

Chapter 4

RELATIONSHIP TO OTHER DOCUMENTS

Denver has completed multiple documents that provide important interfaces with water quality planning. Some of the key documents, which were completed either by Denver or related entities, are briefly summarized in this chapter, including:

- ▶ *Urban Storm Drainage Criteria Manual, Volumes 1-3*
- ▶ *Denver Storm Drainage Design and Technical Criteria Manual*
- ▶ *Denver Storm Drainage Master Plan and other drainage master plans*
- ▶ *Standards, details and technical criteria documents*
- ▶ *Metro Vision 2020 and the Clean Water Plan*
- ▶ *Water Quality Improvement in the South Platte River, Report to the Mayor*
- ▶ *Denver Comprehensive Plan 2000*
- ▶ *Blueprint Denver*
- ▶ *Denver Parks and Recreation Game Plan*
- ▶ *Natural Areas Program Field Guide*
- ▶ *Design Guidelines for Stapleton Water Quality*
- ▶ *Long Range Management Framework South Platte River Corridor*
- ▶ *Cherry Creek Greenway Corridor Master Plan*
- ▶ *Cherry Creek Watershed Smart Growth for Clean Water Report*
- ▶ *Lake Management and Protection Plan*

Basic familiarity with these documents is important to this Plan for several reasons. The first four documents listed identify already-established, accepted criteria and strategies for managing stormwater in the Denver area. This Plan does not reinvent the wheel with regard to these documents, rather it builds upon them. Documents such as the *Denver Comprehensive Plan 2000*, *Blueprint Denver*, and the *Denver Parks and Recreation Game Plan* summarize some of the existing goals of various city departments with which this Plan must interface in order to be most effective. Documents such as *Metro Vision 2020*, the *Clean Water Plan*, the *Long Range Management Framework South Platte River Corridor*, the *Cherry Creek Greenway Corridor Master Plan*, *Cherry Creek Watershed Smart Growth for Clean Water*, and *Natural Areas Program Field Guide* are an important interface with regard to regional water quality goals and goals for specific river corridors. The *Lake Management and Protection Plan* is important because it provides the framework for maintenance and protection of Denver lakes. *Design Guidelines for Stapleton Water Quality* is included because this Plan builds upon many of the strategies developed and accepted in the Stapleton guidelines. Highlights of each of these documents follow.

URBAN STORM DRAINAGE CRITERIA MANUAL, VOLUMES 1-3

The Urban Drainage and Flood Control District (UDFCD) was established by the Colorado legislature for the purpose of assisting local governments in the Denver metropolitan area with multi-jurisdictional drainage and flood control problems. Since 1969, UDFCD has maintained and distributed the *Urban Storm Drainage Criteria Manual*, which consists of three volumes.

Volumes 1 and 2 (UDFCD 2001) provide guidance for planning and design of drainageway channels, storage facilities, culverts, hydraulic structures, and other structures. Volume 3 (UDFCD 1999) provides guidance for the selection and design of stormwater quality BMPs. The policies and design criteria set forth in these documents are the foundation of the stormwater BMP information provided in this Plan.

Since the primary focus of this Plan is stormwater quality management, the topics covered in Volume 3 are particularly salient and include:

- ▶ General principles of stormwater quality management
- ▶ Guidance for BMP planning for new development and redevelopment
- ▶ Structural BMP design criteria, details and forms to facilitate design
- ▶ BMP maintenance recommendations
- ▶ Recommended BMPs for industrial and commercial sites
- ▶ Nonstructural BMPs
- ▶ Construction-phase BMPs, including erosion and sediment control

The basic philosophy of stormwater quality management presented in Volume 3 is based on this four-step process:

1. Employ runoff reduction practices such as reducing paved area, providing grassed buffers and swales, and “minimizing directly connected impervious area” (MDCIA).
2. Provide treatment for the “water quality capture volume” (WQCV) through implementation of various BMPs that detain or infiltrate runoff.
3. Stabilize downstream drainageways.
4. Provide BMPs for specific industrial and commercial uses.

More detail on these practices and their applications in Denver is provided in Chapter 6 of this Plan.

