

DRAFT 7/31/14

GUNNISON BASIN IMPLEMENTATION PLAN



Prepared for:

The Gunnison Basin Roundtable

For submittal to:

The Colorado Water Conservation Board

July 31, 2014

Executive Summary



Objectives

This report is designed to follow the framework of the Basin Implementation Plan Guidance (December 10, 2013) provided by the Colorado Water Conservation Board. Application of the guidance to local issues in the Gunnison Basin and preparation of the report was overseen by the Gunnison Basin Roundtable and its Basin Implementation Plan Subcommittee. To improve consistency, coherence, and relevance to local issues some sections of the plan were restructured as appropriate. According to the Guidance:

“The purpose of the Basin Implementation Plans is for each basin [roundtable] to identify projects and methods to meet basin-specific municipal, industrial, agricultural, environmental, and recreational needs. The Basin Implementation Plans will inform and help drive Colorado’s Water Plan.”

The Gunnison Basin Roundtable is pleased to submit this Basin Implementation Plan for inclusion into the Colorado Water Plan process. The projects identified in this report meet a variety of important needs in the Basin. Every effort was made to recognize the most appropriate goals, projects, and strategies to address the Basin’s priorities. Despite the best efforts to comprehensively address water needs in the Basin, given the accelerated deadline and resource constraints, this report inevitably falls short of adequately identifying all projects and issues in the Basin. It is also important to note, due to the inherent tradeoffs surrounding water use in Colorado all priorities and projects documented in this report are not equally and unanimously supported by all members of the roundtable.

Background

The Gunnison Basin Implementation Plan (GBIP) was created by the Gunnison Basin Roundtable (GBRT) for submittal to the Colorado Water Conservation Board (CWCB). It is designed to support regional water planning through the roundtable process established by the Colorado Water for the 21st Century Act. The GBIP builds on previous roundtable work to propose and fund projects for meeting water needs. The GBIP also provides critical grassroots input to the forthcoming Colorado Water Plan (CWP).

To encourage locally-driven and balanced solutions to water supply challenges, the plan identifies water projects through targeted analyses of water issues in the Basin. The GBIP includes analyses of water shortages, water availability under variable hydrologic conditions, and various site-specific water supply issues. The ultimate purpose of the plan is to better identify water priorities in the Basin and highlight proposed projects that will excel at meeting these priorities in the near future.

The GBIP process continues the important public education, participation, and outreach work that the GBRT has been engaged with for almost ten years. The creation of the GBIP included targeted technical outreach to refine information on water needs and projects. It also included public outreach with local stakeholders to gather input on key elements of the report. The GBRT's ongoing outreach and education efforts will be critical throughout the development of the CWP.

The structure of this document generally follows CWCB BIP guidelines with some modifications to better address local issues, streamline the report, and focus on proposed projects.

- **Introduction:** summarizes the current planning process, related outreach, major Basin issues, and available information.
- **Section 1:** defines Basin Goals, Statewide Principles, and corresponding measurable outcomes.
- **Section 2:** summarizes water supply needs in the Basin.
- **Section 3:** describes options to analyze projects and case studies.
- **Section 4:** identifies proposed projects, related constraints, and strategies for implementation.
- **Section 5:** summarizes conclusions and recommendations.

Section 1: Basin Goals

The GBRT identified nine Basin Goals to establish priorities for water development and to maintain and protect the current balance of water use in the Gunnison Basin; each goal is paired with Measurable Outcomes and a process for their achievement to provide a concrete measurement of success (Table 1).

Table 1. Basin Goals

<p>Primary Goal:</p> <ol style="list-style-type: none">1. Protect existing water uses in the Gunnison Basin. <p>Complementary Goals (order does not indicate priority):</p> <ol style="list-style-type: none">2. Discourage the conversion of productive agricultural land to all other uses within the context of private property rights.3. Improve agricultural water supplies to reduce shortages.4. Identify and address municipal and industrial water shortages.5. Quantify and protect environmental and recreational water uses.6. Maintain or, where necessary, improve water quality throughout the Gunnison Basin.7. Describe and encourage the beneficial relationship between agricultural and environmental recreational water uses.8. Restore, maintain, and modernize critical water infrastructure, including hydropower.9. Create and maintain active, relevant and comprehensive public education, outreach and stewardship processes involving water resources in the six sectors of the Gunnison Basin.
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The GBRT also identified seven Statewide Principles (Table 2) to complement Basin Goals and to reflect the GBRT's vision for major water policy issues in Colorado. Basin Goals and Statewide Principles are collectively intended to inform and help drive the Colorado Water Plan as stated in the CWCB's Basin Implementation Plan Guidance Document.

