

Chapter 3

REGULATORY DRIVERS

Denver is committed to protecting and improving water quality conditions in waterbodies receiving stormwater runoff from areas within its boundaries. This commitment is driven not only by local, state, and federal regulations, but also by Denver’s staff and citizens who view the lakes, stream, and rivers within Denver as an amenity and a significant part of its natural resources.

The key federal regulation that pushes communities throughout the U.S. toward the goal of “fishable, swimmable waters” is the federal Clean Water Act. This Act establishes a variety of requirements intended to protect and improve conditions in streams, lakes, and wetlands. Aspects of the Clean Water Act particularly relevant to this Plan focus on regulation of stormwater discharges, water quality standards for waterbodies receiving runoff from stormwater discharges, and implications for water quality standards not being attained. The discussion which follows briefly identifies some of the key regulatory drivers relevant to this project that have evolved in large part from the Clean Water Act, including:

- ▶ Denver’s Phase I Stormwater Colorado Discharge Permit System (CDPS) Permit
- ▶ Denver International Airport (DIA) CDPS Permit
- ▶ U.S. Environmental Protection Agency’s (EPA’s) April 2004 Audit of Denver’s Stormwater Management Program
- ▶ Denver’s stormwater-related requirements and regulations
- ▶ Other Denver ordinances, rules and regulations
- ▶ Colorado Water Quality Control Act and Regulations, including state stream standards
- ▶ Total Maximum Daily Loads (TMDLs)
- ▶ Regional water quality efforts
- ▶ Potential future changes to state and federal water quality permits and regulations

PHASE I STORMWATER CDPS PERMIT

Denver was required to obtain a stormwater discharge permit due to the “National Pollutant Discharge Elimination System Permit Application Regulation for Inclusion of a Stormwater Discharge Regulation,” which was issued on November 16, 1990 (Federal Register, Volume 55, No. 222). There are three major objectives of the stormwater discharge permitting program:

- ▶ Reduce pollutant loadings in municipal storm sewer discharges to the maximum extent practicable (MEP).
- ▶ Eliminate illicit wastewater connections, illegal discharges and non-exempt non-stormwater discharges to municipal storm sewer systems.
- ▶ Implement management programs that apply best available technology (BAT), best conventional pollutant control technology (BCT) and, where necessary, water-quality based controls directed at controlling industrial stormwater pollution.

Denver is permitted to discharge municipal stormwater runoff to state waters in the South Platte River watershed under CDPS Permit No. COS-000001, which was renewed on March 20, 2003 and remains effective until April 30, 2008 (CWQCD 2003). This permit covers “all areas within the corporate boundary of Denver served by, or otherwise contributing to discharges to state waters, from municipal separate storm sewers (MS4s) owned or operated by Denver.” This includes the storm sewer system at DIA, excluding DIA’s industrial system, which is covered under DIA’s industrial stormwater permit (COS-000008).

Denver’s permit was originally issued in 1996 under the “Phase I” stormwater regulation. The subsequent “Phase II” stormwater regulation, which is best known for the requirements it places on smaller communities, also affected Denver’s permit. Examples of key changes to Denver’s permit due to the Phase II stormwater regulation included: 1) regulation of one acre or more of disturbance at construction sites, whereas a five-acre trigger was in place under the initial permit; and 2) increased emphasis on public education/outreach.

Denver’s current permit specifies stringent requirements with which Denver must comply through a combination of a Stormwater Management Program, regular program review and modification, wet weather monitoring, conformity with a compliance schedule, annual reporting, signatory certification, and other measures. The Stormwater Management Program must address these five major categories: commercial/residential management, illicit discharge management, construction sites, municipal facility runoff controls and industrial facilities runoff. To frame the seriousness and extent of the requirements under this permit, the terms “shall” and “will” are used over 200 times in the permit. Consequences for violations include significant fines and possible imprisonment for knowing violations of the permit. In addition to measures it must implement, Denver is also required to “ensure,” “insure,” or “assure” the following:

- ▶ With regard to new development planning procedures for commercial/residential areas, the permit specifies: “City ordinances and rules shall be revised as necessary to include provisions to ensure that stormwater quality controls installed for significant development or redevelopment are adequately operated and maintained.” (Part 1, B. 2.c.).
- ▶ With regard to inspection and enforcement procedures as part of project review and approval procedures for new commercial/residential development, the permit specifies: “Developments shall be inspected for compliance to insure that all specified BMPs are constructed in accordance with the approved plan.” (Part 1, B. 2.e. iii.).
- ▶ With regard to assessing the impacts of flood management projects under the commercial/development management program, the permit specifies: “The permittee shall continue to implement procedures to assure that the impact on water quality is assessed for proposed flood management projects.” (Part 1, B. 4.).
- ▶ With regard to procedures for site inspection and enforcement at construction sites, the permit specifies: “procedures to insure that BMPs are being installed and maintained according to the approved plan and that sediment sources, materials, equipment maintenance areas (including fueling) and other significant sources of pollution have been addressed” and “enforcement provisions to insure compliance with requirements as

defined in Denver ordinances and rules, and approved plans and to insure effective operation and maintenance of BMPs.” (Part 1, B. 2.d.3.a.i. & iii.).

A brief overview of the specific types of requirements in the permit includes the following:

Residential/Commercial Management Program

1. Maintenance of Structural Controls—implement a program of routine maintenance activities for municipally owned structural controls to reduce pollutants.
2. New Development Planning Procedures—continue to implement comprehensive planning procedures and enforce controls to reduce the discharge of pollutants after construction is complete from areas of new development and significant redevelopment.
3. Public Street Maintenance—continue to operate and maintain public streets, roads and municipal parking lots in a manner so as to reduce the discharge of pollutants (including those related to road repair, street sweeping, snow removal, sanding activities and herbicide application).
4. Assess Impacts of Flood Management Projects—continue to implement procedures to assure that the impact on water quality is assessed for proposed flood management projects.
5. Pesticide, Herbicide, and Fertilizer Application—continue to implement controls to reduce the discharge of pollutants related to application of pesticides, herbicides, and fertilizers.

Illicit Discharges Management Program

1. Prevention of Illicit Discharges and Improper Disposal—continue to implement an ongoing program to detect and remove (or require the discharger to the MS4 to obtain a separate CDPS permit for) illicit discharges and improperly disposed materials into the MS4 in accordance with this program area.
2. Ongoing Field Screening—continue to implement an ongoing program to screen the MS4 for illicit discharges, illegal dumping and illicit connections.

**EXHIBIT 3.1
OVERVIEW OF DENVER’S
STORMWATER PERMIT
REQUIREMENTS**

RESIDENTIAL/COMMERCIAL
MANAGEMENT PROGRAM

ILLCIT DISCHARGE
MANAGEMENT PROGRAM

INDUSTRIAL FACILITIES PROGRAM

CONSTRUCTION SITES PROGRAM

MUNICIPAL FACILITY RUNOFF
CONTROL PROGRAM

WET WEATHER MONITORING
PROGRAM

3. Investigation of Suspected Illicit Discharges—continue to implement a program to locate and eliminate suspected sources of illicit connections and improper disposal.
4. Procedures to Prevent, Contain, and Respond to Spills—continue to implement a program to prevent, contain, and respond to spills that may discharge into the MS4.
5. Educational Activities to Promote Public Reporting of Illicit Discharges and Improper Disposal—continue to implement a plan to promote and facilitate public reporting of the presence of illicit discharges or improper disposal of materials into the MS4.
6. Public Educational Activities to Promote Proper Management and Disposal of Potential Pollutants—continue to implement a plan to promote the proper management and disposal of used motor vehicle fluids and household chemical wastes, and to reduce or eliminate the discharge of other pollutants to the MS4.
7. Household Chemical Waste Collection Programs—continue to sponsor a door-to-door household hazardous waste collection program, or substitute an equivalent program that has the same result of making reasonably available to Denver residents the means to recycle/properly dispose of the more common household chemical wastes.
8. Control of Sanitary Sewer Seepage into the MS4—continue the existing program to detect and eliminate sources of sanitary sewer seepage into the MS4.

Industrial Facilities Program—Develop and implement a program to promote proper management of industrial sites regarding stormwater quality and industrial BMPs. The program shall provide education and outreach on pollutants in stormwater discharges to municipal systems from industrial facilities that the permittee determines are contributing or have the potential to contribute a substantial pollutant loading to the MS4.

