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Chapter 6: Water Supply Management for the Future (previously Chapter 5)

6.5 Municipal, industrial, and agricultural infrastructure projects and methods

The policy of the state of Colorado is to identify and implement projects and methods to meet community and agricultural water needs throughout Colorado, and achieve the following statewide long-term goals:

- Use water efficiently to reduce overall future water needs
- Identify additional projects and processes to meet the water supply gap for communities while balancing the needs of agriculture, the environment, and recreation across the state
- Meet community water needs during periods of drought

The draft Basin Implementation Plan (BIP) process produced a compendium of projects and methods to meet Colorado's future municipal, industrial, and agricultural needs. In developing their respective lists of projects and methods, the Basin Roundtables relied upon previously developed Identified Projects and Processes (IPPs), conducted interviews with water providers, and solicited public input to update existing IPPs and bring to light additional projects and methods. For the purposes of Colorado's Water Plan, the term *projects and methods* includes IPPs and additional efforts featured in the BIPs to close the M&I gaps and reduce agricultural shortages.

The Basin Roundtables vetted these proposed projects and methods to develop a draft list for their respective BIPs. Some Roundtables vetted the preliminary list through the entire roundtable, while others reviewed projects and methods by subcommittees. In the end, the Draft BIPs were reviewed or adopted by each Roundtable. In addition, many of the Roundtables tiered or prioritized their projects and methods to assist with future implementation.

The ultimate goal of developing lists of projects and methods is to meet Colorado's future water needs. In addition, this work will help calculate the remaining M&I water supply and demand gaps; determine residual agricultural shortages; estimate the costs of implementing the proposed projects and methods; identify the potential for intra-basin and inter-basin collaboration on proposed projects and methods; and identify the interrelationship and the potential for collaboration between consumptive and non-consumptive projects and methods.

In sum, the BIPs propose over 400 projects and methods. Although some of the proposed projects and methods are designated primarily as single-purpose, many are multi-purpose. The multi-purpose projects could benefit agricultural, municipal and industrial interests. Alternatively, these

projects could benefit the environment or expand recreational opportunities while meeting municipal or agricultural needs. Those projects and methods that intentionally target consumptive and non-consumptive benefits are categorized as *Multi-purpose*.

While the BIPs feature projects and methods intended to either close the M&I gaps, reduce agricultural shortages, or both, to do so incurs financial expenditures. Many roundtables included implementation cost estimates, although some did not. Proposing a project or method is one component of implementation, while developing cost estimates and financing mechanisms are another. Many proposed projects and methods are very well developed and currently in the permitting stages; however some are conceptual in nature, with uncertain or no stated cost estimates. The validity of cost estimates varies greatly across proposed projects and methods and across BIPs. With that caveat, individual project and method implementation costs range from $50,000 to $211 million. It should also be noted that some proposed projects or methods are multi-year efforts, with a wide array of implementation strategies and approaches. Summing all projects and methods within the respective BIPs reveals the range in which cost estimates vary. Identified cost estimates to implement the proposed projects and methods range from $12 million to $589 million per BIP, with the total statewide preliminary sum in the neighborhood of $690 million. However, many BIPs have not yet determined costs for their projects and most have not done so on a consistent basis. Therefore, this number represents a minimum financial need.

Another consideration for the identified projects and methods in the BIPs is their estimated yield, which affects the calculated M&I gaps and agricultural shortages. The yield is subject to some variability and further refinement by Basin Roundtables and through potential project permitting and financing. However, the estimated yield of the proposed projects and methods ranges from 18 acre-feet per year of new supply to 90,000 acre-feet per year. Similarly, the range of yield reflects the level of participation of project sponsors and project beneficiaries. Some projects and methods have multiple sponsors, ranging in size from small localized water providers, to regional water providers, such as conservancy and conservation districts, or cities. Furthermore, some projects are sponsored by a single entity while the associated beneficiaries are many. In other cases, a proposed project or method is sponsored by a single entity and has only one beneficiary. Many combinations of project sponsors and project beneficiaries are proposed, reflecting the collaborative nature of the BIP process, and the anticipated results.

The remainder of this section takes a more in-depth examination of each BIP.

6.5.1. Water Supply Projects and Methods

The types of projects and methods which could potentially be implemented are as varied as the needs in each basin and statewide. While projects and methods generally fall into two generic categories (structural and non-structural), this overview of the draft BIPs warranted a more specific categorization. In these summaries, projects will be tallied by type and the use by which the project was identified in the BIP, even though many projects may have multiple benefits.

