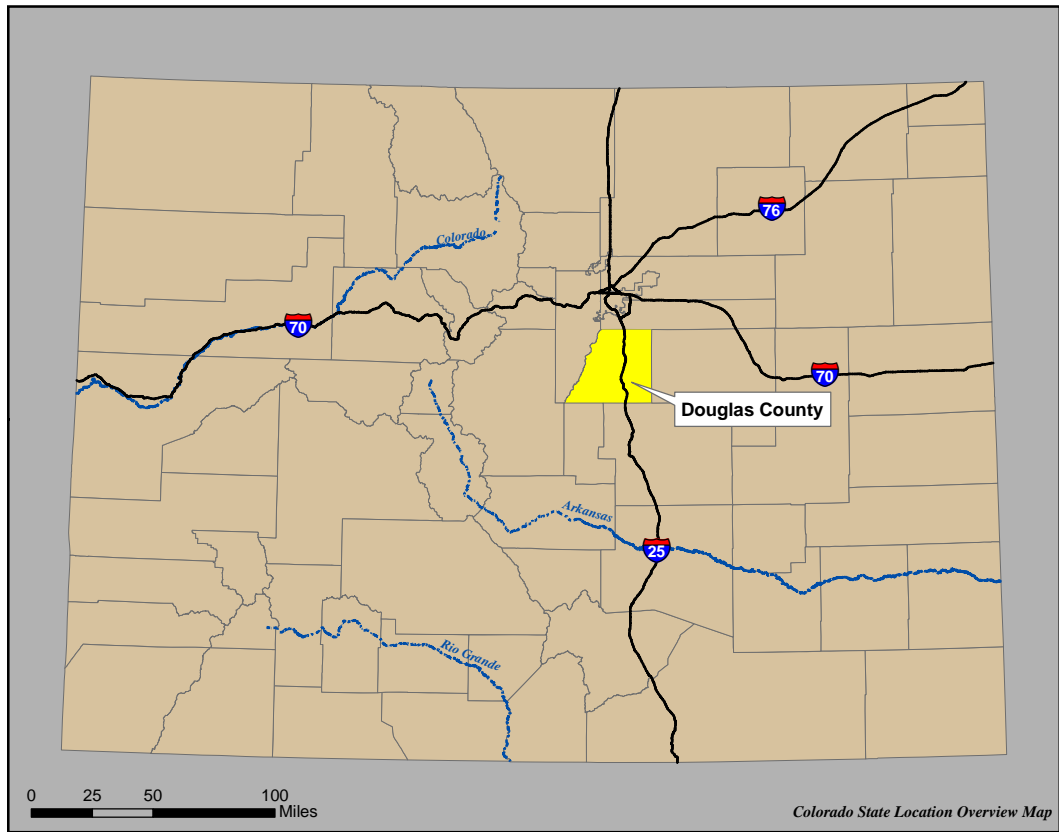
(You must complete Part 3 below if you check this box.)

3. Pollution Prevention/ Good Housekeeping Measurable Goals: The Measurable Goal has been provided. Include the year when written procedures for the implementation of an operation and maintenance program to prevent or reduce pollutants in runoff from the permittee's municipal operations will be fully developed. **Measurable Goals must be completed by 2009.**

	Pollution Prevention/ Good Housekeeping Measurable Goals <i>Provide the year(s) for implementation</i>	Implementation Year
3.a	Town will complete an internal review of existing documented procedures, and develop new written procedures, as necessary, for the implementation of a comprehensive operation and maintenance program to prevent or reduce pollutants in runoff from the Town's municipal operations.	December 31, 2009

Appendix A

MS4 Map



LEGEND

- CherryCreek Basin
- Drainages
- Roads
- Castle Rock Municipal Boundary
- Land Annexed Since Permit Application of February 2003
- Douglas County



NPDES Stormwater Permit

CASTLE ROCK PROGRAM AREA

June 10, 2008

Permit Number: COR-080012

Appendix B

Discontinued Elements

Discontinued Element	Rationale
Public Education and Outreach	
Distribute in the monthly utility bill or by direct mailing to each household within the Town, a minimum of one issue-specific Stormwater Quality fact sheet aimed at residents.	This is not an effective outreach method. The brochures and fact sheets will continue to be available at the Town of Castle Rock Utilities Department counter and on the web site.
Distribute in the monthly utility bill or by direct mailing to each household within the Town, a minimum of one issue-specific Stormwater Quality fact sheet aimed at commercial businesses and light industry to each non-residential utility account within the Town.	This is not an effective outreach method. The brochures and fact sheets will continue to be available at the Town of Castle Rock Utilities Department counter and on the web site.
School programs and public education task force	This element has been difficult to implement due to a lack of participation by the Douglas County School District. However, the Town will continue to support Project WET (Water Education for Teachers) through the Cherry Creek Stewardship Partners and the Douglas County School District when possible.
Radio public service announcements	The Town has found that videos on DC8 and articles in local newspapers are more effective outreach methods than public service announcements aired on the radio.
Stormwater library	The Town will no longer maintain a library because it is too resource intensive to maintain and has not been helpful to employees or the public. All critical stormwater documents are provided on the web site.
Stormwater survey	This has not been an effective outreach tool because only a few Town citizens and employees completed the survey.
Public Participation and Involvement	
Engage local business leaders and local community associations	This has not been an effective public participation method and businesses are educated through information on the web site and videos on DC8.
Formation of a county stormwater management coordination committee	This was not an effective public participation method, but applicable Town employees meet regularly to discuss the Town Stormwater Management Program.
Storm Drain Stenciling Program using local school groups, Boy Scouts, etc.	This was not an effective public participation method, but the program will continue to be evaluated for potential opportunities as Town resources allow and will be tracked under the Public Education and Outreach program.
Traveling Stormwater Management Booth	The Town found that this was not an effective public participation method, but the Town will continue to seek opportunities to present the stormwater model at school and Town functions. This element will be tracked under the Public Education and Outreach program.