DENVER STORM DRAINAGE DESIGN AND TECHNICAL CRITERIA MANUAL

In 1999, Denver updated the *City and County of Denver Storm Drainage Design and Technical Criteria Manual*. (Note: This Manual is being updated again in 2005.) This manual provides the minimum design and technical criteria for the analysis and design of storm drainage facilities. The criteria require that all subdivisions, re-subdivisions, planned unit developments, or any other regulated proposed development provide adequate storm drainage system analysis and appropriate drainage system design in accordance with the manual requirements, which are consistent with UDFCD’s *Storm Drainage Criteria Manual*. Denver’s manual provides drainage plan submittal requirements along with drainage policies and floodplain regulations of the city. The manual then provides engineering criteria for topics such as rainfall/design storms, runoff, open channel design, storm sewers, storm sewer inlets, streets, culverts, hydraulic structures, erosion control, detention and standard forms for use in design. The manual provides specific

design standards for flood detention in open space, parking lots and underground facilities. The manual refers the user to the *Urban Storm Drainage Criteria Manual, Volume 3* (UDFCD 1999) for addressing water quality requirements.

DENVER STORM DRAINAGE MASTER PLAN AND OTHER DRAINAGE MASTER PLANS

In December 2003, Denver completed the first phase of a three-phase *Storm Drainage Master Plan* (Matrix 2003), which identifies capital improvements related to flood hazard reduction and improving drainage conveyance for 15 major drainage basins within Denver. The document will help Denver comply with its stormwater permit because it provides an inventory of stormwater systems and recommends regional capital improvements. The *Storm Drainage Master Plan* also integrates several different documents and programs into a comprehensive Public Works management program. Although the *Storm Drainage Master Plan* does not address stormwater quality issues, its comprehensive GIS mapping, database, hydrology and report provide a strong base of information useful to this Plan. In particular, a description of the drainage basins in the *Storm Drainage Master Plan* is provided in Chapter 2 along with opportunities for integration of regional stormwater quality facilities in Chapter 8.

Working with UDFCD, Denver has also completed multiple drainage master plans for specific drainage basins. These plans are important to water quality planning and should be referenced with regard to stormwater-related improvements in various drainage basins. As examples, three particularly relevant plans include:

- ▶ *Preliminary Design Report for the Upper Central Platte Valley South Platte River Restoration* (McLaughlin Water Engineers 1998). The plan covers a one-mile reach of the South Platte River directly west of downtown between 8th Avenue and I-25. The goals of this plan include: flood damage reduction, elimination of Zuni Power Plant dam, fish habitat improvements, recreation improvements, wildlife habitat and wetland improvements, and improved access.
- ▶ *Stormwater Outfall Systems Plan Stapleton Area* (McLaughlin Water Engineers 1995). This plan provides a comprehensive plan for development of a drainage outfall system to serve the Stapleton redevelopment area. Primary streams addressed include Sand Creek and Westerly Creek.
- ▶ *Major Drainageway Planning South Platte River, Chatfield Dam to Baseline Road, Phases A and B* (Wright Water Engineers 1984). This three-volume series covers a 40-mile reach of the South Platte River from the Chatfield Dam to the City of Brighton. The purpose of Phase A of the report was to develop alternatives to solve flooding problems, while maintaining a balance of different uses of the river such as water supply, recreation and open space, to name a few. Phase B of the report provided preliminary designs for engineering and flood-related aspects of the river and a master plan for recreation, landscaping, and wildlife along the corridor.

STANDARDS, DETAILS AND TECHNICAL CRITERIA DOCUMENTS

Denver has several existing documents that specify standards, details and other technical criteria that may be applicable to stormwater BMP and site designs and should be adhered to as appropriate. These documents include:

- ▶ *Storm Drainage and Sanitary Construction Detail and Technical Specifications* (City and County of Denver Department of Public Works Engineering Division 2003)
- ▶ *Standards and Details for City Engineering, Section I, Minor Projects* (City and County of Denver Department of Public Works Engineering Division 2002)
- ▶ *Standard Details* (City and County of Denver Department of Public Works Wastewater Management Division 1995)

METRO VISION 2020 AND THE CLEAN WATER PLAN

Metro Vision 2020 (DRCOG 1998) is the long-range growth strategy for the Denver region. (Note: *Metro Vision 2030* was being completed concurrently to development of this Plan and should be referenced for possible changes.) It examines both the current and preferred pattern of development to the year 2020. One of the six core values included in *Metro Vision 2020* is environmental quality. The plan acknowledges that the location and type of growth and land development have significant effects on air and water and that these issues are truly regional in nature. The *Clean Water Plan* was identified as the mechanism by which regional water quality issues should be addressed (DRCOG 1998).