SWSI 2010 identified several categories of IPPs, which have been consolidated into the following:

- Agricultural Water Transfers (including ATMs)

- Reuse of existing fully consumable supplies
- Growth into existing supplies
- In-basin projects
- New transbasin projects[i]

The majority of the projects identified in the BIPs fall into the category of "In-Basin Projects". For the purposes of this summary, in-basin projects could align with the following descriptions:

- Collaborative Management
- Storage Improvements & Expansion
- New Storage
- Ditch & Diversion Improvements
- Monitoring, Assessment, and Planning Efforts
- Municipal Infrastructure
- Energy
- Aquifer Storage and Recovery
- Water Rights and Supply
- Multi-purpose

In this section, the "Primary Message" of each Basin Implementation Plan is examined, summarizing the manner by which each basin prioritized projects and how the projects or methods identified match up or are assimilated with Basin Goals and Measurable Outcomes. The "Process" each basin used to garner public input is summarized, demonstrating how project lists were generated through compilations of existing lists, or through unique public input processes. Finally, there is a brief summary of projects and methods presented, illustrating some emphases and highlights, as well as identified acre-feet of development and costs when available.

In the provided basin summaries, project costs and identified acre-feet associated are drawn from material provided in the BIPs. Every basin conducted outreach, assimilated projects, and evaluated projects in a manner unique to the respective basins. As BIPs are further refined and projects and methods move to implementation, project information, costs, and associated acre-feet will come into greater focus. Basins with less extensive project lists may further refine the available information or augment their lists before finalization of the draft.

New and Emerging Projects and Methods

As the state of Colorado and the basin roundtables move towards implementation of Basin Implementation Plans and Colorado's Water Plan, innovative and creative solutions will be necessary to meet future needs, given the opportunities for funding and the nature of limited water resources. Though no perfect solution exists, these three emerging trends add to the suite of options which the state and the basins may rely on upon, in preparing for the future.

Aquifer Storage and Recovery: Aquifer Recharge is the process of infiltrating water to an aquifer through ponds, basins, canals, or wells [1]. In an alluvial aquifer, recharge is accomplished by allowing water to seep into underlying aquifer. For confined aquifers, aquifer recharge utilizes wells to inject the water at pressures greater than what exists in the aquifer. Aquifer storage and recovery (ASR) utilizes aquifer recharge to achieve the storage of water in the aquifer during times of low demand and high surface-water supply and later recovered by pumping when demand exceeds surface supply [2].

Colorado's Denver Basin Bedrock aquifers have been utilized by several water providers for the storage of water over the past several decades. The Denver Basin aquifers are confined bedrock aquifers and they not considered tributary to the stream system. The water in these aquifers is appropriated under a separate legal framework based on overlying land ownership. Additionally, ASR projects utilizing these Denver Basin aquifers are governed by specific rules.

Although the majority of ASR projects utilize the Denver Basin aquifers, there are also two ongoing ASR projects in Colorado that involve utilization of alluvial aquifers. Artificial recharge to the alluvial aquifer is most commonly used for purpose of streamflow augmentation, rather than for storage and recovery. A majority of these alluvial recharge projects for augmentation occur in the South Platte basin [1], outside of the Designated Basins. Permanent artificial recharge projects, outside of the designated basins, must ultimately receive a decree through water court and operate within confines of Colorado's prior appropriation system.

Collaborative Management Solutions: These sort of projects and methods frequently cross basin boundaries, and consist of multiple parties working together to achieve often disparate goals. Several examples of these solutions are found in section 9.2, where entities representing many uses come together for creative water management. Examples include the Colorado River Cooperative Agreement (CRCA) and Arkansas River Voluntary Flow Agreement. In these solutions, a host of different needs can be met by creative collaboration and the involvement of many stakeholders throughout the entire agreement process.

Alternative Agricultural Transfer Methods: For much of Colorado's water history, the agricultural water user has been faced with two options: continue operations as normal, or sell water rights to an interested party, often a municipality seeking to firm up supply. Under potential alternatives to agricultural transfer, interested parties seek to provide a third option, within the boundaries of Colorado's prior appropriation system.

Though the viability of certain types of alternative transfers are still under review, this option should be a manner by which Colorado seeks to meet future needs, as opposed to the permanent "buy-and-dry" of agricultural lands. ATMs are discussed in more detail in section 6.4.