Construction Sites Program

1. Procedures for Site Planning—continue to implement procedures for site planning that incorporate consideration of potential water quality impacts from construction sites within Denver.
2. Structural and Non-Structural BMPs—continue to implement requirements for the selection, implementation, installation, and maintenance of appropriate BMPs at construction sites.
3. Procedures for Site Inspection and Enforcement—continue to implement procedures for inspection and enforcement of control measures at construction sites.
4. Training and Education for Construction Site Operators—continue to develop, support and encourage attendance at an education and training program for construction site operators.

Municipal Facility Runoff Control Program—continue to implement runoff control plans for specified Denver-owned and/or operated facilities that do not have independent CDPS stormwater permits. New plans shall be developed for any new facilities. Currently covered facilities include:

- ▶ Vehicle maintenance facilities (maintenance includes equipment rehabilitation, mechanical repairs, painting, fueling and lubrication).
- ▶ Asphalt and concrete batch plants which are not already individually permitted.
- ▶ Solid-waste transfer stations.
- ▶ Exposed stockpiles of materials, including stockpiles of road deicing salt, salt and sand, sand, rotomill material.
- ▶ Sites used for snow dumps, and/or for temporary storage of sweeper tailings or other waste piles.

Wet Weather Monitoring Program—continue to implement a wet weather monitoring program to assess wet weather conditions, particularly urban stormwater effects on state waters. Denver, Aurora, Lakewood, and Urban Drainage and Flood Control District (UDFCD) work together (as the Joint Stormwater Task Force) on this program, with actual monitoring conducted by the U.S. Geological Survey (USGS). Samples are collected from receiving waters at five locations: an upstream site, a downstream site, an intermediate site, one major tributary, and a tributary to a major tributary. The monitoring program was designed based on land use considerations, and sampling is conducted based on the rising limb of the hydrograph associated with a precipitation event. The monitoring program was initiated in 1997, with active monitoring beginning in 1998 and continuing through the present. The four-year baseline monitoring period associated with Denver’s first permit term is complete, with a second four-year period in progress for purposes of trend analysis (SAIC 2004).

DENVER INTERNATIONAL AIRPORT (DIA) CDPS PERMIT

When the Colorado Water Quality Control Division (CWQCD) renewed Denver’s municipal stormwater permit in May of 2003, the permit additions included coverage of the MS4 system at DIA. Similar to other U.S. airports, prior to 2002, DIA was already covered under an industrial stormwater permit (COS-000008) which includes industrial activities such as aircraft deicing. Denver’s renewed MS4 permit provides an implementation schedule to bring the airport into MS4 permit compliance with the rest of Denver. As a result, the areas of the airport that are not impacted by industrial activity will follow the same policies, rules and regulations regarding stormwater discharges as the rest of Denver. Extensive coordination between the Department of Public Works and the Department of Aviation is ongoing. Development parcels at the airport will be handled in the same manner as development parcels elsewhere in Denver.

DIA is also covered under a CDPS stormwater construction permit and a Minimum Industrial Discharge (MINDI) permit. The *Roadmap to Development Review, Permitting, and Construction Sites Program Process, Wastewater Management Division Rules and Regulations*

and MS4 Permit Requirements was developed in December 2003 (Denver 2003) and can be referenced for more information on DIA's construction-related stormwater management requirements.

EPA'S APRIL 2004 AUDIT OF DENVER'S STORMWATER MANAGEMENT PROGRAM

During April 2004, EPA Region 8 conducted an audit of Denver's permitted stormwater management program. Appendix B contains a summary of the "action items" from this audit, combined with Denver's responses to EPA's comments. The goal of the audit was to determine the overall success and effectiveness of Denver's compliance with the conditions and requirements of its CDPS permit. The audit included interviews, file review and field inspections. As a result of the final report prepared by SAIC, Denver was required to provide written responses within 60 days on the action items identified by EPA. Overall, the audit indicated that Denver was "well along with the implementation of its MS4 program and has achieved many positives in its program; however, some concerns have been identified." EPA's general program findings included:

- ▶ Denver has an effective public education and outreach program.
- ▶ Denver inspectors thoroughly understand their responsibilities, the MS4 permit requirements, and how to implement these requirements.
- ▶ Denver has areas of its program where additional coordination between Denver departments and between Denver and the CWQCD would be beneficial.
- ▶ Denver has not adequately implemented all standardized procedures throughout the MS4 program. (Better documentation is needed.)
- ▶ Denver has not designated a staff person to be responsible for the stormwater runoff control program at its municipal facilities.

Overall, the comments on the program were positive, with required changes to the program generally characterized as "administrative loose ends" that are relatively easily addressed, as described in Denver's responses to the audit in Appendix B.

DENVER'S STORMWATER QUALITY RELATED POLICIES

The Wastewater Management Division of the Department of Public Works is organized to operate the sewerage system of Denver and to implement and enforce the "Rules and Regulations Governing Sewerage Charges and Fees and Management of Wastewater" and Chapter 56, Articles 91 through 107 of the Revised Municipal Code. A variety of drainage and stormwater-quality-related requirements are identified, the most explicit of which are in Chapter 10, Section 10.17 of the rules and regulations. Because the requirements of this section provide a critical foundation for this Plan, the requirements of Section 10.17 are reproduced in full as follows:

Pursuant to the terms, conditions and requirements of CDPS Permit No. COS-000001, issued to the City and County of Denver by the State of Colorado; the City is required to implement specific programs to control discharges to and from the Municipal Separate Storm Sewer System (MS4) owned or operated by the City and County of Denver. Elements of these mandatory programs require that the City take steps to minimize the discharge of sediment, debris, and other pollutants from construction sites; and provide for enhancing the water quality of storm runoff from fully developed sites.

- a. *Technical Criteria. The minimum technical requirements for all proposed required BMPs relating to water quality are to be based on those specified in the UDFCD Criteria Manual, Volume 3, Best Management Practices, September 1992 and as may be amended.*
- b. *Water Quality Requirements.*
 1. *All development and re-development projects that are located within the Corporate Boundaries of the City and County of Denver shall include in their design, specific measures to enhance the water quality of storm-generated runoff from the fully developed project site. All Best Management Practices (BMPs) identified in the UDFCD Volume 3 Manual are applicable to development and re-development projects within the City and County of Denver.*
 2. *All facilities designed to provide detention of storm-generated runoff for drainage and flood control purposes shall be required to provide water quality enhancement through the use of a timed-release water quality outlet structure or an approved alternative.*
 3. *Timed release water quality outlet structures shall be designed to allow either a 40-hour or 12-hour drain time of a portion of the runoff identified as the Water Quality Capture Volume. The drain time is dependent on the type of proposed detention facility. At a minimum, the determination of the Water Quality Capture Volume and design requirements for timed-release outlet structures shall conform to the methods and procedures outlined in the Urban Storm Drainage Criteria Manual, Volume 3.*

**EXHIBIT 3.2
SELECTED REQUIREMENTS FOR
DEVELOPMENT AND
REDEVELOPMENT PROJECTS IN
DENVER**

PROVIDE BMPS TO ENHANCE
STORMWATER RUNOFF

PROVIDE TIMED RELEASE OF THE
WATER QUALITY CAPTURE
VOLUME FOR SITES REQUIRED TO
DETAIN RUNOFF FOR DRAINAGE
PURPOSES

SUBMIT A STORMWATER QUALITY
CONTROL PLAN TO ADDRESS
WATER QUALITY ISSUES AND
IDENTIFY BMPS FOR THE SITE

4. *All sites that are not required to provide detention of storm runoff for drainage and flood control purposes may still be required to detain for water quality purposes.*
- c. *Waivers. Upon application, review, and approval of said application, waivers from the requirement to detain solely for water quality purposes may be granted.*
- d. *Stormwater Quality Control Plans. All development, re-development, or other construction projects, regardless of size, are required to submit a Stormwater Quality Control Plan that addresses water quality issues and describes all permanent water quality "Best Management Practices" to be used on the fully developed site. The type and scope of this plan varies with the size of the site. Review and approval of this plan by the Manager or his/her duly authorized agents is required before any Wastewater Management Division Permits are issued that relate to the project.*
- e. *Plan submittals. Plans and drawings relating to water quality issues that are submitted for review and approval shall conform to the requirements set forth in the Wastewater Management Division's 1995 guidebook entitled "Stormwater Quality Control Plans: An Information Guide" and as may be amended from time to time.*
- f. *Fees. At the time of issuance of an applicable Sewer Use and Drainage Permit, a non-refundable review fee shall be paid to the City and County of Denver. The amount of such fee shall be charged as established by the Manager.*
- g. *Compliance with Chapter Required for Site Development Plan(s) Approval. No Site Development Plan(s) shall be approved unless said plan(s) include water quality enhancing measures consistent with the requirements of this Chapter and related land development regulations.*

Other key aspects of the Wastewater Management Division regulations that outline requirements related to stormwater quality and quantity and/or elucidate the permitting process related to stormwater and new developments include the following:

- ▶ Sewer Use & Drainage Permit (Section 2.17): A sewer use and drainage permit must be obtained for any new structure or addition to an existing structure. A permit may also be required for any situation which may affect storm drainage, the sanitary sewer system or the storm sewer system. A permit may also be required for any situation which requires review by the Wastewater Management Division. No repair or replacement of any building sewer is allowed prior to the issuance of a Sewer Inspection Permit.
- ▶ Prohibited Discharges to the Storm Sewer System (Section 7.01): Discharges of polluted water, waste or materials into Denver's storm sewers or into water courses that traverse Denver are prohibited. Discharges of industrial or commercial wastewater or any

polluted or contaminated water upon any sidewalk, street, alley, or any gutter are also prohibited. Other prohibitions are also identified.