The Denver Regional Council of Governments (DRCOG) 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 Section 208 of the federal Clean Water Act. The most recent update to the *Clean Water Plan* is titled *Metro Vision 2020 Clean Water Plan Policies, Assessments and Management Programs* (DRCOG 1998). The document describes wastewater management strategies, watershed water quality programs, nonpoint source control strategies, stormwater management programs, wasteload allocations, stream standards and priority regional projects. The plan covers a 25-year planning process with additional wastewater treatment facility planning data for up to a 50-year horizon. The *Clean Water Plan* also provides a regional context for protecting and maintaining water quality through integrated watershed management processes (DRCOG 1998). The BMPs and other water quality measures proposed in this Plan should be consistent with the measures identified in the *Clean Water Plan*.

The *Clean Water Plan* states that the goal for the region is “to restore and maintain the chemical and physical integrity [of waterbodies] in order to assure a balanced ecological community in waters associated with the region.” Five key objectives were adopted as part of *Metro Vision 2020* to support a proactive “bottom-up” planning process with regional coordination, including:

1. A locally defined balanced ecological community will be achieved through implementation of water quality protection and appropriate water resource management

initiatives, provided that a balance will be maintained between the natural environment and those designated uses of the resource.

2. The chemical and physical integrity of the region's aquatic environments will be restored and maintained through a coordinated watershed management process.
3. Effective wastewater treatment will be identified through a regional process, with local implementation of wastewater management strategies.
4. Effective and balanced stormwater and nonpoint source management will best be achieved through local implementation processes.
5. Effective and cost-efficient water quality management and supply will require an integrated resource management program.

One of the key strategies identified in the *Clean Water Plan* for water quality protection is watershed planning. The document recognizes eleven designated watersheds, three of which receive runoff from Denver, primarily the South Platte Urban and Cherry Creek watersheds, and, to a lesser extent, Box Elder Creek. The document provides a summary of water quality and regulatory information relevant to each of these watersheds that should be considered for future water quality planning in these areas.

WATER QUALITY IMPROVEMENT IN THE SOUTH PLATTE RIVER, REPORT TO THE MAYOR

Concurrent to the development this Plan, the Mayor's Office commissioned an evaluation of information regarding water quality in the South Platte River through Denver, which culminated in the report *Water Quality Improvement in the South Platte River, Report to the Mayor* (Bergstedt 2004). The findings of that report parallel and support the recommendations contained in this Plan. Bergstedt's report is provided in Appendix C of this Plan, with key recommendations paraphrased as follows:

1. Increased communication and streamlining of procedures between various departments with responsibilities affecting the South Platte River is needed.
2. Long-range regional initiatives and near-term program support with regard to stormwater inputs to the river are necessary to adequately protect water quality in the river.
3. Recommendations related to regional stormwater initiatives include:
 - a. Promote a Denver-inspired regional watershed initiative, building on existing efforts (including this Plan).
 - b. Enforce existing stormwater ordinances with regard to installation and maintenance of BMPs.

- c. Fund and empower the Natural Areas Program to help reduce contamination before it reaches the river.
4. To address sewerage infrastructure and contamination issues:
 - a. Pursue additional storage in Chatfield Reservoir for additional base flow storage and timely water releases to promote dilution of sewer discharges, particularly during drought conditions.
 - b. Continue to support water quality improvement efforts of wastewater treatment plants discharging to the river.
 - c. Continue diligent monitoring, improvement and coordination efforts related to the sanitary sewer system, especially in northwest Denver.