Construction Sites Runoff Control	
Distribution of stormwater quality and management fact sheets and brochures specific to Cherry Creek Reservoir nutrient and water quality issues for activities within the Cherry Creek Basin.	This has not been an effective educational method. Rather, construction operators are issued a GESC Field Manual prior to construction.
Post-Construction Stormwater Management in New Development and Redevelopment	
Annual inspections of permanent BMPs	The Town does not have the resources to conduct annual inspections. The Town will, however, inspect each permanent BMP once within the permit term and in response to complaints.

Appendix B—Floodplain Ordinance

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FLOODPLAIN REGULATIONS

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Chapter 18.04

Purpose

18.04.010 Adoption authority

18.04.020 Purposes designated

18.04.010 Adoption authority.

The ordinance codified in this Title for flood regulation is adopted pursuant to the authority contained in Title 31, Article 23, C.R.S. (Ord. 87-52 §1(part), 1988)

18.04.020 Purposes designated.

The purpose of this Chapter is to promote the public health, safety and general welfare, to minimize flood losses in areas subject to flood hazards, and to promote wise use of the floodplain. Specifically, this Chapter is intended to accomplish the following:

A. To reduce the hazard of floods to life and property by:

1. Prohibiting certain uses which are dangerous to life or property in time of flood;
2. Restricting uses which would be hazardous to the public health in time of flood;
3. Restricting uses which are particularly susceptible to flood damage, so as to alleviate hardship and eliminate demands for public expenditures for relief and protection;
4. Requiring permitted floodplain uses, including public facilities which serve such uses, to be protected against floods through the uses of floodproofing and other protective measures at the time of initial construction or reconstruction; and
5. Encouraging low-intensity uses such as agriculture, parking lots, recreation and open space within the floodplain.

B. To protect floodplain occupants from a flood which is or may be caused by their own or other land use and which is or may be undertaken without full realization of the danger, by:

1. Regulating the manner in which structures designed for human occupancy may be constructed so as to prevent danger to human life within such structures;
2. Regulating the method of construction of water supply and sanitation systems so as to prevent disease, contamination and unsanitary conditions; and
3. Delineating and describing areas that could be inundated by floods so as to protect individuals from purchasing floodplain lands for unsuitable purposes.

C. To protect the public from the burden of avoidable financial expenditures for flood control and relief by regulating all uses within the floodplain areas so as to produce a method of construction and a pattern of development which will minimize the probability of damage to property and loss of life or injury to the inhabitants of the flood hazard areas.

D. To protect the storage capacity of floodplains and to assure retention of sufficient floodway area to convey flood flows which can reasonably be expected to occur by:

1. Regulation of excavating, filling, dumping, dredging and alteration of channels by deepening, widening, or relocating;
2. Prohibiting unnecessary and damage-creating encroachment; and
3. Encouraging low-intensity uses such as greenbelt open space, recreation facilities and riding trails.

E. To protect the hydraulic characteristics of the small watercourses, including the gulches, sloughs and artificial water channels used for conveying floodwaters, which make up a portion of the urban drainage system, by:

1. Regulation of filling, dumping and channelization so as to maintain the natural storage capacity and slow flow characteristics;
2. Prohibiting encroachment into the small watercourses to maintain their water-carrying capacity; and
3. Encouraging uses such as greenbelt, open space, recreation and pedestrian and riding trails.
(Ord. 87-52 §1(part), 1988)

Chapter 18.08

Definitions

18.08.010	Appeal
18.08.020	Area of special flood hazard
18.08.030	Base flood
18.08.040	Base flood elevation
18.08.050	Basement
18.08.060	Building
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18.08.190	Lowest floor
18.08.200	Mudslide (mud flow)
18.08.210	New construction
18.08.220	Town
18.08.230	Variance
18.08.240	Watercourse

18.08.010 Appeal.

Appeal means a request for a review of the Town Engineering/Construction Department's interpretation of any provision of this Chapter by the Board of Adjustment. (Ord. 87-52 §1(part), 1988)

18.08.020 Area of special flood hazard.

Area of special flood hazard means the land in the floodplain within the Town subject to a one percent (1%) or greater chance of flooding in any given year. (Ord. 87-52 §1(part), 1988)

18.08.030 Base flood.

Base flood means a flood having a one percent (1%) chance of being equaled or exceeded in any given year. The term is used interchangeably with a one-hundred-year flood. (Ord. 87-52 §1(part), 1988)

18.08.040 Base flood elevation.

Base flood elevation means the water surface elevation of the base flood in relation to mean sea level. (Ord. 87-52 §1(part), 1988)

18.08.050 Basement.

Basement means any area of the building having its floor subgrade (below ground level). (Ord. 87-52 §1(part), 1988)

18.08.060 Building.

Building means a walled or roofed structure, including a gas or liquid storage tank that is principally above ground, as well as a manufactured home on a permanent foundation. (Ord. 87-52 §1(part), 1988)

18.08.070 Channel.

Channel means a natural or artificial watercourse of perceptible extent, with a definite bed and banks to confine and conduct continuously or periodically flowing water. Channel flow thus is that water which is flowing within the limits of the defined channel. (Ord. 87-52 §1(part), 1988)

18.08.080 Development.

Development means any manmade change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations. (Ord. 87-52 §1(part), 1988)

18.08.090 Engineering/Construction Department.

Engineering/Construction Department means the Utilities Department designated to administer and enforce these regulations and includes, among others, the Stormwater manager (sometimes referred to herein as the "Town Engineer") and his or her designees, assistant Town engineers, building and construction inspectors, and retained consultants, engineers and construction management personnel. (Ord. 2005-43 §1, 2005; Ord. 87-52 §1(part), 1988)