- ▶ Subdivision/Planned Unit Development/Planned Building Group/Planned Development (Chapter 9): Specific requirements for storm drainage studies, development site plans, construction drawings, grading plans, and protective covenants are outlined. Drainage plans must provide for detention of the 100-year storm event in compliance with the UDFCD's *Storm Drainage Criteria Manual* and current Wastewater Management Division criteria. The owner/maintenance organization is required to be responsible for and pay for all installation and maintenance costs related to on-site storm sewers and storm drainage control facilities. A pre-application conference with the Wastewater Management Division is offered, but not required, to ensure that the developer is properly informed regarding requirements, criteria, and problems related to drainage.

Section 9.04 identifies the Wastewater Management Division-related requirements that must be fulfilled on the Building Department Inspection Record form in order to receive a Certificate of Occupancy:

- a. *A Sewer Use and Drainage Permit has been issued.*
 - b. *Construction of all required storm and sanitary drainage facilities has been completed and accepted by the City.*
 - c. *The Certificate of Inspection for all storm drainage and sanitary sewer facilities has been submitted.*
 - d. *The building sewer connection has been inspected by the Division and a Sewer Inspection Permit has been issued.*
 - e. *All fees required by the City and County of Denver have been received by the City.*
 - f. *All other requirements of the Sewer Use and Drainage Permit have been completed.*
- ▶ Water Quality, Grading, and Erosion Control (Chapter 10): Requirements related to earth disturbance are specified to ensure that soil erosion and sedimentation (and changed water flow characteristics) are controlled to the extent necessary to avoid damage to personal and real property, and to prevent pollution of the MS4 and receiving waters. Post-construction requirements are specified in Section 10.17, as previously discussed.
 - ▶ Storm Drainage Planning and Design (Chapter 11): This chapter requires that all developers plan, design and install storm drainage facilities in compliance with the *Denver Storm Drainage Master Plan* to insure coordinated development of a system which is self-sufficient in each storm drainage basin. Drainage facilities are also required to comply with the *Denver Comprehensive Plan* in cases where future land uses are a consideration in the development of storm drainage facilities. Drainage facilities are also

required to comply with the *Denver Storm Drainage Design and Technical Criteria Manual* and UDFCD's *Urban Storm Drainage Criteria Manual*. Specific storm drainage design criteria are provided for various development types. For example, the initial storm drainage system for commercial/industrial areas must be planned based on the 5-year storm and major drainage systems must be based on the 100-year storm. On-site stormwater runoff detention facilities are required to attenuate the peak flow conditions for both the 100-year and 10-year storm events under fully developed conditions. Other requirements apply for residential development, Planned Urban Developments (PUDs), etc.

The requirements of Chapter 11 are relevant to this Plan for a variety of reasons. One key issue is understanding the difference between requirements for detaining stormwater from a water quantity management perspective and the requirement for detaining stormwater from a water quality perspective. Chapter 11 identifies the water quantity management requirements important for stormwater conveyance systems, whereas Chapter 10 identifies the requirements for the "water quality capture volume" necessary for water quality protection. The water quality capture volume is calculated in accordance with the *Urban Storm Drainage Criteria Manual, Volume 3* (UDFCD 1999) based on smaller, frequently occurring storms (e.g., typically less than the 1-year storm), whereas the water quantity management requirements are based on the 2-, 5-, 10- and/or 100-year storms, depending on the type of development. Opportunities for integration of these requirements are explored further in Chapter 6 of this Plan.

- ▶ Floodplain Management (Chapter 12): This chapter focuses on requirements and prohibitions on development or alteration of property within the Regulatory Floodplain of Denver, except pursuant to the terms of a Sewer Use and Drainage Permit issued by Denver which authorizes such development or alterations.

In summary, Denver has specific rules and regulations in place for managing stormwater quality and quantity. This Plan plays a supporting role relative to these rules, providing approaches and strategies to facilitate better implementation of these rules and regulations.

OTHER DENVER ORDINANCES, RULES AND REGULATIONS

In addition to Denver's rules and regulations that directly relate to water quality, other rules and regulations can restrict the types of stormwater quality management strategies that are implemented at a site. For example, many rules and guidelines exist as part of zoning codes and urban design guidelines specific to various development areas. A review of these rules and guidelines was beyond the scope of this Plan, but would be a valuable step in ensuring that there are not unnecessary hurdles and restrictions that prevent innovative stormwater quality management. As an example, there may be requirements for curbs and gutters or minimum street widths that, under some conditions, would prohibit implementation of certain Low Impact Development techniques.

COLORADO WATER QUALITY CONTROL ACT AND REGULATIONS

The *Colorado Water Quality Control Act* (CRS 25-8-101 through 25-8-702) provides the policy direction to “conserve, protect, maintain, and improve, where necessary and reasonable, the quality of state waters.” The act also authorizes water pollution prevention, abatement and control programs. In Colorado, the Colorado Water Quality Control Commission (CWQCC) regulates water quality and is responsible for establishing classifications and standards to protect beneficial uses of streams, lakes and groundwater in the state (CRS 25-8-201 through 25-8-406). Discharge permits to waterbodies are issued in a manner intended to protect these beneficial uses. For this reason, the underlying classifications and standards are relevant to Denver in terms of its stormwater discharge permit, even though the permit itself contains no numeric standards.

A variety of standards for physical and chemical constituents have been developed for Colorado streams based on their assigned classifications. A brief overview of the subset of use classifications relevant to streams and/or lakes in the Denver area from the *Basic Standards and Methodologies for Surface Water* (5 CCR 1002-31) includes the following:

- ▶ Recreation Class 1—Primary Contact: “These surface waters are suitable or intended to become suitable for recreational activities in or on the water when the ingestion of small quantities of water is likely to occur... Waters shall be presumed to be suitable for Class 1 uses and shall be assigned a class 1a or class 1b classification unless a use attainability analysis demonstrates that there is not a reasonable potential for primary contact uses to occur in the water segment(s) in question within the next 20 years.”
- ▶ Agriculture: “These surface waters are suitable or intended to become suitable for irrigation of crops usually grown in Colorado and which are not hazardous as drinking water for livestock.”
- ▶ Aquatic Life Class 1 Warm Water: “These are waters that (1) currently are capable of sustaining a wide variety of warm water biota, including sensitive species, or (2) could sustain such biota except for correctable water quality conditions.”
- ▶ Aquatic Life Class 2 Warm Water: “These are waters that are not capable of sustaining a wide variety of cold or warm water biota, including sensitive species, due to physical habitat, water flows or levels, or uncorrectable water quality conditions that result in substantial impairment of the abundance and diversity of species.”
- ▶ Domestic Water Supply: “These surface waters are suitable or intended to become suitable for potable water supplies. After receiving standard treatment (defined as coagulation, flocculation, sedimentation, filtration, and disinfection with chlorine or its equivalent), these waters will meet Colorado drinking water regulations and any revisions, amendments, or supplements thereto.”

In addition to these classifications, the majority of the streams and lakes in the Denver area are also classified as “Use Protected” which means that that the CWQCC has determined that the

waters do not warrant the special protection provided by the “outstanding waters” designation or the “antidegradation review” process. (Use-protected waters are allowed to degrade to the level of water quality standards and are not considered “reviewable waters” under the antidegradation regulation [CWQCD 2001].) A variety of criteria can be applied to result in a segment being use-protected, one example of which is an Aquatic Life Warm Water Class 2 designation.

Under its CDPS stormwater permit, Denver is permitted to discharge to multiple locations in the South Platte River basin with stream standards assigned by the CWQCC as summarized in Exhibit 3.3. (See Chapter 2, Exhibit 2.3 for stream locations.) The specific numeric standards associated with these classifications are provided in *Colorado Department of Public Health and Environment Water Quality Control Commission Regulation 38 Classification and Numeric Standards South Platte River Basin, Laramie River Basin, Republican River Basin, Smoky Hill River Basin*, as summarized in Appendix A of this Plan.