DENVER COMPREHENSIVE PLAN 2000

The *Denver Comprehensive Plan 2000: A Vision for Denver and Its People* provides a comprehensive framework for addressing long-term issues such as environmental sustainability, land use, mobility, Denver’s legacies, housing, economic activity, neighborhoods, education, human services, arts/culture, and metropolitan cooperation. The *Denver Comprehensive Plan 2000* then outlines a long-term implementation strategy to achieve the goals identified for each of these issues. One of the primary goals with regard to Denver’s long-term physical environment is environmental sustainability, specifically “preserving and enhancing the natural environment.” The *Denver Comprehensive Plan 2000* states:

Denver’s relationship with the environment is above all a matter of balance. Clean water, clean air, clean parks and streets, efficient use and reuse of resources, and protection of the mountain parks and open spaces must be abiding goals.

Most basic to sustainable quality of life in Denver and the region are the land we live on, the air we breathe, the water we drink and the natural beauty we enjoy. The greatest challenge to the environment in the early 21st century is managing growth—slowing the loss of land, the consumption of resources, the congestion, and the human stress created by urban sprawl. At the same time, the public-policy challenge to develop and implement balanced and sustainable growth strategies addressing equity, stewardship and cooperation becomes more critical.

As part of its “Vision of Success” for environmental sustainability, the following selected statements pertaining to water quality are provided:

Exhibit 4.1
Comprehensive Plan 2000



- ▶ **Water Quality:** Water quality will improve, and waterways and groundwater will be cleaned up and “greened” up.
- ▶ **Pollution Prevention:** More residents and businesses will be directly involved in voluntary pollution prevention programs, reducing the need for government intervention.
- ▶ **Natural and Wildlife Habitat:** Denver’s natural stream corridors and wetlands will be preserved and maintained for wildlife habitat.

Five specific objectives with supporting strategies are identified to achieve the goal of environmental sustainability. These objectives are listed below, along with some selected implementation strategies specifically relevant to water quality planning.

Objective 1: Burdens and Benefits—Distribute environmental burdens and benefits.

- ▶ Encourage redevelopment of vacant, underutilized and environmentally compromised land known as brownfields.
- ▶ Promote public-private sector involvement and cooperation with citizens to formulate plans and actions that achieve shared responsibilities and benefits.
- ▶ Continue to implement the environmental review function as a tool to address pollution prevention and improve environmental quality.

Objective 2: Stewardship of Resources—Ensure environmental stewardship of natural resources, taking into account the entire ecosystem, not just human needs. Preventing pollution will be the action of first choice in accomplishing this objective.

- ▶ Promote environmental sustainability within neighborhoods by educating and encouraging residents to adopt environmentally friendly ways of living, such as recycling, water conservation, use of renewable resources, and low-impact methods of transportation.
- ▶ Conserve water and improve water quality by...identifying opportunities for City agencies to use native flora in landscape designs.
- ▶ Conserve land by:
 - Promoting infill development within Denver at sites where services and infrastructure are already in place.
 - Designing mixed-use communities and reducing sprawl, so that residents can live, work and play within their own neighborhoods.
 - Adopting construction practices in new developments that minimize disturbance of the land.

- Protecting natural corridors, wetlands and floodplains from the encroachment of development.
- Encouraging the redevelopment of brownfields.
- ▶ Preserve and restore, wherever possible, natural habitat for wildlife and plants native to the region, such as those at the Rocky Mountain Arsenal National Wildlife Area, Bear Creek Park, Bear Valley Park, and the Cherry Creek corridor.

Objective 3: Environmental Policy—Develop environmental protection policies that take advantage of market forces and provide for regulatory flexibility while meeting the City’s environmental objectives. Encourage policies and actions that consider environmental quality, economic prosperity, and social equity as complementary, not conflicting, goals.

- ▶ Establish specific measurable goals for the environment, formulate strategies to accomplish them, and create timelines for implementation.
- ▶ Encourage decision-making throughout Denver government that recognizes long-term impacts on the environment, such as making lifecycle cost analysis the basis for economic decisions.
- ▶ Adopt procedures and regulations that are appropriate to the nature and scale of problems and that reduce waste.
- ▶ Provide market-based incentives and tax incentives to encourage sustainable development.
- ▶ Encourage effective voluntary environmental management programs and activities that require less government intervention. The private sector has found pollution prevention to be profitable, and many businesses are voluntarily embracing opportunities to create a more sustainable environment.