18.08.100 Flood.

Flood or *flooding* means a general and temporary condition of partial or complete inundation of normally dry land areas from:

A. The overflow of inland or tidal waters;

B. The unusual and rapid accumulation or runoff of surface waters from any source;

C. Any water from a river, stream, watercourse, lake or other body of standing water that temporarily overflows or inundates adjacent lands and which may affect other lands and activities through stage elevations, back water or increased groundwater level. (Ord. 87-52 §1(part), 1988)

18.08.110 Flood Insurance Rate Map.

Flood Insurance Rate Map or *FIRM* means an official map of the Town issued as part of the flood insurance study, on which FEMA has delineated both the areas of the one-hundred-year flood and the zones subject to risk premium rates. (Ord. 87-52 §1(part), 1988)

18.08.120 Flood Insurance Study.

Flood Insurance Study means the official report provided by the Federal Emergency Management Agency (FEMA) which contains flood profiles and the water surface elevation of a one-hundred-year flood. (Ord. 87-52 §1(part), 1988)

18.08.130 Floodplain.

Floodplain means the relatively flat or lowland area adjoining a river, stream, watercourse, lake or other body of standing water which has been or may be covered temporarily by floodwater. For the purpose of this Title, the *floodplain* is defined as the area that would be inundated by the base flood, and is used interchangeably with the term *one-hundred-year flood* and the term *special flood hazard area*. (Ord. 87-52 §1(part), 1988)

18.08.140 Floodproofing.

Floodproofing means any combination of structural and nonstructural additions, changes or adjustments to structures, which reduce or eliminate flood damage; including utility and sanitary facilities, and which would preclude the entry of water. Structural components shall have the capability of resisting hydrostatic and hydrodynamic loads and the effect of buoyancy. (Ord. 87-52 §1(part), 1988)

18.08.150 Flood protection elevation.

Flood protection elevation means an elevation one (1) foot above the base flood elevation. (Ord. 87-52 §1(part), 1988)

18.08.160 Floodway fringe.

Floodway fringe means that area of the floodplain, outside of the floodway, that would be inundated by the base flood. (Ord. 87-52 §1(part), 1988)

18.08.170 Floodway.

Floodway means the channel of a river or other watercourse and the adjacent portion of the floodplain that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one (1) foot. (Ord. 87-52 §1(part), 1988)

18.08.180 Floodway map.

Floodway map means an official map of the Town, issued by the FEMA as part of the Flood Insurance Study, which shows the boundaries of the floodway for the base flood. (Ord. 87-52 §1(part), 1988)

18.08.190 Lowest floor.

Lowest floor means the lowest floor of the lowest enclosed area (including basement) of a building or structure. An unfinished or flood-resistant enclosure, usable solely for parking of vehicles, building access or storage in an area other than a basement area, is not considered a building's lowest floor; provided that such enclosure is not built so as to render the structure in violation of the applicable nonelevation design requirements of this Title. (Ord. 87-52 §1(part), 1988)

18.08.200 Mudslide (mud flow).

Mudslide or *mud flow* describes a condition where there is a river, flow or inundation of liquid mud down a hillside usually as a result of a dual condition of loss of stabilizing cover, and the subsequent accumulation of water on the ground preceded by a period of unusually heavy or sustained rain. (Ord. 87-52 §1(part), 1988)

18.08.210 New construction.

New construction means structures for which the start of construction commenced on or after the effective date of this Title. (Ord. 87-52 §1(part), 1988)

18.08.220 Town.

Town refers to the Town of Castle Rock, a municipal home rule corporation of the State of Colorado. (Ord. 87-52 §1(part), 1988)

18.08.230 Variance.

Variance means a grant of relief from certain stated requirements of this Title by the Board of Adjustment which may be subject to conditions. (Ord. 87-52 §1(part), 1988)

18.08.240 Watercourse.

Watercourse means a channel, natural depression, slough, artificial channel, gulch, arroyo, stream, creek, pond, reservoir or lake into which storm runoff and floodwaters flow. (Ord. 87-52 §1(part), 1988)

Chapter 18.12

Administration

18.12.010 Duties and responsibilities designated

18.12.020 Review of building permits, subdivision proposals and water and sewer systems

18.12.010 Duties and responsibilities designated.

The duties and responsibilities for administering and carrying out the provisions of this Title shall belong to the Town Engineering/Construction Department. The duties and responsibilities shall include, but not be limited to the following:

A. The review of permits for proposed development to determine whether proposed building sites will be reasonably safe from flooding by the one-hundred-year flood;

B. The review of permits for proposed development to assure that the required permits and documentation of this Title have been obtained from all applicable federal, state or local agencies;

C. The notification of Douglas County and the Colorado Water Conservation Board prior to any alteration or relocation of watercourse and the submittal of evidence of such notification to the Federal Emergency Management Agency;

D. The approval of certificates of occupancy for all uses and structures within lands located in the floodway district and the floodway fringe district upon verification that the premises and structures thereon conform with all of the requirements of this Title.

1. When there has been fill, excavation, erection or substantial improvement of a structure, or construction, the applicant shall provide certification by a registered professional engineer that the finished fill, excavation, building floor elevations floodproofing measures, or other flood protection measures were accomplished in compliance with the provisions of this Title. Certification of the adequacy of the floodproofing of a building may be provided by a registered architect in lieu of a professional engineer;

2. The certification provided by the professional engineer or architect shall include the elevation, in relation to mean sea level, of the lowest floor, including basement, of all buildings that have not been floodproofed. Where buildings have been floodproofed, the elevation of the floodproofing must be established by certification and thereafter maintained in compliance with this Title;

3. Records of all certificates provided by professional engineers or architects in compliance with this Title shall be maintained by the Town Engineering/Construction Department;

E. The maintenance of records of all variances granted from the requirements of this Title, including justification for the granting of the variances;

F. An annual inspection of all properties in the floodway district and the floodway fringe district to assure conformance to the provisions and all permits issued in accordance with this Title;