One recent change to the classifications that is noteworthy with regard to water quality issues affecting DIA arose from the difficulty of several streams in the DIA drainage basin meeting stream standards for dissolved oxygen (DO). In the July 2004 Triennial Review hearing for the South Platte, Denver proposed adoption of ambient-based DO standards for Second Creek, Third Creek, and Box Elder Creek based on the demonstration that “natural conditions or a combination of natural and irreversible anthropogenic conditions preclude the attainment of the existing DO standards for those streams.” DIA is located in the Third Creek headwaters. In its proposal, Denver (2004) stated:

Stormwater runoff from the airport has enhanced instream flows; however, this runoff may carry aircraft deicing fluid, which has the potential to exert an oxygen demand when the aircraft deicing fluid biodegrades. To minimize human-induced conditions, DIA has satisfied regulatory requirements for implementation of all best practical, available, and economically achievable technology for the control of aircraft deicing fluid. Denver considers the establishment of DIA in this watershed as an irreversible condition because the airport is a permanent part of the landscape and is an important part of the state economy. Deicing will continue to be a requirement for ensuring the safety of air travel.

Denver also conducted a Receiving Water Study to evaluate the aquatic communities of Second Creek, Third Creek, and Box Elder Creek. The study demonstrated that ambient-quality-based DO standards will protect instream classified uses (Denver 2004).

Exhibit 3.3			
Denver Receiving Water Descriptions and Classifications (CWQCD 2003)			
Receiving Water	Basin & Segment	Designated Use¹	Classification
Box Elder Creek	Middle South Platte River, Segment 5	UP	Aquatic Life Warm 2, Rec. 1a, Agriculture
Bear Creek	Bear Creek, Segment 2	UP	Aquatic Life Warm 1, Rec. 1a, Water Supply, Agriculture
Grasmere Lake	Upper South Platte River, Segment 17a	UP	Aquatic Life Warm 1, Rec. 1a, Agriculture
Lakewood Gulch	Upper South Platte River, Segment 16	UP	Aquatic Life Warm 2, Rec. 1a, Agriculture
Sloan's Lake	Upper South Platte River, Segment 17b	n/a	Aquatic Life Warm 1, Rec. 1a, Agriculture
Cherry Creek	Cherry Creek, Segment 3	UP	Aquatic Life Warm 2, Rec. 1a, Water Supply, Agriculture
City Park Lake	Upper South Platte River, Segment 17a	UP	Aquatic Life Warm 1, Rec. 1a, Agriculture
Sand Creek	Upper South Platte River, Segment 16a	n/a	Aquatic Life Warm 2, Rec. 1a, Agriculture
Rocky Mtn. Lake	Upper South Platte River, Segment 17a	UP	Aquatic Life Warm 1, Rec. 1a, Agriculture
Berkeley Lake	Upper South Platte River, Segment 17a	UP	Aquatic Life Warm 1, Rec. 1a, Agriculture
Clear Creek	Clear Creek, Segment 15	UP	Aquatic Life Warm 1, Rec. 1a, Water Supply, Agriculture
First Creek	Upper South Platte River, Segment 16c	UP	Aquatic Life Warm 2, Rec. 1a, Agriculture
Second Creek	Upper South Platte River, Segment 16d	UP	Aquatic Life Warm 2, Rec. 1a, Agriculture
Third Creek	Upper South Platte River, Segment 16e	UP	Aquatic Life Warm 2, Rec. 1a, Agriculture
Bowles Lake	Upper South Platte River, Segment 17c	n/a	Aquatic Life Warm 1, Rec. 1a, Agriculture
Smith Lake	Upper South Platte River, Segment 17a	n/a	Aquatic Life Warm 1, Rec. 1a, Agriculture
South Platte River	Upper South Platte River, Segment 14	n/a	Aquatic Life Warm 1, Rec. 1a, Water Supply, Agriculture
South Platte River ²	Upper South Platte River, Segment 15	UP	Aquatic Life Warm 2, Rec. 1a, Water Supply, Agriculture

Exhibit Notes: ¹ UP = use protected, n/a = not applicable; ² Segment 15 of the South Platte River is immediately downstream of Denver's boundary, but is relevant to Denver from a regional water quality planning perspective.

TOTAL MAXIMUM DAILY LOADS (TMDLs)

Although numeric discharge limits are not generally required under stormwater discharge permits, stormwater and nonpoint source discharges can be affected by numeric stream standards when streams do not attain their designated uses. Specifically, the federal Clean Water Act provides for the total maximum daily load (TMDL) process to allocate pollutant loads or potential pollutant loads among all identified discharge sources so that the combined discharges do not cause the water quality standards for a given waterbody to be exceeded under existing and future conditions (DRCOG 1998). A simplified formula for the components of a TMDL is represented as follows:

$$\text{TMDL} = \text{WLA} + \text{LA} + \text{NBG} + \text{MOS}$$

where:

- ▶ WLA = wasteload allocation representing the portion of loading capacity attributed to point sources and piped stormwater (permitted wet weather stormwater runoff and dry weather flows)
- ▶ LA = load allocation representing the portion of loading capacity attributed to nonpoint sources
- ▶ NBG = natural background representing the portion of loading capacity attributed to natural background conditions (generally a component of the LA)
- ▶ MOS = margin of safety portion of loading capacity attributed to uncertainty

It is important to note that the *Clean Water Plan* (DRCOG 1998) differentiates between wet weather and dry weather conditions as follows:

$$\text{TMDL (dry weather)} =$$

$$\text{WLA (piped dry weather runoff \& point sources)} + \text{NBG (low flow)} + \text{Margin of Safety (MOS)}$$

$$\text{TMDL (wet weather)} =$$

$$\text{WLA (unit area stormwater \& point sources)} + \text{LA (unit area)} + \text{NBG (high flow)} + \text{MOS}$$

Given that TMDLs are driven by the 303(d) list, it is critical that water quality planning in Denver take into consideration known stream segments that do not attain stream standards. The CWQCD's draft 303(d) list for 2004, which was released in November 2003, identified several stream segments receiving stormwater discharges from Denver that do not attain stream standards, as summarized in Exhibit 3.4. The segment listings in this table are generally consistent with similar information contained in Denver's current stormwater permit.

Exhibit 3.4 CWQCD Preliminary 303(d) List for 2004			
ID	Segment Description	Portion	Parameters
COSPCL15	Clear Creek, Youngfield St. to S. Platte River	All	fecal coliform
COSPUS14	S. Platte River, Bowles Ave. to Burlington Ditch	All	Nitrate, fecal coliform, E. coli
COSPUS15 ¹	S. Platte River, Burlington Ditch to Big Dry Creek	Cadmium upstream of MWRD, E. coli from Clear Creek to Fulton Canal diversion and Burlington canal headgate to MWRD	Cadmium ² , E. coli
COSPUS16a	Tributaries to S. Platte River, Chatfield Reservoir to Big Dry Creek	Lower portion of Sand Creek	Selenium, fecal coliform, E. coli
COSPUS16c	Tributaries to S. Platte River, Chatfield Reservoir to Big Dry Creek except specific listings	East Tollgate Creek, West Tollgate Creek, Tollgate Creek ³	Selenium
COSPUS17a	Washington Park Lakes, City Park Lake, Rocky Mountain Lake, Berkeley Lake	Berkeley Lake	Arsenic

Exhibit Notes:

¹ Segment 15 of the South Platte River is immediately downstream of Denver’s boundary, but is relevant to Denver from a regional water quality planning perspective. Segment 15 also receives treated municipal wastewater discharges from the Metro Wastewater Reclamation District (MWRD), which serves much of Denver.

² The cadmium listing is associated with the ASARCO plant.

³ None of the specific stream segment portions listed for COSPUS16c receive runoff from Denver.

During wet weather periods, stormwater and nonpoint source discharges are expected to be the leading contributors of elevated bacteria (i.e., fecal coliform, *e. coli*) in these stream segments, which are all required to meet the stringent Recreation Class 1a standards. Leading sources of bacteria are expected to include pet waste, waterfowl, and wildlife. Most of these sources are difficult, if not impossible, to control and will be a challenge for Denver to address. Denver’s efforts to develop a better understanding of the bacteria sources include an outfall investigation study in the Upper Central Platte Valley of the South Platte River. The Wastewater Management Division accelerated its broken tap and illicit connection program to upgrade sewer conditions in this area. Additionally, the Wastewater Management Division supported a study based on an antibiotic resistance analysis for fecal coliform to try to better define the sources of the bacteria (e.g., animal or human sources) (Baus 2004). Unfortunately, the results of this study were relatively inconclusive; however, additional opportunities exist to support ongoing bacterial

source tracking studies being conducted by the Colorado School of Mines (Munakata-Marr 2004).