Table 2. Statewide Principles

1. Future supply of Colorado River water is highly variable and uncertain; therefore any proponent of a new supply project from the Colorado River System must accept the risk of a shortage of supply however the shortage occurs, strictly adhere to the prior appropriation doctrine, and protect existing water uses and communities from adverse impacts resulting from the new supply project.
2. It must be explicitly recognized that a new supply development from any location in the Colorado River System affects the entire West Slope, as well as the Front Range diverters.
3. Any new supply project from the Colorado River System must have specifically identified sponsors and beneficiaries, and meet certain minimum criteria.
4. Local solutions must be utilized to meet Colorado’s future water needs without a major state water project or related placeholder water right.
5. Water conservation, demand management, and land use planning that incorporates water supply factors should be equitably employed statewide.
6. Scenario planning should be used as the principal tool for water planning.
7. Statewide discussion, outreach, and education concerning the Gunnison Basin Roundtable’s vision for water development in Colorado should be continued.

Section 2: Basin Needs

The GBRT identified water needs by summarizing corresponding information from existing relevant sources and updates secured through targeted technical outreach with agricultural, municipal, industrial, environmental, and recreational entities.

Agricultural shortages are estimated to be approximately 116,000 AFY by 2050 (Table 3), prompting four primary water management needs, including improving water supply reliability; minimizing loss of agriculture to other uses; rehabilitating key water supply infrastructure, and developing public education programs (Table 4).

Table 3. Agricultural Needs (quantitative)

Analysis	Irrigated Acres	Crop Irrigation Requirement (CIR) (AFY)	Irrigation CU (AFY)	Shortage (AFY)	Non-Irrigation Demand (AFY)
Current	272,000	633,000	505,000	128,000	54,000
2050	244,000 ¹	573,000	457,000	116,000	48,000

Table 4. Agricultural Needs (qualitative)

- ❖ Improve agricultural water supplies to reduce shortages.
- ❖ Consider alternatives to growth patterns and identify creative solutions to minimize loss of agricultural land to other uses.
- ❖ Inventory existing dams, headgates, and canals; assess their current conditions; and prioritize rehabilitation and repairs.
- ❖ Develop an education program to help new irrigators understand how historical practices evolved through experience, and help maximize water available to irrigators throughout each tributary.

Municipal and Industrial (M&I) needs are estimated to be up to approximately 44,000 AFY—a 24,000 AFY increase from current levels—by 2050 (Table 5). These increased needs are generally expected to be managed with sufficient existing supplies and/or planned projects.

Table 5. M&I/SSI Needs

Demand Type	2008	2035	2050 Low	2050 Med	2050 High
M&I	20,000	33,000	36,000	39,000	43,000
SSI	260	650	650	650	650
Total	20,260	33,650	36,650	39,650	43,650

*All values in AFY. Source: SWSI 2010

Environmental and Recreational needs include the identification and inventorying of projects throughout the Basin and in 29 target stream reaches identified by the GBRT, as well as addressing water quality and watershed/forest health issues (Table 6).

Table 6. Environmental and Recreational Needs

Identify and inventory specific projects to address environmental and recreational needs in the following target reaches:

1. Blue Mesa, Morrow Point, Crystal Reservoirs (Aspinall Unit of the Colorado River Storage Project) and Gunnison River in Curecanti National Recreation Area
2. Gunnison River - Almont to Blue Mesa Reservoir
3. Gunnison River in Black Canyon of the Gunnison National Park
4. Gunnison River in Gunnison Gorge National Conservation Area downstream to Confluence with North Fork of the Gunnison River
5. Gunnison River - Confluence with North Fork Gunnison River to Hartland Diversion
6. Gunnison River - Hartland Diversion to Confluence Colorado River
7. North Fork of the Gunnison River - Paonia Dam to Confluence with the Gunnison River
8. Stream Segments on Headwaters Wilderness Areas
9. Coal Creek, Slate River and Tributaries
10. East River - Gothic to Almont
11. Henson Creek and Tributaries
12. Uncompahgre River and Tributaries - Headwaters to Ouray
13. Uncompahgre River - Ouray to South Canal Outfall and West Canal Flume
14. Grand Mesa Reservoirs on National Forest
15. Tributaries to Taylor Park Reservoir
16. Taylor Park Reservoir
17. Taylor River - Taylor Park Reservoir to Almont
18. Lake San Cristobal
19. Lake Fork of the Gunnison River - Lake San Cristobal to Blue Mesa Reservoir
20. Ridgway Reservoir
21. Upper East River and Tributaries - Headwaters to Gothic
22. Tomichi Creek (Sargents to confluence with Gunnison River)
23. Curecanti Creek (headwaters to confluence with Morrow Point Reservoir)
24. Smith Fork Creek
25. Ohio Creek (headwaters to confluence with Gunnison)

26. Cottonwood Creek (included in the Dominguez-Escalante Resource Management Plan)
27. Cow Creek (lower reach—last 5 miles)
28. East and West Dallas Creeks
29. Cimarron River and Blue Creek

Water quality and watershed health needs in the Gunnison Basin:

- CDPHE is implementing further Monitoring and Evaluation (M&E) of specific water quality parameters for 22 water body segments identified by CDPHE in the Gunnison Basin.
- CDPHE is developing Total Maximum Daily Load (TMDL) strategies for specified pollutants within water body segments identified in the Gunnison Basin, including point source projects and other scheduled improvements to help water quality issues.
- CSFS and USFS are addressing forest health projects related to forest management; forest insects, diseases, and disorders; and wildfire mitigation and education.

Section 3: Basin Evaluations

The GBRT used the Gunnison River basin Water Resources Allocation Model, case studies, and mapping overlays to evaluate projects and project constraints. Modeling tools allowed evaluation of impacts to the availability of water to individual users and projects based on variable hydrology, water rights, and operations (e.g., proposed diversions, reservoirs, and management strategies). The modeling tools helped to evaluate five case studies to investigate basin-wide issues and opportunities with specific projects (i.e., water availability analysis, Upper Basin irrigation decrees, agricultural impacts on streamflows, and instream flow analysis). Mapping overlays of project data and Basin needs were used to provide a consistent methodology to review potential projects, highlight options for multi-use projects, and identify projects that may compete for available water.

Section 4: Basin Projects

Projects are the primary focus of the GBIP and the mechanism for addressing Basin Goals. Section 4 summarizes projects highlighted for implementation. Developed in close coordination with the GBIP Subcommittee, the GBRT, and project proponents, the list of proposed projects is considered a current snapshot of potential Basin solutions that should be periodically refined with input from project sponsors. To strategically focus implementation efforts, projects are divided into 3 tiers:

- **Tier 1:** implementation likely feasible by 2020; project does excellent job of meeting Basin Goals.
- **Tier 2:** implementation likely not feasible by 2020; project would excel at meeting Basin Goals. Project may also have important conditional water rights and/or completed planning efforts.
- **Tier 3:** implementation likely not feasible by 2020; project in preliminary stages of planning and/or may meet Basin Goals to lesser degree.

Tier 1 projects are summarized in Table 7 showing which Basin Goals are met by the projects.