G. When a watercourse has been altered or relocated, to assure that such watercourse is maintained so that the flood-carrying capacity is not diminished;

H. To trim or remove, or have trimmed or removed, trees and other vegetation in areas of the one-hundred-year flood which, in the Town Engineer's judgment, would pose a hazard in time of flooding. Such trees and other vegetation shall include trees which are dead, fallen or not firmly rooted, and brush in the floodway which would impede the passage of floodwaters;

I. Submit, as required by federal regulations, an annual report to FEMA on the Town's participation in the National Flood Insurance Program. (Ord. 87-52 §1(part), 1988)

18.12.020 Review of building permits, subdivision proposals and water and sewer systems.

A. The Town Engineering/Construction Department shall review all building permit applications for new construction or substantial improvements to determine whether proposed building sites will be reasonably safe from flooding. If a proposed building site is in a location that has a flood hazard, any proposed new construction or substantial improvement, including prefabricated and manufactured homes, must:

1. Be designed or modified, and anchored to prevent flotation, collapse or lateral movement of the structure;
2. Use construction materials and utility equipment that are resistant to flood damage; and
3. Use construction methods and practices that will minimize flood damage.

B. The Town Engineering/Construction Department shall review subdivision proposals and other proposed new developments to assure that:

1. All such proposals are consistent with the need to minimize flood damage;
2. All public utilities and facilities, such as sewer, gas, electrical and water systems, are located, elevated, and constructed to minimize or eliminate flood damage;
3. Adequate drainage is provided so as to reduce exposure to flood hazards; and
4. Best management practices are being used to the greatest advantage.

C. The Town Engineering/Construction Department shall require new or replacement water supply systems and/or sanitary sewage systems to be designed to minimize or eliminate infiltration of floodwaters into the systems and discharges from the systems into floodwaters, and require on-site waste disposal systems to be located so as to avoid impairment of them or contamination from them during flooding. (Ord. 87-52 §1(part), 1988)

Chapter 18.16

General Provisions

- 18.16.010 Jurisdiction**
- 18.16.020 Compliance**
- 18.16.030 Annexation**
- 18.16.040 Supplementary to zoning regulations**
- 18.16.050 Interpretation**
- 18.16.060 Warning and disclaimer of liability**

18.16.010 Jurisdiction.

The jurisdiction covered by the provisions of this Title shall apply to all lands within the corporate limits of the Town that would be inundated by a one-hundred-year flood as designated by the Flood

Insurance Rate Maps of the Town, or, as otherwise determined and designated by the Town Engineering/Construction Department. (Ord. 87-52 §1(part), 1988)

18.16.020 Compliance.

No person shall allow or cause any land within the municipal limits of the Town to be used, zoned or platted, or any structure to be constructed, located, converted, remodeled or altered without full compliance with the requirements of this Title and all applicable regulations. Any violation shall be considered a general code violation and shall be punishable as set forth in Section 1.08.010. (Ord. 87-52 §1(part), 1988)

18.16.030 Annexation.

When a petition is filed to annex property lying within a one-hundred-year floodplain but outside of the area of the Flood Insurance Study, the owners of the property shall provide to the Town a study establishing for that property the base flood elevation and the limits of the one-hundred-year flood and floodway. The study shall be certified by a registered professional engineer competent in open channel hydraulics. In preparing the study, the engineer shall obtain, review and reasonably utilize any base flood elevation and floodway data available from other sources. The study shall be used as the basis for administering the provisions of this Title until other data has been provided by FEMA, or by other competent sources. (Ord. 87-52 §1(part), 1988)

18.16.040 Supplementary to zoning regulations.

The regulations of this Title shall be construed as being supplementary to the regulations imposed on the same lands by an underlying zoning category, or by any other regulations or requirements. Any underlying zoning shall remain in full force and effect to the extent that its provisions are more restrictive than those of this Title. (Ord. 87-52 §1(part), 1988)

18.16.050 Interpretation.

In their interpretation and application, the provisions of this Title shall be held to be minimum requirements and shall be liberally construed in favor of the governing body and shall not be deemed a limitation or repeal of any other powers granted by Colorado Statutes or the Charter of the Town. (Ord. 87-52 §1(part), 1988)

18.16.060 Warning and disclaimer of liability.

The degree of flood protection intended to be provided by this Title is considered reasonable for regulatory purposes and is based on engineering and scientific methods of study. Larger floods may occur upon occasion or the flood height may be increased by manmade or natural causes, such as ice jams and bridge openings restricted by debris. This Section does not imply that the areas outside the floodway district and floodway fringe district boundaries or land uses permitted within such districts will always be totally free from flooding or flood damages, nor shall this Title create a liability on the part of or a cause of action against the Town or any officer employee or appointee thereof for any flood damages that may result from reliance up this Title or any administrative decision made thereunder. (Ord. 87-52 §1(part), 1988)

Chapter 18.20

Mapping

18.20.010 Establishment of districts

18.20.020 Mapping of district boundaries

18.20.030 Interpretation of district boundaries

18.20.010 Establishment of districts.

In order to carry out the provisions of this Title, the areas of the one-hundred-year flood are divided into the following overlay zoning districts:

A. Floodway District (FW). The floodway district shall be those areas identified as floodway on the Flood Insurance Study and the accompanying Flood Insurance Rate Map. In areas outside of the boundaries of the Flood Insurance Study, the floodway district shall be those areas identified as floodway in floodplain studies approved by the Town Engineering/Construction Department and FEMA.