Metals listed in Exhibit 3.4 may be associated with wastewater treatment plant discharges, stormwater, and/or naturally elevated conditions. Nitrate concentrations in Exhibit 3.4 are primarily associated with municipal wastewater treatment plant discharges. The draft TMDL for nitrate on Segment 14 of the South Platte River states, “Stormwater runoff from nonpoint sources does not contribute significantly to the nitrate impairment” (South Platte CURE 2003).

In Denver’s stormwater permit, the CWQCD (2003) states that a TMDL for the parameters listed in Exhibit 3.4 will be developed at some point in the future and that this could have an impact on future permit requirements. The CWQCD (2003) further notes in the permit that for the parameters potentially related to stormwater discharges, development of the TMDLs is expected to include the effects of precipitation-related events. The TMDL development may indicate that discharges from Denver’s MS4 have a reasonable potential to cause exceedances of the applicable stream standards and provide a loading allocation that includes stormwater discharges. If this is the case, the CWQCD states that the permit could be amended to include additional requirements for the discharges to the TMDL segments. Such requirements would likely be based on BMPs as opposed to numeric limits (CWQCD 2003). Looking to the future, however, it is important to consider the possibility that federal and state agencies could regulate urban stormwater discharges on the basis of numeric standards, rather than the current BMP-based approach.

With regard to addressing stream segments requiring TMDLs, it is important to recognize Denver’s participation in the South Platte Cooperative for Urban River Evaluation (South Platte CURE) (as discussed later in this chapter). The members of South Platte CURE cooperatively share in-stream monitoring data, conduct modeling, and work toward cooperative development of TMDLs on stream segments requiring them, as is the case of Segment 14 of the South Platte for nitrate.

Although Barr Lake (COSPMS03) and Milton Reservoir (COSPMS03) are not listed as receiving streams in Denver’s permit, it is important to note that these two lakes are listed on the 303(d) list for non-attainment of the pH standard. During 2003, the CWQCD provided a 319 grant to assemble data on conditions in these reservoirs, which could eventually lead to a TMDL on these waterbodies. In the 319 grant application, Denver was identified as contributing over 75 percent of the drainage to these reservoirs; therefore, water quality issues in these waterbodies may also be relevant to Denver from a planning perspective. Denver is listed as a stakeholder in the Barr Lake/Milton Reservoir group.

REGIONAL EFFORTS AND AGREEMENTS

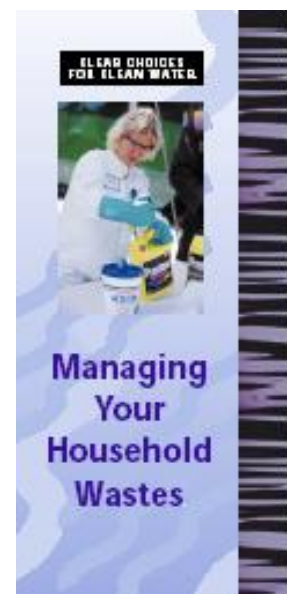
Denver participates in several regional efforts related to water quality planning and improvement efforts. Key efforts discussed in this section that are vital to future water quality planning in Denver include:

- ▶ Denver Regional Council of Governments (DRCOG)/*Clean Water Plan*
- ▶ Joint Stormwater Task Force (Denver, Aurora, Lakewood and UDFCD)
- ▶ South Platte Cooperative for Urban River Evaluation (South Platte CURE)
- ▶ Cherry Creek Stewardship Partners
- ▶ Barr Lake/Milton Reservoir Watershed Association
- ▶ Selenium Stakeholders Group

Denver Regional Council of Governments/*Clean Water Plan*

Denver participates in the Denver Regional Council of Governments (DRCOG), which is responsible under state and federal statutes for regional water quality planning in the Denver area. In this capacity, DRCOG prepares and updates the *Clean Water Plan*, which is the management plan for achieving water quality standards pursuant to Sections 208, 303(e), and 305(b) of the federal Clean Water Act. In keeping with this Act, the region's goal is to "restore and maintain the chemical and physical integrity, in order to assure a balanced ecological community, in waters associated with the region." The objectives, policies and guidelines used in water quality planning and wastewater management, as described in the *Clean Water Plan*, are intended to steer the regional water quality planning process. The *Clean Water Plan* describes wastewater management strategies, watershed water quality programs, wasteload allocations, stream standards, priority regional projects, nonpoint source control strategies and stormwater management programs. The plan provides a regional context for protecting and maintaining water quality through integrated watershed management processes. The objectives, policies and guidelines used in water quality planning and wastewater management are described in the plan. Denver is part of the "South Platte Urban Watershed," which is recognized in the *Clean Water Plan*.

Exhibit 3.5
Clear Choices for
Clean Water Brochure



Joint Stormwater Task Force

Denver, Aurora, Lakewood and UDFCD work together as the Joint Stormwater Task Force to implement a variety of stormwater-permit-related requirements such as public education and stormwater monitoring. The original purpose of this group was to submit a joint Phase I stormwater permit application in 1992; however, the group has continued to work together to implement requirements of the Phase I permit through collaboration on a variety of projects. For example, the group prepared the "Clear Choices for Clean Water" brochures to educate the public on stormwater pollution prevention and continues to coordinate the wet weather monitoring program under the Phase I

permits. Most recently, the group has developed an educational booklet targeting industrial stormwater BMP maintenance and management (Doerfer 2004).

South Platte Cooperative for Urban River Evaluation (CURE)

The South Platte Cooperative for Urban River Evaluation (CURE) was formed in 1999 for a variety of purposes related to water quality on the South Platte River and its tributaries in the metro Denver area. South Platte CURE is a non-profit Colorado corporation primarily made up of municipal entities (i.e., municipal wastewater treatment providers, municipal stormwater agencies, local health departments, and municipal drinking water providers). Specific stream segments addressed by South Platte CURE include Segments 6, 14 and 15 of the South Platte River; Cherry Creek below Cherry Creek Reservoir; Bear Creek below Bear Creek Reservoir; Clear Creek below the ditch diversions near Golden; and Sand Creek. Denver is a financially supporting member of South Platte CURE. A few representative purposes of South Platte CURE include:

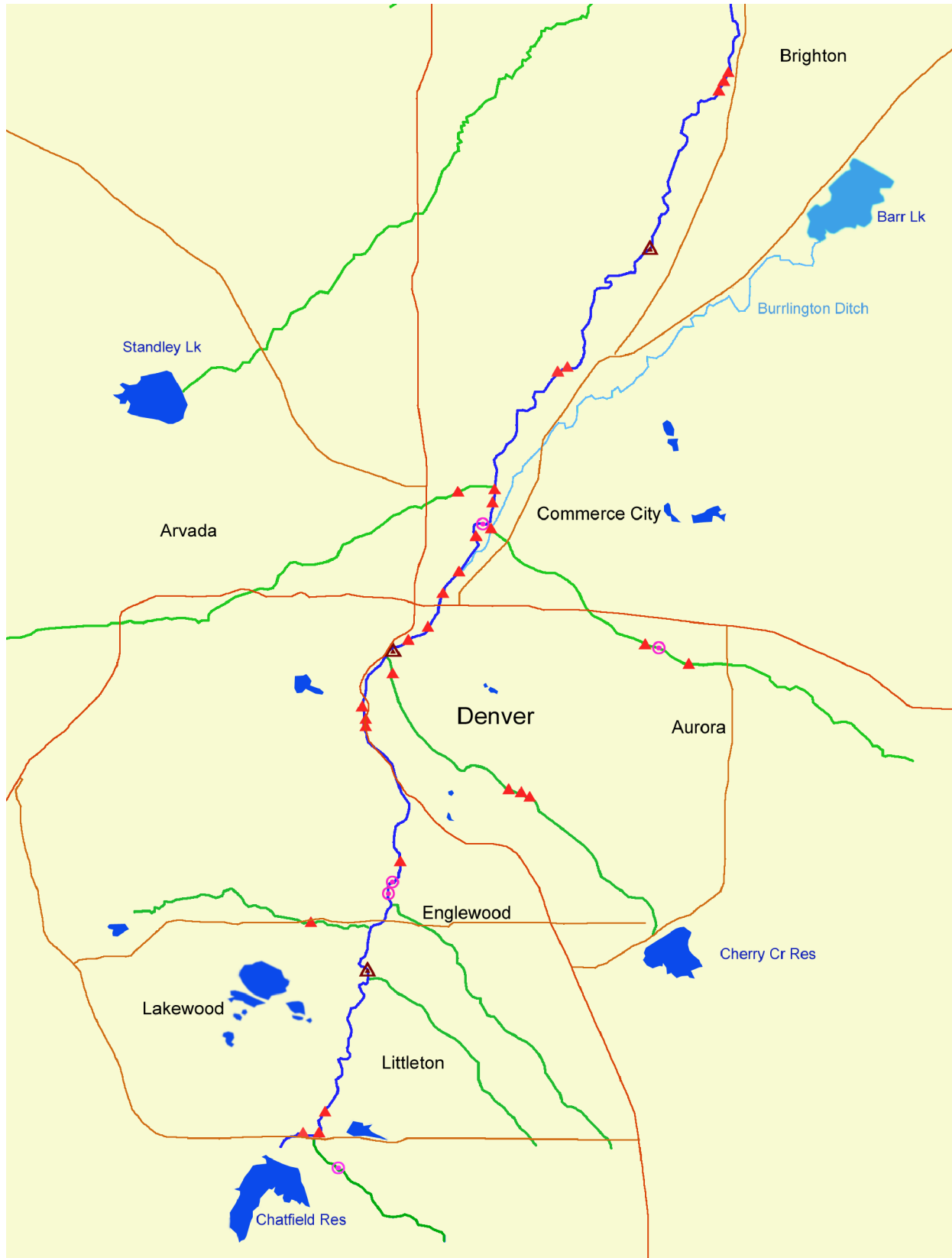
- ▶ Coordinate water quality monitoring and data sharing at permanent trend monitoring locations and for special studies. Exhibit 3.6 identifies these monitoring locations.
- ▶ Maintain, improve and operate low-flow point source and nonpoint source water quality models for use in water quality decisions related to discharge permits.
- ▶ Cooperatively develop recommendations for TMDLs and wasteload allocations.