Objective 4: The Environment and the Community—Achieve environmental sustainability in all aspects of planning, community and building design, and transportation. Encourage implementation of recommended strategies within neighborhoods, citywide, and throughout the metropolitan region.

- ▶ Respect, conserve and expand wildlife habitat, watersheds, open space and other natural resources when planning, designing and building new projects.
- ▶ Use neighborhood development, such as Stapleton, as projects that incorporate principles of sustainable development at the community level. Use these neighborhoods as models to encourage sustainable development throughout the city over time.
- ▶ Introduce natural ecosystem strategies into the maintenance of our public and private lands.

Objective 5: The Environment and the Region—Encourage the broad participation and cooperation of the entire metropolitan community on environmental sustainability issues, including transit, air and water quality, protection of floodways and wildlife habitat, and recreational areas and bike paths.

- ▶ Support and use DRCOG’s *Metro Vision 2020* Plan, which has been incorporated into *Denver Comprehensive Plan 2000*.
- ▶ Continue Denver’s leadership in metropolitan forums on smart growth, air quality, water, energy, natural resources and wildlife, recycling, climate, and other key environmental issues.
- ▶ Partner with other metropolitan jurisdictions to distribute environmental burdens and benefits.
- ▶ Cooperate with neighboring jurisdictions to develop shared open space and outdoor recreation amenities.
- ▶ Maintain existing connections and develop new connections among open space areas within Denver and with those of our neighbors.

BLUEPRINT DENVER

Blueprint Denver, An Integrated Land Use and Transportation Plan (Denver 2000) presents a planning and development strategy “for improving Denver by shaping the places where we live, travel, work, shop and play.” *Blueprint Denver* serves as the first step in implementing and making concrete the vision outlined in *Denver Comprehensive Plan 2000*. *Blueprint Denver* adheres to and promotes five elements in *Metro Vision 2020*, as paraphrased below:

- ▶ Adhere to an established urban growth boundary.
- ▶ Provide substantial open space.
- ▶ Provide a balanced, multi-modal transportation system.
- ▶ Provide urban centers, such as Downtown and Cherry Creek.
- ▶ Support sustainable development to protect regional air and water quality.

A central concept of *Blueprint Denver* that is directly relevant to this Plan is the goal of directing growth to “Areas of Change” and managing and limiting growth in “Areas of Stability.” Areas of Stability include the vast majority of Denver and are primarily the fairly stable residential neighborhoods where minimal change is expected during the next 20 years. The goal is to maintain the character of these areas, yet accommodate some new development and redevelopment to prevent stagnation. Meanwhile, the vast majority of new development will be funneled to areas that will benefit from and thrive on an infusion of population, economic activity and investment; these places are Areas of Change (Denver 2000). These Areas of

**EXHIBIT 4.2
BLUEPRINT DENVER AREAS OF CHANGE**

DISTRICTS

- DOWNTOWN
- CHERRY CREEK
- LOWRY
- STAPLETON
- GATEWAY

NEIGHBORHOODS

- BRIGHTON BOULEVARD
- NORTHEAST DOWNTOWN
- JEFFERSON PARK-HIGHLAND

TRANSIT-ORIENTED DEVELOPMENT

- WEST COLFAX LIGHT RAIL STATION AREA
- GATES LIGHT RAIL STATION AREA (I-25/BROADWAY)
- SOUTHEAST LIGHT RAIL CORRIDOR
- WEST EVANS LIGHT RAIL CORRIDOR

TOWN CENTERS

- ALAMEDA TOWNCENTER

CORRIDORS

- WEST 38TH PEDESTRIAN SHOPPING CORRIDOR
- MORRISON ROAD PEDESTRIAN SHOPPING CORRIDOR
- EAST COLFAX (LINCOLN TO COLORADO) PEDESTRIAN SHOPPING CORRIDOR
- THE CENTRAL INDUSTRIAL AREA RIVER CORRIDOR
- SOUTH FEDERAL BOULEVARD COMMERCIAL CORRIDOR
- HAMPDEN COMMERCIAL CORRIDOR
- EAST COLFAX (EAST OF COLORADO BLVD)