B. Floodway Fringe District (FF). The floodway fringe district shall be those areas identified in studies approved by the Town Engineering/Construction Department as being within the boundaries of the one-hundred-year flood but outside of the floodway. (Ord. 87-52 §1(part), 1988)

18.20.020 Mapping of district boundaries.

The boundaries of the floodway district and the floodway fringe district as established in Section 18.20.010 shall be shown upon the Town's zoning district maps. The extent of this area shall be based upon the best available information, including:

A. The Flood Insurance Study for the Town dated September 30, 2005, and the accompanying series of Flood Insurance Rate Maps (FIRM), as amended, and produced by the Federal Emergency Management Agency (FEMA).

B. Flood hazard area delineation studies produced through the urban drainage and flood control district and approved by the Town Engineering/Construction Department.

C. Other one-hundred-year floodplain studies as approved by the Town Engineering/ Construction Department and accepted by the appropriate local, regional and national flood agencies. When base flood elevation data has not been provided in accordance with FEMA's Flood Insurance Study, the Town Engineering/ Construction Department may require additional base flood elevation and floodway studies to be generated. These elevations must be determined prior to the permitting of new construction, substantial improvements or other development in Zone A (the one-hundred-year floodplain on FEMA maps). The areas of special flood hazard identified by FEMA in a scientific and engineering report entitled "The Flood Insurance Study for the Town of Castle Rock, Colorado," dated September 30, 2005, the Flood Insurance Rate Map with the effective date of September 30, 2005 and any and all amendments to said FIRM are adopted by reference and declared to be a part of this Chapter. The Flood Insurance Study and FIRM are on file at the Town Engineering/Construction Department. (Ord. 2005-43 §2, 2005; Ord. 87-52 §1(part), 1988)

18.20.030 Interpretation of district boundaries.

The boundaries of the floodway district and the floodway fringe district shall be changed on the Town zoning district maps by appropriate amendment procedures contained in the zoning regulations of the Town. Amendment of the district boundaries shall be subject to the following limitations:

A. In areas within the boundaries of the Flood Insurance Study, the boundaries of the floodway district and the floodway fringe district shall be amended only to conform with the changes previously approved by the Federal Insurance Administrator.

B. In areas outside of the boundaries of the Flood Insurance Study, the boundaries of the floodway district and the floodway fringe district shall be changed only upon the presentation of evidence, prepared by a registered professional engineer competent in open channel hydraulics, which shows clearly and conclusively that the boundaries of the districts as mapped are incorrect. The Town Engineer shall review the evidence presented and provide the Planning and Zoning Commission an opinion regarding the evidence presented. Where interpretation is needed as to the location of the boundaries of the floodplain district, the Town Engineering/Construction Department shall make the necessary interpretation of the boundary. Any person contesting the location of the district shall be given a reasonable opportunity to present evidence to the Town Engineer in rebuttal to the Town Engineer's interpretation. The decision of the Town Engineering/Construction Department is appealable to the Board of Adjustment. (Ord. 87-52 §1(part), 1988)

Chapter 18.24

Floodway District

18.24.010 Floodway district

18.24.020 Prohibitions

18.24.030 Permitted uses

18.24.040 Uses permitted with special use permit

18.24.010 Floodway district.

The floodway district is that portion of a river or watercourse which must be reserved in order to discharge the one-hundred-year flood without cumulatively increasing the water surface elevation of that flood more than one (1) foot at any point. The floodway is an extremely hazardous area due to the velocity of flood waters which carry debris, potential projectiles and create a great potential for erosion. Uses within the floodway must remain very low in intensity in order to allow unobstructed discharge of floodwaters. (Ord. 87-52 §1(part), 1988)

18.24.020 Prohibitions.

The following provisions, in addition to all others set forth in Chapter 18.36, shall apply to all uses within the floodway district:

A. No construction, placement or substantial improvement of any buildings shall be allowed, except as specifically approved in accordance with Section 18.24.030;

B. No filling or excavating shall be permitted except upon the issuance of a special use permit;

C. Storage of materials which are buoyant, flammable or explosive, or which in time of flooding could be injurious to human, animal or plant life, is prohibited;

D. No use shall be permitted which would result in any increase in the base flood elevation. (Ord. 87-52 §1(part), 1988)

18.24.030 Permitted uses.

The following uses which have a low flood damage potential and do not obstruct flood flow shall be permitted:

A. Industrial and commercial uses such as loading areas, parking areas and airport landing strips;

B. Private and public recreational uses such as parks, picnic grounds, golf courses, driving ranges, swimming areas, wildlife and nature preserves, fishing areas and trails for hiking, bicycling and horseback riding;

C. Accessory uses to residential dwellings such as lawns, gardens, parking areas and play areas. (Ord. 87-52 §1(part), 1988)

18.24.040 Uses permitted with special use permit.

The following uses may be permitted only upon the approval and issuance of a special use permit;

A. Accessory buildings necessary to the uses listed in Section 18.24.020;

B. Railroads, streets, bridges, dams, utility transmission lines and pipelines;

C. Uses similar in nature to those listed in Section 18.24.020 and subsections A and B of this Section, which are consistent with the purposes and provisions of this Title. (Ord. 87-52 §1(part), 1988)

Chapter 18.28

Floodway Fringe District

18.28.010 Floodway fringe district

18.28.020 Generally

18.28.030 Compliance with Chapter

18.28.040 Permitted uses

18.28.050 Uses permitted with special use permit

18.28.060 Uses permitted in floodway district

18.28.070 Storage of materials and equipment

18.28.010 Floodway fringe district.

The floodway fringe district or one-hundred-year floodplain is also known as the base flood area, and indicates an area where flood levels have a one-percent chance of being equaled or exceeded in any given year. Only low-intensity uses are allowed within the one-hundred-year floodplain, and structures appurtenant to allowable uses may be permitted pending the procurement of a floodplain development permit. (Ord. 87-52 §1(part), 1988)

18.28.020 Generally.

The provisions of this Chapter, in addition to the provisions of Chapter 18.36, shall apply to all uses within the floodway fringe district. (Ord. 87-52 §1(part), 1988)

18.28.030 Compliance with Chapter.

No construction, placement or substantial improvement of buildings shall be allowed, except as set forth in this Chapter. (Ord. 87-52 §1(part), 1988)

18.28.040 Permitted uses.

Any use which is permitted by the underlying zoning district and meets all other requirements of this Chapter is permitted. (Ord. 87-52 §1(part), 1988)

18.28.050 Uses permitted with special use permit.

Any use which is permitted by the underlying zoning district and involves fill, or construction or substantial improvement of a building, is permitted upon approval of a special use permit, subject to the following requirements:

A. All new construction and substantial improvement of residential buildings shall be constructed so that the lowest floor, including basement, is no lower than the flood protection elevation. The fill shall be at an elevation no lower than the flood protection elevation and shall extend at that elevation at least fifteen (15) feet beyond the limits of any structure or building erected thereon.