Some specific South Platte CURE activities of particular relevance to Denver include:

- ▶ A proposed 309 pilot project study that would recalculate the use-specific Table Value Standards (i.e., stream standards) based on the proposed changes to aquatic life use classifications.
- ▶ Cooperative modeling and development of a nitrate TMDL for Segment 14 of the South Platte River. (Segment 14 includes the portion of the South Platte River from Bowles Avenue in Littleton to the Burlington Ditch.)
- ▶ A copper study to evaluate the potential of a site-specific standard for copper on Segment 15 of the South Platte River, which is on the “Monitoring and Evaluation” portion of the 303(d) list. (Segment 15 includes the portion of the South Platte River from Burlington Ditch to below the confluence with Big Dry Creek.) The study is using a variety of techniques to assess the toxicity of copper in the stream to determine the potential appropriateness of a site-specific stream standard for copper for Segment 15 of the South Platte River. Stormwater has been discussed as the major source of copper affecting attainment of stream standards. In the July 2004 Triennial Review for the South Platte River, South Platte CURE formally proposed site-specific standards for copper as a result of this study (South Platte CURE 2004).

- ▶ Ongoing studies and modeling related to sulfate and dissolved oxygen (DO) on the South Platte River.
- ▶ Standardizing and uploading instream data for relevant stream segments into STORET (EPA's water quality database) for public retrieval.
- ▶ Cooperative monitoring of South Platte River Segments 6, 14, and 15 as part of TMDL development. Monitoring includes nutrients, microbiology, and selected metals.

EXHIBIT 3.6 SOUTH PLATTE CURE MONITORING LOCATIONS
(Map Source: South Platte CURE 2004)



Cherry Creek Stewardship Partners

Denver is a signatory to the Cherry Creek Watershed Water Quality and Resource Stewardship Regional Memorandum of Understanding (MOU), along with Arapahoe County, Douglas County, the City of Glendale, the City of Greenwood Village, the Town of Parker, and the City of Centennial. This MOU evolved from the “Smart Growth for Clean Water—Cherry Creek Watershed Partnership” project. The purpose of the Smart Growth project was to “promote the establishment of a continuous natural greenway and innovative watershed enhancements to protect the water quality and the public enjoyment of Cherry Creek, its tributaries, and the Lake.” The overall goals of the Partnership are “to promote the long-term improvement of water quality in the Cherry Creek Basin through land conservation and innovative streamside and watershed enhancements; to promote regional cooperation on these issues; to enhance coordination among land use and water quality leaders; and to pursue funding strategies for these activities.”

Several specific goals in the MOU that are particularly relevant to this Plan include the following:

- ▶ Support smart growth practices to mitigate development-induced water quality impacts.
- ▶ Provide buffers to development.
- ▶ Provide recommendations on urban design to protect Cherry Creek as a natural amenity.
- ▶ Support regional approaches to water quality improvement in the Cherry Creek basin, throughout Douglas and Arapahoe Counties, and in Denver.

Barr Lake/Milton Reservoir Watershed Association

Denver is an active participant in the Barr Lake/Milton Reservoir Watershed Association, which includes stakeholders assembled to evaluate water quality in Barr Lake and Milton Reservoir, including upstream impacts from the Denver metropolitan area. The stakeholders group includes representatives from permitted wastewater dischargers, recreation and aquatic interests, agriculture, industry, water utilities, and local governments. The watershed study area includes a system of canals and streams draining to Barr Lake and Milton Reservoir, located northeast of Denver. Barr Lake is about 15 miles northeast of Denver, and Milton Reservoir is about 20 miles further to the northeast.

Since Denver discharges both stormwater and wastewater into the basin, Denver is providing support in establishing a watershed association and participating in the 319 project to develop a better understanding of water quality issues in the basin. Part of this project includes development of a comprehensive water quality database.

Selenium Stakeholders Group

The Selenium Stakeholders Group consists of the City of Aurora, Conoco, Inc. (now Suncor Energy), Ultramar Diamond Shamrock (now Valero Energy), and Metro Wastewater

Reclamation District. This group is studying the elevated selenium concentrations on Sand Creek (Segment 16a) and the South Platte River (Segment 15). As a result of a stipulation for a temporary modification to the selenium standard on these segments, the Stakeholder Group has developed and is implementing a study plan to develop site-specific criteria for selenium based on data collection and exploration of other options (Lord-Reeves 2003). After three years of data collection, the data collected have not given a clear indication of the sources of selenium within the City of Aurora; therefore, the City of Aurora has undertaken additional studies such as geologic evaluations to explore the potential existence of selenium-bearing rock units within the Tollgate Creek basin (Piatt-Kemper 2003). Both the CWQCD and the parties involved in the Selenium Stakeholders Group recognize that selenium is a statewide issue and agencies within the state are looking at a more statewide solution to the selenium standard issue. The efforts of this group should continue to be monitored for those stream segments receiving runoff from Denver, particularly those that do not currently meet the selenium stream standards. The selenium issue on Sand Creek also highlights the importance of working with neighbors such as Aurora to address these multi-jurisdictional problems.

At the July 2004 Triennial Review, the CWQCD proposed a temporary modification for the chronic dissolved selenium standard on Sand Creek of 19.3 µg/L. This temporary modification was also proposed for East and West Tollgate Creeks and Tollgate Creek through February 2010 (CWQCD 2004).

OTHER FEDERAL AND STATE REGULATIONS

In addition to the specific regulations, permits and efforts already discussed, a wide variety of federal and state environmental regulations have the potential to affect water quality management in the Denver area. An exhaustive review of these regulations is beyond the scope of this Plan; however, a brief bullet list of some laws, regulations, and issues that may be potentially relevant includes:

- ▶ National Environmental Protection Act (e.g., for federally funded transportation projects)
- ▶ Groundwater Management Regulations (e.g., dewatering, discharges to groundwater)
- ▶ Resource Conservation and Recovery Act
- ▶ Individual Sewage Disposal Systems (ISDS) Regulations
- ▶ Safe Drinking Water Act/Source Water Protection
- ▶ Threatened and Endangered Species Act
- ▶ Wetlands (i.e., sections 401 and 404 of the 1987 Clean Water Act amendments)
- ▶ 401 Certification
- ▶ Colorado water law (e.g., affects length of time stormwater may be detained)

Additionally, those managing stormwater planning should be particularly aware of the following common environmental issues and/or permit requirements:

- ▶ Hazardous Materials and Phase 1 Site Assessments: Many old industrial areas occur in Denver; some of those areas have had releases of hazardous materials or contain hazardous substances. Several Superfund sites exist (such as the ASARCO Globeville Smelter and Koppers facility) in and around the Denver area. In these areas, a Phase I

Environmental Site Assessment should be conducted in accordance with ASTM Standard E 1527-00 and new federal standards expected to be circulated by the EPA in late 2004 or early 2005 to identify potential environmental risks and liabilities to the project and construction worker health and safety. This site assessment should consist of a site inspection, records review, and report.