Table 7. Proposed Basin Projects

Ref. No.	Project	Basin Goals Met								
		1	2	3	4	5	6	7	8	9
1	Inventory of Irrigation Infrastructure Improvement Needs - District 28	✓		✓		✓		✓	✓	
2	Cole Reservoirs #4 and #5	✓		✓					✓	
3	Crawford Reservoir System Optimization Study and Prioritized Conveyance Improvements	✓		✓					✓	
4	Doughty #1 - Chipmunk Reservoir	✓	✓	✓					✓	
5	Fire Mountain Canal Delivery Efficiency Project	✓		✓					✓	
6	Marcott Reservoir	✓	✓	✓					✓	
7	North Delta Canal	✓		✓					✓	
8	Orchard Ranch Ditch	✓	✓	✓					✓	
9	Overland Reservoir Enlargement (Part 2)	✓		✓					✓	
10	Paonia Reservoir Sediment Removal and Outlet Modification Project	✓		✓					✓	
11	Young's Creek Reservoirs (#1 & #2) Rehabilitation	✓		✓					✓	
12	Granby Reservoirs (#5 and #11) Rehabilitation	✓		✓					✓	
13	Inventory of Irrigation Infrastructure Improvement Needs - District 40, Grand Mesa (Surface Creek)	✓		✓		✓		✓	✓	
14	Inventory of Irrigation Infrastructure Improvement Needs - District 40, Upper North Fork	✓		✓		✓		✓	✓	
15	Rehabilitation/Enlargement-28 Reservoirs LCWUA	✓		✓					✓	
16	Somerset Diversion Improvement	✓		✓	✓	✓				
17	Environmental/Recreational Project Identification and Inventory - North Fork Region	✓				✓		✓		
18	Uncompahgre Valley Water Users System Optimization Projects (Canal Lining and Re-regulation of Reservoirs)	✓		✓					✓	
19	Project 7 - 10 kAF Raw Storage (Part 2)	✓			✓					
20	Redlands Pump Modernization and Hydropower Optimization Project	✓		✓		✓		✓	✓	
21	Dillsworth Ditch	✓	✓	✓					✓	
22	Meridian Lake Reservoir and Washington Gulch Storage Project	✓	✓	✓						
23	Water Conservation Planning Process for the Upper Gunnison Basin	✓			✓					
24	Cunningham Lake Reservoir Rehabilitation	✓	✓	✓				✓		
25	Gunnison Ohio Creek Canal Enlargement	✓		✓					✓	
26	Inventory of Irrigation Infrastructure Improvement Needs - District 59	✓		✓		✓		✓	✓	
27	Inventory of Irrigation Infrastructure Improvement Needs - District 62	✓		✓		✓		✓	✓	
28	Environmental/Recreational Project Identification and Inventory - Lake Fork Region	✓				✓		✓		
29	City of Ouray Water Efficiency and Conservation Plan	✓			✓				✓	
30	Inventory of Irrigation Infrastructure Improvement Needs - District 68	✓		✓		✓		✓	✓	
31	Environmental/Recreational Project Identification and Inventory - Upper Uncompahgre Region	✓				✓		✓		
32	Environmental/Recreational Project Identification and Inventory - Upper Gunnison Region	✓				✓		✓		
33	NoChicoBrush	✓	✓	✓					✓	
34	Gunnison Basin Selenium Management Plan and Gunnison Basin Selenium Task Force	✓		✓			✓		✓	
35	Colorado River Storage Project - MOA Projects	✓		✓			✓		✓	
36	Development of Upper Uncompahgre Water Supplies	✓		✓	✓				✓	
37	Improvements to Red Mountain Ditch	✓		✓	✓				✓	
38	Gunnison Basin Roundtable 2015 Education Action Plan Activities	✓	✓					✓		✓

Table 8 provides brief narrative descriptions discussing general relationships between identified Basin Goals and proposed Tier 1 Basin Projects. Most Basin Goals are fulfilled by numerous Basin Projects.

Table 8. Relationships between Basin Goals and Proposed Basin Projects

Goal 1: Protect existing water uses in the Gunnison Basin – Thirty eight sponsored projects are expected to help fulfill this goal, many with the intent to maintain current irrigated acreage. The projects include community outreach and conservation planning to enable communities to reduce municipal and industrial water consumption; and strategic basin system improvements for improved crop yields, reduced operational inputs, improved water quality, and system reliability.

Goal 2: Discourage the conversion of productive agricultural land to all other uses within the context of private property rights – Eight projects are expected to help fulfill this goal with the intent to preserve current irrigated acreage. The projects include four miles of conveyance piping to overcome existing ditch leakage issues; enlargement of an existing reservoir; rehabilitation of an existing dam; improvements of existing delivery systems; improvement of Sage Grouse habitat; providing new augmentation water; and strategic basin system improvements for improved crop yields, reduced operational inputs, improved water quality, and system reliability.

Goal 3: Improve agricultural water supplies to reduce shortages – Thirty sponsored projects are expected to help fulfill this goal with the intent to reduce projected agricultural shortages. The projects include restoration, maintenance, or modernization of significant agricultural water supply infrastructure; enlargements of existing canals and reservoirs; improvement of existing canal delivery efficiency; removal of reservoir sediment; modification of reservoir outlet works; rehabilitation of an existing dam; development of water supplies for augmentation M&I, irrigation, hydropower, and instream flow enhancement; and strategic basin system improvements for improved crop yields, reduced operational inputs, improved water quality, and system reliability.