B. All new construction or substantial improvement of nonresidential buildings shall either have the lowest floor, including basement, elevated to the base flood elevation or, together with attendant utility and sanitary facilities, be floodproofed so that below the base flood elevation the structure is watertight with walls substantially impermeable to the passage of water with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy.

C. Where floodproofing is utilized for a particular building, a registered professional engineer or architect shall certify that the floodproofing methods are adequate to withstand the flood depths, pressures, velocities, impact and uplift forces and other factors associated with the base flood.

D. No construction, placement or substantial improvement of manufactured homes or manufactured home parks shall be permitted under any circumstances within the floodway fringe district. (Ord. 87-52 §1(part), 1988)

18.28.060 Uses permitted in floodway district.

Any use permitted in the floodway district as a use by right or a use by permit shall be allowed in the floodway fringe district and in the identical manner as under the floodway district. (Ord. 87-52 §1(part), 1988)

18.28.070 Storage of materials and equipment.

A. The storage or processing of materials that are buoyant, flammable or which in times of flooding could be injurious to human, animal or plant life shall be at or above a point two (2) feet above the base flood elevation.

B. The storage of materials or equipment which are not subject to major damage by floods, which are firmly anchored to prevent flotation or are readily removable from the flood hazard area within the time available after flood warning, may be permitted below the flood protection elevation. (Ord. 87-52 §1(part), 1988)

Chapter 18.32

Special Use Permits

- 18.32.010 Intent**
- 18.32.020 Hearing by Town Council**
- 18.32.030 Considerations**
- 18.32.040 Conditions**
- 18.32.050 Recordkeeping**

18.32.010 Intent.

Certain uses may have an adverse impact when located in the floodplain because of their effect upon floods or because of the effect of floods upon them. The intent of the special use permit is to provide the means for review of such uses to assure that the purposes of this Title are met and the potential for adverse effects is minimized. (Ord. 87-52 §1(part), 1988)

18.32.020 Hearing by Town Council.

At a public hearing, the Town Council, after review and recommendation by the Planning and Zoning Commission, shall hear and decide all requests for special use permits and construction applications within the one-hundred-year floodplain. (Ord. 87-52 §1(part), 1988)

18.32.030 Considerations.

A. In passing upon any application, the Town Council shall consider all technical evaluations, all relevant factors, all standards specified in other sections of this Title and:

1. The danger that materials may be swept onto other lands to the injury of others;
2. The danger to life and property due to flooding or erosion damage;
3. The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner;
4. The importance of the services provided by the proposed facility to the community;
5. The necessity to the facility of a waterfront location, where applicable;
6. The availability of alternative locations for the proposed use which are not subject to flooding or erosion damage;
7. The relationship and compatibility of the proposed use to the comprehensive plan and floodplain management program for that area;
8. The safety of access to the property in times of flood for ordinary and emergency vehicles;
9. The expected heights, velocity, duration, rate of rise and sediment transport of the floodwaters and the effects of wave action, if applicable, expected at the site; and

10. The costs of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical and water systems, and streets and bridges.

B. Where the request for a special use permit includes an authorization for new construction or substantial improvement of a building, the following additional factors shall be considered:

1. Authorizations for the reconstruction, rehabilitation or restoration of structures listed on the National Register of Historic Places or the State Inventory of Historic Places, may be issued without regard to the procedures set forth in the remainder of this subsection.

2. Authorization shall not be issued within the one-hundred-year floodplain if any increase in flood levels during the base discharge would result.

3. Authorization shall be issued only upon a determination that the same is the minimum necessary, considering the flood hazard, to afford relief.

4. Authorizations shall only be issued upon:

a. A showing of good and sufficient cause;

b. A determination that failure to grant the authorization would result in exceptional hardship to the applicant; and

c. A determination that the granting of an authorization will not result in increased flood height, additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization of the public or conflict with existing local laws or ordinances.

5. If the granting of an authorization would result in the lowest flood elevation of the structure being below the base flood elevation, the applicant to whom the authorization is granted shall be given written notice that the cost of flood insurance will be commensurate with the increased risk resulting from the reduced lowest floor elevation. (Ord. 87-52 §1(part), 1988)

18.32.040 Conditions.

The Town Council may attach any conditions to authorizing construction or the granting of a special use permit within the one-hundred-year floodplain that it deems necessary to further the purposes of this Title (Ord. 87-52 §1(part), 1988)

18.32.050 Recordkeeping.

The Town Council shall maintain through its building inspector the records of any application actions and report any decisions to the Federal Insurance Administration upon request. (Ord. 87-52 §1(part), 1988)

Chapter 18.36

Development Criteria

18.36.010 Generally

18.36.020 Floodplain development permits

- 18.36.030 Certificate of occupancy**
- 18.36.040 New construction and substantial improvements**
- 18.36.050 Channel capacity**
- 18.36.060 Subdivisions and other new developments**
- 18.36.070 Water and sewage systems**
- 18.36.080 On-site waste disposal systems**

18.36.010 Generally.

All uses and development in the floodway district and the floodway fringe district shall comply with the requirements set out in this Chapter. (Ord. 87-52 §1(part), 1988)

18.36.020 Floodplain development permits.

Any development on a site which is not authorized under a building permit or a special use permit shall be permitted only upon the issuance of a floodplain development permit.