- ▶ **Spill Reporting at Construction Sites:** Contain and clean up spills such as, but not limited to, wash water, paint, automotive fluids, fuel or other petroleum based products, solvents, oils, or soaps, as soon as possible. Do not bury or wash spills into the storm drain or stream. Report all releases of materials into the environment to the Colorado Department of Public Health and Environment (CDPHE) 24-hour Environmental Emergency Spill Reporting Line (877-518-5608).
- ▶ **Section 404 Permit:** Section 404 of the Clean Water Act is administered by the U.S. Army Corps of Engineers (USACE) and regulates filling Waters of the U.S. Section 404 permits from the USACE are required for the placement of dredged or fill materials into waters of the U.S., including wetlands. Dredged or fill material includes any solid material commonly used in construction such as, but not limited to, soil, concrete, metal structures, rock, and pipe. There are various types of Section 404 Permits, including Nationwide Permits, which are issued for activities with relatively minor impacts. An Individual Permit is issued for more major impacts such the relocating of a stream or creek segment, or filling over 0.5 acre of a jurisdictional wetlands. For information about what type of 404 permit may be required, contact the USACE Denver Regulatory office (303-979-4120).
- ▶ **Threatened and Endangered Species:** In the Denver area, wetlands are potential habitat to three federally listed threatened and endangered species, which are protected under the Endangered Species Act. Before the USACE issues a Section 404 Permit, it requires the proposed project have clearance for: 1) Ute Ladies' tresses orchid (*Spiranthes diluvialis*), 2) Colorado butterfly plant (*Gaura neomexicana* ssp. *coloradensis*), and 3) Preble's meadow jumping mouse (*Zapus hudsonius preblei*). A habitat suitability assessment is sufficient to determine if habitat for these species occurs in the proposed project area. If habitat for any of these species, or any other federally listed species (there are over 30 in Colorado), is suspected of occurring in a project area, a trapping or flowering period survey should be conducted to confirm absence or presence.
- ▶ **Section 401 Permit:** If an Individual Permit is needed from the USACE, a Section 401 Water Quality Certification, issued by the CDPHE Water Quality Control Division (CWQCD), is required for a proposed project to fulfill regulatory requirements of Section 401 of the Clean Water Act. Specific requirements of this permit application and permit may be obtained from the CWQCD (303-692-3500 or <http://www.cdphe.state.co.us/wq/PermitsUnit/wqcdpmt.html>).
- ▶ **Construction Stormwater Permit:** Discharges of stormwater runoff from construction sites disturbing one acre or more of land and certain types of industrial facilities require a Colorado Discharge Permit System Stormwater Permit. The Stormwater Permit

application needs to include a Stormwater Management Plan (SWMP), which details erosion and runoff control measures, such as, but not limited to, a revegetation plan and silt fencing, to prevent surface stormwater quality degradation. Current BMPs are to be presented in the SWMP. Specific requirements of the permit application and permit may be obtained from the CWQCD (same contact information as above).

- ▶ Construction Dewatering (Discharge or Infiltration) Permit: Discharges of water encountered during excavation or work in wet areas may require a discharge permit. If the water is discharged to waters of the state, a Construction Dewatering Discharge Permit is required. If the water is discharged to land and allowed to infiltrate, approval from the CWQCD is required. Specific requirements of this permit application and permit may be obtained from the CWQCD (same contact information as above).
- ▶ Minimal Industrial Discharge Permit: Discharges of small quantities of wastewater or wastewater requiring minimal treatment, such as that resulting from hydrostatic testing or certain wash waters, may require a Minimal Industrial Discharge Permit (MINDI). Specific requirements of this permit application and permit may be obtained from the CWQCD (same contact information as above).

CURRENT AND FUTURE COMPLIANCE IMPLICATIONS OF EVOLVING REGULATIONS

Water quality regulations continue to evolve at both the state and federal levels. Changes to these regulations have the potential to impact water quality management in Denver for both point and nonpoint source discharges. Although stormwater and nonpoint source discharges continue to be based on BMPs instead of numeric criteria, these discharges can be drawn into the regulatory process through TMDLs when stream standards are not attained; therefore, regulatory changes that impact stream standards and classifications have significant relevance for stormwater discharges. Several key regulatory changes that are in progress can be reviewed through the *Section 309 Report* (CWQCD 2003) and through the activities of the Colorado Water Quality Forum (CWQF) work groups that explore topics such as impacted water supplies, nutrient criteria, sediment guidance, TMDL/303(d) issues, and water quality trading concepts. The CWQF work group activities are often driven by changes at the EPA under its Clean Water Act programs. (See <http://www.is.ch2m.com/cwqf/> for a list of current CWQF work groups and topics.) Highlights of several emerging regulations are provided below based on the efforts of the CWQF work groups.

Section 309 Report and Potential Aquatic Life Classification Changes

In December 2003, the CWQCD released the *Section 309 Report*, which focused on review of the state standards-setting and classification process. This document provides a basic “road map” of water-quality-related regulatory issues that the state may consider over the next few years. The purpose of the *Section 309 Report* is to assess whether regulatory or policy changes are warranted based on the unique attributes of Colorado waterbodies. Some of the key considerations in the report were affected by the *Arid West Water Quality Research Project*

(Pima County Wastewater Management Department 2003). Some of the specific topics addressed in the *Section 309 Report* (CWQCD 2003) included:

- ▶ The physical, chemical, flow, and habitat characteristics associated with waterbodies, including the ephemeral or effluent-dependent nature of many waterbodies.
- ▶ The potential need for refined designated uses and additional site-specific standards.
- ▶ The benefit of maintaining the functions of constructed water conveyance and storage facilities.
- ▶ The nature of the current use-attainability analysis process and any necessary adjustments.
- ▶ The benefits associated with maintaining downstream ecosystems that are dependent, at least in part, upon the continuation of effluent discharges.

The study process identified a wide variety of distinguishing features of Colorado waterbodies, with particular focus upon natural and human-induced variations in the flow regimes, variabilities in habitat and biological diversity, and the impact of effluent returns on otherwise water-short stream systems.

One key area of discussion with potential relevance to Denver is the identification of potential “refined designated uses” under the state use classification system, primarily with regard to aquatic life classifications. Based on a “strawman” proposal presented by the state, the idea of adopting additional aquatic life use classifications to more accurately describe the actual use of stream systems and establish appropriate accompanying water quality standards is one key potential area of change. These types of revisions would be most significant for “effluent dependent” or “effluent dominated” waterbodies or those that have experienced significant hydrologic modifications. The key implication of such a revised classification system is the removal of needless “impairment” listings under the TMDL program.

Triennial reviews of Colorado’s major river basins will serve as an opportunity to field-test a variety of aquatic life classification modifications and bring them before the Commission at the Basic Standards Rulemaking Hearing in July of 2010 (CWQCD 2003). Currently, the aquatic life classification system includes three categories: Aquatic Life Warm 1 and 2 and Aquatic Life Cold. The new proposed system includes nine principal use classifications that are developed from combining cold water aquatic life, transition zone aquatic life or warm water aquatic life with the categories of aquatic life for lakes/reservoirs, streams with fish, or streams with no fish. In addition to the principal use classifications, several sub-classifications could also be assigned to account for influences from treated effluent or hydrologic/habitat modifications, including considerations such as:

- ▶ Effluent dependent: Waters that would otherwise have an “Aquatic Life-Streams—No Fish” classification, but which have flows adequate to support fish due to treated effluent.

- ▶ **Effluent dominated:** Waters that would have an “Aquatic Life-Streams-Fish” classification without the presence of treated effluent, but for which the flow for the majority of the year consists of treated effluent.
- ▶ **Hydrologic/Habitat Modifications:** Waters that are affected by irreversible human impacts (e.g., water rights diversions, stormwater flows, and agricultural return flows) such that the resulting expected condition differs from that for the associated principal use classification. (The Hydrologic/Habitat Modification sub-classification would only apply when supporting data demonstrates that the modifications are significant enough to change the expected condition.)

The new proposed system embodies the concept of defining an “expected condition” for each of the nine principal use classifications. Expected conditions would not be based on the pristine or totally un-impacted reference condition, but rather on the characteristics of the aquatic community that “...generally would be anticipated without the influence of major human modifications.”