Goal 4: Identify and address municipal and industrial water shortages – Six sponsored projects are expected to help fulfill this goal with the intent to reliably meet projected municipal demands and continue effective water conservation programs. The projects include enlargement of an existing reservoir; upgrades to an outlet structure of an existing reservoir; siting of two new reservoirs; community outreach and conservation planning to enable communities to reduce municipal and industrial water consumption; and development of water supplies for augmentation, irrigation, hydropower, and instream flow enhancement.

Goal 5: Quantify and protect environmental and recreational water uses – Twelve sponsored projects are expected to help fulfill this goal with the intent to improve environmental and recreational focus areas in existing stream channels and to improve native trout populations. The projects include the investigation of feasibility for nonconsumptive focus segments in four specific regions of the Gunnison Basin.

Goal 6: Maintain or, where necessary, improve water quality throughout the Gunnison Basin – Two sponsored projects are expected to help fulfill this goal with the intent to maintain outstanding water quality in headwaters streams and improve site-specific water quality related to mining, selenium, and salinity issues. The projects include investigation of feasibility for nonconsumptive focus segments in four specific regions of the Gunnison Basin; and development of water supplies for augmentation, irrigation, hydropower, and instream flow enhancement.

Goal 7: Describe and encourage the beneficial relationship between agricultural and environmental and recreational water uses – Thirteen sponsored projects are expected to help fulfill this goal with the intent to complete new multi-purpose water projects in the Gunnison Basin that meet multiple needs. The projects include four miles of conveyance piping to overcome existing ditch leakage issues;

rehabilitation of an existing dam; improvements of existing delivery systems; improvement of Sage Grouse habitat; and providing new augmentation water.

Goal 8: Restore, maintain, and modernize critical water infrastructure, including hydropower –

Twenty eight sponsored projects are expected to help fulfill this goal with the intent to implement at least one project every year in the Gunnison Basin focusing on the restoration, maintenance, and modernization of existing water infrastructure. The projects include restoration, maintenance, or modernization of significant agricultural water supply infrastructure; enlargements of existing canals and reservoirs; improvement of existing canal delivery efficiency; removal of reservoir sediment; modification of reservoir outlet works; rehabilitation of an existing dam; development of water supplies for augmentation, irrigation, hydropower, and instream flow enhancement; and strategic basin system improvements for improved crop yields, reduced operational inputs, improved water quality, and system reliability; improvements to conveyance, automation, and measurement infrastructure for an existing reservoir; and reconstruction of a tunnel and ditch piping.

Goal 9: Create and maintain active, relevant and comprehensive public education, outreach and stewardship processes involving water resources in the six sectors of the Gunnison Basin –

One sponsored project is expected to help fulfill this goal with the intent to encourage participation in water education and leadership programs. The project includes community outreach and conservation planning to enable communities to reduce municipal and industrial water consumption.

Section 5: Basin Recommendations

Each project proposed for the Gunnison Basin requires a unique and systematic plan for implementation that includes discrete steps to maneuver the project from conception to completion. These implementation strategies typically involve two primary categories of action prior to completion of the project: *securing project acceptance* and *demonstrating project feasibility*. Each step in the project implementation process includes various challenges (constraints), or potential key issues or circumstances that may limit the ability of a project proponent to implement the proposed project. For each constraint, there exists a corresponding strategy to successfully complete the project. Table 9 summarizes strategies to overcome constraints related to securing project acceptance and demonstrating project feasibility to allow implementation of projects proposed for the Gunnison Basin. More detailed recommendations for each of these strategies is included in Section 5.

Table 9. Project Constraints and Implementation Strategies

Category	Constraint	Strategies
Project Acceptance	Conflict	Partnerships Cooperative Strategies
	Perception	Public Education and Outreach Incentive-Based Programs
	Regulations	Cooperative Strategies Regulatory Streamlining
Project Feasibility	Cost	Creative Funding Mechanisms Partnerships and Cooperative Strategies
	Water Availability	Water Availability Analyses Water Administration Strategies
	Constructability	Feasibility Analyses Engineering Design

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