A. The floodplain development permit procedure is as follows: The applicant will furnish the following information to the Town Engineering/Construction Department for determining the regulatory flood protection elevation, the location of the proposed use within the floodway or one-hundred-year floodplain area, and other factors necessary to render a decision on the suitability of the particular site for the proposed use:

1. The required submittal to the Town Engineering/Construction Department shall include plans in triplicate prepared by a registered engineer, drawn to scale showing the nature, location, dimensions and elevation of the lot, existing or proposed structures, fill, storage of materials, flood hazard mitigation measures, and the relationship of the above to the location of the channel. Plans must show the elevations in relation to mean sea level of the lowest floor (including basement) of all structures.
2. A typical valley cross-section, showing the channel of the stream, elevation of land areas adjoining each side of the channel, cross-sectional areas to be occupied by the proposed development and high water information. Include a description of the extent to which any watercourse will be altered or relocated as a result of proposed development.
3. A plan (surface view), showing elevations or contours of the ground, pertinent structures, fill or storage elevations, size, location and spatial arrangement of all proposed and existing structures on the site, location and elevation of all streets, water supply and sanitary facilities.
4. Photographs showing existing land uses and vegetation upstream and downstream.
5. A stream profile, showing the slope of the bottom of the channel or flow line of the stream and the one-hundred-year water surface profile.
6. A soils report and profile of any significant geological formation on or adjacent to the site.
7. Specifications for building construction and materials, flood hazard mitigation measures, filling, dredging, grading, channel improvement, storage of materials, water supply and sanitary facilities.
8. Other information as required. Additionally, the Town Engineer may waive certain requirements hereunder deemed unnecessary.

B. Conditional Permits. Upon consideration of these provisions and the intent of this Section, the Town Engineering/Construction Department may require any of the following as conditions to the granting of a floodplain development permit:

1. Modification of waste disposal and water supply facilities.
2. Limitation of periods of use and operation.
3. Imposition of operational controls.
4. Bonds or other financial securities which may be required in order to assure that improvements will be made according to the provisions of the permit, and/or that adequate maintenance will be provided.
5. Implementation of flood hazard mitigation measures. Through the floodplain development process, the Town Engineering/Construction Department may require the applicant to submit a plan or document illustrating the flood hazard mitigation measures to be employed. These measures may include:
 - a. Anchorage to resist flotation and lateral movement;
 - b. Installation of watertight doors, bulkheads and shutters;
 - c. Reinforcement of walls to resist water pressures;
 - d. Use of paints, membranes or mortars to reduce seepage or water through walls;
 - e. Addition of mass weight to structures to resist flotation;
 - f. Installation of pumps to lower water levels in structures;
 - g. Construction of water supply and waste treatment systems so as to prevent the entrance of flood waters;
 - h. Pumping facilities for subsurface external foundation wall and basement floor pressures;
 - i. Construction to resist rupture or collapse caused by water pressure or floating debris;
 - j. Cutoff valves on sewer lines or the elimination of gravity flow basement drains; and
 - k. Elevation of structures and uses to the base flood elevation plus one (1) foot.

The submitted plans for the flood mitigation measures must be certified by a registered professional engineer.

C. The Review Process. The Planning Department will review the proposed use to ascertain whether a floodplain development permit is required. If a permit is required, the Town Engineering/Construction Department will receive and review all submittal materials. When the application is complete, the Town Engineering/Construction Department will transmit one (1) copy of the information described above to any referral agency from which expert technical assistance may be requested. Referral agencies may assist in determining the regulatory flood protection elevation and in evaluating the proposed project in relation to flood heights and velocities, the seriousness of the flood damage to the use, the adequacy of the

plans for protection and other effective regulations. Any fees which may be assessed by referral agencies for this review shall be paid by the applicant.

D. Review Criteria. The following factors will be used in determining the issuance of a floodplain development permit:

1. The danger to life and property due to increased flood heights or velocities caused by encroachments;
2. The danger that materials may be swept onto other lands or downstream to the injury of others;
3. The proposed water supply and sanitation systems and the ability of these systems to prevent disease, contamination and unsanitary conditions, and maintain integrity;
4. The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the public health, safety and welfare;
5. The relationship of the proposed use to the comprehensive plan and floodplain management program for the area;
6. The safety of access to the property in times of flood for ordinary and emergency vehicles;
7. The expected heights, velocity, duration, rate of rise and sediment transport of the floodwaters expected at the site; and
8. A determination of a particular site's suitability by:
 - a. Calculation of water surface elevations based on a hydraulic analysis of the capacity of the stream channel and overbank areas to convey the regulatory flood;
 - b. Computation of the floodway required to convey the flood without increasing heights to an extent which would cause upstream or downstream damage to existing or reasonably anticipated future development; any increase in flood stages attributable to encroachments on the floodway or any river or stream shall not exceed one (1) foot;
 - c. An evaluation of the effects of the proposed use upon the public health, welfare and safety, in light of the purpose of this Title and the standards established herein.

E. Other Permits. The floodplain development permit is required in addition to other permits to review processes which may be associated with the underlying zone district. All applicable federal and state permits must be obtained prior to issuance of a floodplain development permit.

F. Building Permits. Prior to the construction, addition, alteration or change of use of any building or structure or portion thereof and prior to the change or extension of a nonconforming use located in a flood hazard district, a building permit must be received from the inspections division. Before applying for a building permit, the applicant must have received a floodplain development permit, the provisions of which shall be controlling upon the building permit.