Other concepts explored under the *Section 309 Report* include the “net environmental benefit” concept, which is basically a potential relaxation of standards/effluent limitations on point sources discharging to “water-short” stream systems in order to encourage the continued “beneficial” discharge of the ecosystem-sustaining flows (CWQCD 2003).

Although the *Section 309 Report* itself did not result in any recommended changes to state statutes, the concepts and issues raised could impact future policies, potentially as early as the Basic Standards Rulemaking Hearing in July of 2005. The CWQCD will continue its work with stakeholders to develop a state policy on the potential use of the net environmental benefit concept by October of 2004, which could also be brought before the CWQCC in July of 2005. The CWQCD will also initiate a pilot program to explore refined designated aquatic life use categories.

Possible Stream Standard Changes Under Consideration for July 2005

A variety of issues will be considered at the July 2005 Rulemaking Hearing, in addition to the aquatic life issues discussed above. Some of these issues have implications for stormwater. A brief overview includes changes to organic chemical standards (will be addressed in 2004 in combination with Regulation 41, Basic Standards for Groundwater); revised table value criteria for ammonia, cadmium, copper, antimony, arsenic and uranium; selenium criteria (when developed by EPA); options for decoupling the aquatic life class 2 and use-protected designations; and other issues (CWQF 2003).

Source Water Protection

Source water (i.e., drinking water supply source) protection activities have a link to stormwater issues in that raw water quality for drinking water may be affected by pollutants in stormwater discharges. Sediment, nutrients, pesticides, pathogens, and other pollutants in source waters can decrease treatability, increase treatment costs, and ultimately increase risks to public health.

Water utilities typically respond to deteriorating raw water quality by increasing chemical dosages or adding additional processes. As an alternative or supplement to treatment changes, managers may consider promoting BMPs to protect raw water quality.

A study funded by the American Water Works Association Research Foundation and the Water Environment Research Foundation (AWWARF and WERF 2003) to address these issues found that moderate deteriorations in raw water quality such as a 25 percent increase in solids and total organic carbon (TOC) levels can increase routine operating costs by roughly 10 percent. Many BMPs can prevent water quality deterioration when targeted to major pollutant source areas. AWWARF and WERF note that funding a fraction of BMP implementation costs can be a cost-effective means of reducing routine operating costs for some utilities. AWWARF and WERF recommend that utilities in developing watersheds should promote low impact development practices to reduce long-term water quality degradation. The study recommended that utilities can help protect source quality and reduce treatment costs at minimal expense by forming partnerships with watershed stakeholders. Utility participation in protection efforts helps leverage funds and prioritizes the watershed as a drinking water catchment.

Due to the high cost of treatment plant capital improvements relative to watershed BMPs, AWWARF and WERF recommend that utilities should consider long-term investment in source protection measures in order to reduce the need for major process changes. Utilities should also consider non-economic benefits of source protection, including the public health benefit of reduced exposure to pesticides, pathogens, and emerging contaminants (AWWARF and WERF 2003).

Nutrient Criteria

In September 2002, the CWQCD presented its *Nutrient Criteria Development Plan* to EPA in response to EPA's January 9, 2001 Federal Register notice that was intended to address nutrient over-enrichment in the nation's surface waters. According to EPA (1996), nitrogen and phosphorus are among the leading causes of water quality impairment in the U.S., with 40 percent of rivers and 51 percent of lakes having designated uses impairments from excess nutrients.

EPA has called for states to develop region-specific nutrient criteria for different types of waterbodies to account for the wide natural variation in nutrient loading. For rivers and streams, the CWQCD anticipates developing a statewide approach with regionalization for establishing nutrient criteria. Key elements of the conceptual approach include:

- ▶ Assessments conducted at the basin or sub-basin level (it is anticipated that in some cases site-specific standards may need to be implemented where basin or sub-basin level assessments are not refined enough to account for local conditions).
- ▶ Criteria based on comparisons to "expected conditions."
- ▶ Criteria based on biological endpoints of the algal community that are linked to the designated uses.

Colorado is working on the nutrient criteria using a phased approach, which will first focus on developing nutrient standards for selected targeted waterbodies that have significant nutrient issues and that are high on the priority list. Nutrient criteria for Colorado lakes and rivers will be based on the causal parameters nitrogen and phosphorus, as well as the response parameters Chlorophyll-a, algal communities and transparency (Secchi depth or turbidity). Other possibilities for causal parameters that will be considered include orthophosphate, total Kjeldahl nitrogen, ammonia, nitrate, and dissolved organic carbon (DOC). Additional response parameters such as dissolved oxygen, pH, plankton or macrophyte biomass, percent cover, and species composition may also be considered. Considerations in the form of the criteria may include spatial scale, temporal cycles such as diel or seasonal cycles, and determination of attainment. Colorado anticipates developing numeric criteria (CWQCD 2002).

Of particular relevance to Denver is that the CWQCD is starting with “High Priority Sites” first, one of which is Barr Lake. Barr Lake is located outside of Denver’s boundaries, but it eventually receives runoff from much of the metro Denver area and was named as a receiving water in Denver’s initial CDPS permit. Although Barr Lake is not a direct receiving water for Denver stormwater, EPA has provided the states with the following regulations in CFR Part 131.10(b):

“... in designating uses of a waterbody and the appropriate criteria for those uses, the State shall take into consideration the water quality standards of downstream waters and shall ensure that its water quality standards provide for the attainment and maintenance of the water quality standards of downstream waters.”

EPA (Grubbs 2001) provides additional guidance stating:

“...even if a state identifies waters that are not threatened or impaired from nutrient overenrichment, they should also consider whether the nutrient levels in this waterbody could contribute to an impairment downstream before determining that nutrient criteria are not needed. If it is likely that a downstream impairment is occurring, yet quantified criteria in downstream waters have not been established, then a state/tribe should consider employing nutrient load reduction strategies for the upstream waters. EPA recommends that these nutrient load reduction strategies are effective ways of reducing the effects on downstream uses, prior to adopting any specific nutrient criteria values.”

Colorado’s timeline with regard to nutrient criteria includes developing interim measures by December 2004 that will provide nutrient triggers and screening-level measures such as add-on narratives to the Basic Standards and site-specific standards through the 303(d) listing process. Current timelines identify the 2010 Basic Standards Rulemaking Hearing as the target date for adopting nutrient criteria into the state standards (CWQCD 2002).

Sediment Deposition

In May 2002, the CWQCD, CWCC, and the Colorado Sediment Task Force released the “Provisional Implementation Guidance for Determining Sediment Deposition Impacts to Aquatic Life in Streams and Rivers,” building upon draft guidance originally issued in 1998. This guidance provides an interpretation of the CWQCC’s “narrative standards” as they apply to sediments which may form deposits detrimental to the attainment of aquatic life uses, as described in the Basic Standards and Methodologies for Surface Water, Regulation 31 (5CCR 1002-31). The guidance is intended as a first step toward providing a consistent approach to implementation of the statewide narrative basic standard that addresses sediment deposition, which is an important cause of impacts to aquatic life. The guidance applies to “substances, primarily sediment caused by human induced erosion, which create a stress to aquatic life through the deposition of materials.” The guidance provides a means for the CWQCD and the CWQCC to consider the impacts of bottom deposits on the attainment of the aquatic life uses, particularly with regard to assessing the status of water quality as required in §305(b) of the federal Clean Water Act, and establishing a listing of waterbodies requiring TMDLs under §303(d) of the Act (CWQCC et al. 2002). Because stormwater can be a leading contributor of sediments to streams, Denver should actively participate in activities that involve development of guidance and regulations related to the sediment narrative standard.

Pollutant Trading

Pollutant trading is a concept being explored by the CWQF and the CWQCD. The concept is also defined by EPA (2003) in its “Water Quality Trading Policy.” Various pollutant-trading programs in Colorado have focused primarily on lakes and reservoirs such as phosphorus trading programs in Lake Dillon and Cherry Creek Reservoir and a relatively young selenium-trading program in the Grand Valley. The CWQCD is in the process of developing the state “Water Quality Trading Guidance” document that includes topics such as pre- and post-TMDL trading. Progress on this document has potential relevance to Denver’s stormwater discharges for streams with TMDLs.

SUMMARY

As is the case with cities throughout the U.S., Denver is faced with complex regulatory requirements with regard to water quality. The Phase I CDPS permit specifies stringent requirements with which Denver must comply or face significant penalties. Fortunately, Denver already has many sound water quality requirements in place in the form of policies and regulations. It will be imperative for Denver to continue to actively interface with regional water quality efforts and to stay abreast of forthcoming regulatory changes.

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