COMMERCIAL CORRIDOR

- SOUTH BROADWAY COMMERCIAL CORRIDOR

Change will provide the most opportunities for implementing new and/ or improved stormwater-related infrastructure and BMPs. Although 26 specific Areas of Change are identified in *Blueprint Denver* (see Exhibit 4.2), these can be lumped into three general categories:

- ▶ Downtown
- ▶ Large development areas such as Lowry, Stapleton and Gateway
- ▶ Areas where land use and transportation are closely linked

Another key aspect of *Blueprint Denver* is its definitions of land-use building blocks. Adoption of these building blocks into this Plan will help to promote better interfacing among multiple departments as part of the planning and development review process. The land-use building blocks defined in *Blueprint Denver* include:

- ▶ Districts (types: downtown, employment, industrial, campus, entertainment/cultural/civic and parks and open space)
- ▶ Residential areas (types: mixed-use, urban residential, single-family/duplex residential, and single-family residential)
- ▶ Centers (types: regional center, town center, neighborhood center, and transit-oriented development)
- ▶ Corridors (types: pedestrian, shopping, commercial)

Finally, *Blueprint Denver* recognizes the critical role that land-use regulations play in shaping development and ensuring that development fits into the public infrastructure. *Blueprint Denver* also identifies various development standards that impact site designs including factors such as setbacks, parking locations, off-street parking

requirements, and landscaping, among others. These requirements have the potential to impact locations and space allocated to water quality treatment facilities. As part of *Blueprint Denver*, significant revisions to zoning and development standards are recommended. Ideally, water quality treatment requirements could be integrated into future changes to these regulations, standards, and design review process.

DENVER PARKS AND RECREATION GAME PLAN

In 2003, Denver completed the *Denver Parks and Recreation Game Plan: Creating A Strategy for Our Future*, which provides a master plan for Denver’s parks and recreation future. The *Denver Parks and Recreation Game Plan* was created through a two-year public process and provides a 50-year vision and strategic framework plan for transforming Denver into a “City in a Park.” The proposed physical plan to create a City in a Park is organized into three sections, according to a scale that moves from home and neighborhood to Denver’s park and open space role in the region. Design ideas, planning and process principles, supporting analyses, measurable indicators, standards or benchmarks, and cost estimates are provided. As a master plan, the *Denver Parks and Recreation Game Plan* makes few specific recommendations for individual parks. Rather, it provides an overall assessment of the park system and a framework for making decisions.

The *Denver Parks and Recreation Game Plan* reflects city residents’ desire for diverse recreational experiences along Denver’s waterways such as canoeing, kayaking, green connections to the water’s edge, and new parkway connections next to the water, especially along the Platte at South Platte River Drive. Residents are also interested in more opportunities to learn about water quality, native landscapes, and wildlife. Both natural areas and active parks supporting recreation are desired.

Several specific goals identified in the *Denver Parks and Recreation Game Plan* that are beneficial in terms of stormwater quality management include:

- ▶ Provide a tree-canopy cover of 15 to 18 percent in urban residential areas and 10 percent in the central business district by 2025.
- ▶ Provide at least one-half acre of public open space within one-half mile of every resident’s home that can be reached without crossing a major barrier.
- ▶ Provide 8-10 acres of parkland for every 1,000 residents.
- ▶ Provide significant natural area acreage in each quadrant of the city.

Exhibit 4.3
Denver Parks and Recreation Game Plan



- ▶ Encourage more natural open space in the design of new parks and the retrofitting of established parks.
- ▶ Restore and protect existing natural open spaces.
- ▶ Install a detached sidewalk with tree lawn where feasible; tree lawns should be at least 8 feet wide.
- ▶ Ensure safe access to urban waterways from major residential areas.
- ▶ Expand natural open space along the Platte, Cherry Creek, and the gulches, improving habitat for urban wildlife.
- ▶ Increase the number and range of parks along the waterways, including some larger parks that support active recreation.
- ▶ Identify priority corridors and areas needing protection or preservation, including: the Cherry Creek Corridor; First, Second and Third Creeks; Westerly Creek; and eastern drainageways connecting Aurora Reservoir with Rocky Mountain Arsenal.

Many of the long-term goals presented in the *Denver Parks and Recreation Game Plan* are beneficial to stormwater quality management. This Plan should reinforce these goals and seek opportunities for mutually beneficial projects.