G. Nonconforming Uses and Buildings. An existing lawful use of a structure or a lawful building which is not in conformity with the provisions of this Title may be continued according to the provisions found in this Chapter. Proposals to reconstruct nonconforming buildings must obtain a floodplain

development permit and illustrate the flood hazard mitigation measures to be employed. The Town Engineering/Construction Department may require the applicant to submit a plan or document illustrating the proposed flood hazard mitigation measures. (Ord. 87-52 §1(part), 1988)

18.36.030 Certificate of occupancy.

No land within the one-hundred-year floodplain shall be occupied or used and no building or manufactured home which is hereafter erected, placed, moved or structurally altered, shall be used or changed in use until the building inspector approves a certificate of occupancy stating compliance with the provisions of this Title. (Ord. 87-52 §1(part), 1988)

18.36.040 New construction and substantial improvements.

All new construction and substantial improvements within the one-hundred-year floodplain shall:

A. Be designed, modified and adequately anchored to prevent flotation, collapse or lateral movement of the structure;

B. Be constructed with materials and utility equipment resistant to flood damage; and

C. Be constructed by methods and practices that minimize flood damage. (Ord. 87-52 §1(part), 1988)

18.36.050 Channel capacity.

No use shall adversely affect the capacity of the channels or floodways of any tributary to the main stream, any drainage ditch or any other drainage system or facility. (Ord. 87-52 §1(part), 1988)

18.36.060 Subdivisions and other new developments.

All subdivision and other new development shall meet the following requirements:

A. All such activities shall be consistent with the need to minimize flood damage.

B. All public utilities and facilities, such as sewer, gas, electrical and water systems, shall be located and constructed to minimize or eliminate flood damage.

C. Adequate drainage shall be provided to reduce exposure to flood hazards.

D. All proposals shall include base flood elevation data.

E. The boundaries of the floodway district and floodway fringe district shall be shown upon preliminary and final subdivision plats. If a subdivision is located entirely within the floodway district or the floodway fringe district, that information shall be stated on the preliminary and final plats. (Ord. 87-52 §1(part), 1988)

18.36.070 Water and sewage systems.

New and replacement water supply and sanitary sewage systems shall be designed to minimize or eliminate infiltration of floodwaters into the systems and discharges from the systems into floodwaters. (Ord. 87-52 §1(part), 1988)

18.36.080 On-site waste disposal systems.

On-site waste disposal or treatment systems shall be located to avoid impairment to them or contamination from them during flooding. (Ord. 87-52 §1(part), 1988)

Chapter 18.40

Variances

18.40.010 Intent

18.40.020 Considerations

18.40.030 Conditions governing grant of variance

18.40.040 Conditions attached by Board of Adjustment

18.40.010 Intent.

A variance is a modification of the literal provisions of this Title which the Board of Adjustment is permitted to grant when strict enforcement of the provisions would cause undue hardship owing to circumstances unique to the individual property on which the variance is sought. The intent of this Chapter is to establish standards which will guide the Board in advancing the purposes of this Title while providing relief from undue hardships. (Ord. 87-52 §1(part), 1988)

18.40.020 Considerations.

In passing upon requests for variances from the requirements and standards of this Title, the Board of Adjustment shall consider all technical evaluations, all relevant factors, standards specified in this Title and:

- A. The danger that materials may be swept onto other lands to the injury of others;
- B. The danger to life and property due to flooding or erosion damage;
- C. The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner;
- D. The availability of alternative locations, not subject to flooding or erosion damage, for the proposed use;
- E. The compatibility of the proposed use to the comprehensive plan and floodplain management program for that area;
- F. The relationship of the proposed use to the comprehensive plan and floodplain management program for the areas;
- G. The safety of access to the property in times of flood for ordinary and emergency vehicles;
- H. The expected heights, velocity, duration, rate of rise and sediment transport of the floodwaters and the effects of wave action, if applicable, expected at the site;

I. The costs of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical and water systems, and streets and bridges; and

J. Generally, variances may be issued for new construction and substantial improvements to be erected on a lot of one-half (½) acre or less in size contiguous to and surrounded by lots with existing structures constructed below the base flood level, provided that subsections A through I of this Section have been fully considered. As the lot size increases beyond one-half (½) acre, the technical justification required for issuing the variance increases. (Ord. 87-52 §1(part), 1988)

18.40.030 Conditions governing grant of variance.

A. Variances shall not be issued within any designated floodway if any increase in flood levels during the base flood discharge would result.

B. Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief.

C. Variances shall only be issued upon:

1. A showing of good and sufficient cause;

2. A determination that failure to grant the variance would result in exceptional hardship to the applicant; and

3. A determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization of the public, or conflict with existing local laws or ordinances.

D. Variances may be issued for the reconstruction, rehabilitation or restoration of structures listed on the National Register of Historic Places or the Colorado State Inventory of Historic Places without regard to the procedures set forth in this Chapter.

E. Any applicant to whom a variance is granted for construction below the base flood elevation shall be given a written notice, signed by the building inspector or his or her authorized representative, stating that:

1. The issuance of a variance to construct a structure below the base flood elevation will result in increased premium rates for flood insurance up to amounts as high as twenty-five dollars (\$25.00) for one hundred dollars (\$100.00) of coverage;

2. Such construction below the base flood elevation increases risks to life and property. (Ord. 87-52 §1(part), 1988)

18.40.040 Conditions attached by Board of Adjustment.

Upon consideration of the factors listed in Sections 18.48.010 and 18.48.020, and the purposes of this Title, the Board of Adjustment may attach such conditions to the granting of variances as it deems necessary to further the purposes of this Title. (Ord. 87-52 §1(part), 1988)

Chapter 18.44

Appeals

18.44.010 Board of adjustment

18.44.010 Board of adjustment.

All appeals and requests for interpretive decisions made by the Town Engineering/Construction Department concerning any provision of these regulations shall be submitted to the Board of Adjustment in accordance with its standard procedures. (Ord. 87-52 §1(part), 1988)