NATURAL AREAS PROGRAM FIELD GUIDE

The *Natural Areas Program Field Guide* (Denver Parks and Recreation 2004) is currently being developed to educate Denver staff and citizens about the purpose and activities of the Denver Natural Areas Program. The guide helps citizens and Denver staff understand how their activities affect natural areas and wildlife. The guide is divided into the following eight sections: rivers; creeks and other waterways; wetlands; prairies and grasslands; woodlands and forests; wildlife and wildlife habitats; community participation; and good land stewardship.

DESIGN GUIDELINES FOR STAPLETON WATER QUALITY

In 2001, the Denver Planning Board adopted the *Design Guidelines for Stapleton Water Quality: Patterns for Integrating Water Quality Treatment into the Community, An Addendum to the Stapleton Rules and Regulations*. This document provided specific guidelines for developing water quality controls adapted to the highly urbanized setting of the Stapleton Redevelopment area. Parcel-specific BMPs were developed along with a set of details that identified specific opportunities for water quality treatment. Both structural and non-structural BMPs were identified. The document also emphasized opportunities of integrating regional water quality and quantity stormwater controls.

In many ways, the *Design Guidelines for Stapleton Water Quality* laid the foundation for this Plan. A few selected guiding principles of *Design Guidelines for Stapleton Water Quality* that are instructional for this Plan include:

- ▶ Supporting the precepts of the related Stapleton drainage and development plans and Denver’s stormwater permit.
- ▶ Providing development parcel BMPs that respect the design requirements and challenges of urban development.
- ▶ Providing an appropriate combination of structural and nonstructural BMPs that work at the site.
- ▶ Creating designs that promote a healthy aquatic ecology, provide for sustainability, and minimize maintenance and human intervention.

LONG RANGE MANAGEMENT FRAMEWORK SOUTH PLATTE RIVER CORRIDOR

In 2000, the Mayor’s South Platte River Commission completed the *Long Range Management Framework South Platte River Corridor* for the purposes of providing a framework for future decision-making and management of the 10.5-mile South Platte River Corridor within Denver’s boundaries. The corridor includes 330 acres of land and water within the 100-year floodplain of the South Platte River. The document is intended to provide guidance for continued multi-objective management and project coordination in the corridor. Conclusions and recommendations were developed in four key areas, as summarized in the document’s Executive Summary:

1. **Development of a Vision and Management Philosophy:** An update of the original vision statement developed by the Mayor’s South Platte River Commission in 1995 was defined as:

We want the South Platte River Corridor to be known and cherished by the citizens of the City and County of Denver. If we care for our River, protect its natural resources and help restore its beauty and quality, the South Platte will provide present and future generations unmatched opportunities for recreation, education and enjoyment.

In addition to the vision statement, the Commission also recommended that the City designate and manage the entire Corridor (as defined in the Greenway Ordinance) as a City “Active Use” Natural Area, with Conservation and Preservation Natural Area designations to be applied to areas needing special protection. It was further recommended that an Adaptive Management approach be applied to overall corridor management, whereby management of land and water resources toward identified goals is continually monitored, evaluated and adapted to integrate best management practices and to respond to changing conditions over time.

2. **Identification of a Management Structure:** Create a South Platte River Corridor Council made up of all major city agencies working on the River, as well as a number of other stakeholder groups. This advisory group should be empowered by ordinance,

- and initially staffed administratively out of Denver Parks and Recreation. It should be co-chaired and convened by the Manager of Parks and Recreation and a community leader appointed by the Mayor. It will meet quarterly to review and make recommendations on all activities taking place on the River Corridor. It will also engage subcommittees to address a variety of topics needing more detailed attention (e.g., water quality, regional cooperation).
3. **Achievement of an Integrated and Balanced Management Approach:** Use the carefully developed and agreed-upon Guiding Principles and Goals and Objectives laid out in the document as a framework for management decisions. The goals and objectives address multiple issues such as wildlife, recreation, water quality and flood control issues, public safety, regional cooperation and partnership, and public involvement.
 4. **Develop Resources Necessary to Meet the Challenges:** Through the creation of the South Platte River Corridor Council and the initiatives of its members, work collaboratively to identify and attract funding for multi-objective projects. Wherever possible, utilize partnerships with existing non-profits and others to support and build upon programs that meet common goals and objectives.

CHERRY CREEK GREENWAY CORRIDOR MASTER PLAN

Cherry Creek, from the Cherry Creek Reservoir to its confluence with the South Platte River in downtown Denver, meanders through twelve miles of diverse vegetation and wildlife habitats, rural, suburban, and urban developments, three governmental jurisdictions, seven neighborhoods, and public as well as privately-controlled lands (BRW 2000). As one of the last remaining natural environments within an otherwise urbanized setting, the Cherry Creek corridor provides a unique opportunity to become one of the metropolitan area's major open space resources. The *Cherry Creek Greenway Corridor Master Plan* (BRW 2000), also referred to as the Cherry Creek South Corridor Master Plan Report, provides an overall master plan for the eight-mile portion of Cherry Creek between University Boulevard and the Cherry Creek Dam. Two of the primary purposes of the plan are to “firmly establish the long-term protection and enhancement of its environmental resources” and “expand opportunities for open space.” This plan should be taken into account with regard to stormwater quality planning in the Cherry Creek corridor area.

Exhibit 4.4
Cherry Creek Stewardship
Partners Plays an Important Role
for Cherry Creek



CHERRY CREEK WATERSHED SMART GROWTH FOR CLEAN WATER REPORT

Denver continues to be very involved in the planning and implementation of regional watershed and water quality-based land-use initiatives in the Cherry Creek Basin. Historically, the Cherry

Creek Stewardship Partners had operated successfully as an informal coalition of interests from throughout the watershed. The work of the partners culminated in 2002 with the completion of the *Cherry Creek Watershed 'Smart Growth for Clean Water' Report* (Cherry Creek Stewardship Partners 2003) and the *Cherry Creek Basin Open Space, Conservation and Stewardship Plan* (The Trust for Public Land 2002). These plans engaged a broad cross-section of interests within the watershed and specified goals and objectives for realizing land protection and water quality goals. Some of the key findings of the Smart Growth for Clean Water project included:

- ▶ The practice of engaging the development community, local land use agencies and interested citizens in the watershed planning process is a key component of making “smart growth for clean water” techniques viable in a watershed.
- ▶ There are excellent data sources available on conditions in the Cherry Creek watershed.
- ▶ The watershed can go beyond the level of water quality enhancement mandated by existing regulations.
- ▶ There are available solutions that can be implemented to minimize or remove barriers that block implementation of smart growth practices within the development community and local government planning agencies.
- ▶ Funding and marketing options exist that can provide economic incentives for innovative planning and design and help fund water quality projects.

LAKE MANAGEMENT AND PROTECTION PLAN

Denver has many agencies that are concerned with maintaining the functions of the lakes within the city. The agencies tackle the issues based upon their specific mission. The purpose of the *Lake Management and Protection Plan*, which was written concurrently with this Plan, is to provide these agencies with a document that summarizes the conditions of the lakes, discusses potential overlap or conflict between various issues/uses for the lakes and identifies future strategies that the agencies can implement (Dudley 2004).

Exhibit 4.5
Wetland Portion of Lake in Garland Park



More specifically, the plan documents the history and current status of the lakes in Denver parks. This includes basic location, size, and depth information, and as much information on uses and overall health of the lakes as could be documented. Historical records concerning improvement projects, as well as planned improvement projects, are also included. The primary challenges for

managing and protecting the lakes are discussed (e.g., habitat, water quality, geese) and similarities or conflicts among these challenges are evaluated. The plan provides potential near- and long-term strategies for enhancing and protecting the lakes, emphasizing sustainable strategies (Dudley 2004).

The *Lake Management and Protection Plan* has direct relevance to this Plan in terms of maintenance of ponds with stormwater functions (Chapter 6), as well as with regard to potential future watershed-by-watershed assessments described in Chapter 9.

SUMMARY

Denver has completed multiple planning and technical criteria documents that are directly relevant to stormwater quality planning. It is important that this Plan be consistent with the principles, criteria, and priorities included in these documents and recognize that strong coordination among Denver departments is essential for long-term success.