Arkansas Basin

Primary Message: The basin roundtable identified additional storage as a primary goal of the implementation plan. Roundtable members believe that traditional storage is the best avenue to meet the basin's supply needs, for both consumptive uses, as well as environmental and recreational. Additional methods to meet future needs include aquifer storage and recovery projects, as well as alternatives to agricultural transfer methods (ATMs). Moving forward, the roundtable plans to focus efforts on a disaggregation of the basin gaps, to identify more localized needs, at the county level. The roundtable will also take a closer look at identified projects and methods, to prioritize available funding and resources. In project implementation, the roundtable identified compact compliance issues as a key challenge, with a critical gap also represented by the replacement of nonrenewable groundwater, and sustainability of designated basins.[ii]

Arkansas Basin at a Glance

10 projects identified

$2,058,587 in total identified costs for **9** projects

36,400 total acre-feet identified for **2** projects

Process: The roundtable reviewed the SWSI 2010 IPP list, and held 17 public outreach meetings where over 100 Input Forms were submitted.[iii] These forms proposed projects, methods, and potential policy implementation. These input forms will be reviewed and ranked by the roundtable, with some proponents invited to attend roundtable meetings and present on the identified project, method, or suggestion. The current project list consists of projects and methods from the existing IPP list, or those funded via the WSRA Grant Program. Further vetting and ranking will take place during Phase 2 of BIP process.

Projects and Methods Summary: The roundtable identified a total of 10 projects and methods meeting municipal, industrial, or agricultural needs.[iv]

- 3 Storage Improvements & Expansion projects,
- 3 Ditch & Diversion Improvements,
- 3 Monitoring, Assessment, or Planning efforts, and
- 6 of these projects were classified as potentially multipurpose.

Three of the storage improvements & expansion projects provide for municipal and industrial use, with one providing for agricultural and nonconsumptive uses. Two of the three are reservoir rehabilitation projects. The projects primarily seek to improve or expand existing infrastructure, including reservoirs, canals, and ditches, rather than new storage.

Colorado Basin

Primary Message: A particular focus of the Colorado Basin Roundtable is the completion of a basin-wide stream management plan, with a more in-depth analysis and understanding of the amounts of water necessary to maintain environmental and recreational attributes. Regarding future projects and methods, the Basin Roundtable has stressed the uncertainty associated with the sufficiency of current water supplies, to meet in-basin consumptive as well as environmental and recreational needs. The basin emphasizes the need for more in-depth studies and work on the effects of climate change on water supplies, and the variability of wet and dry years. The roundtable expresses their point of view as follows: "the most prudent planning approach… is to assume that there is no more water to develop for export from the Colorado Basin."[v] The extensive public outreach undertaken by the basin, as described below, resulted in a comprehensive list of potential identified projects and methods, which make up a suite of options for the basin to meet their future needs.

Colorado Basin at a Glance

92 projects identified

$10,000,000 in total identified costs for **10** projects

513,005 - 543,003 total acre-feet of development identified for **54** projects

Process: The roundtable members divided into Project Leadership Teams (PLTs), which focused on particular subject matter areas within the BIP. The consumptive PLT worked to identify projects within the basin geared towards meeting future water supply needs. Water providers throughout the basin were interviewed, in person or through a standardized questionnaire. These information gathering efforts focused on existing and forecasted supply, as well as projects and methods to meet demands. Existing studies or reports were also analyzed for planned projects. Additional town hall meetings were held, and roundtable members and consultants traveled to a number of meetings, gathering information, such as county commissions and city councils.

Projects and Methods Summary: The roundtable identified a total of 88 projects and methods meeting municipal, industrial, or agricultural needs, with associated acre-feet or costs.[vi]

- 17 of these projects were Storage Improvements & Expansion
- 9 projects were identified as New Storage
- over 25 projects were identified as multipurpose, while many others could have multiple benefits

Future efforts of the basin will focus on prioritization of projects and methods, with potential modeling, to further understand potential constraints and opportunities within the river system.

Gunnison Basin

Primary Message: The primary goal of the Gunnison Basin is to "Protect existing uses in the Gunnison Basin."[vii] With that overarching goal in mind, other goals promote the continued importance of agriculture, the protection of environmental and recreational uses, and the maintenance of infrastructure within the basin. Agricultural shortages and methods to deal with this need are a primary focus, as projects and methods are identified and prioritized with this goal

in mind. Municipal and industrial needs, as quantified in the BIP, are expected to be met with currently existing supplies, and the implementation of currently planned projects and methods. Projects and potential constraints were modeled in the BIP, to evaluate the potential impacts to supply and water rights from project or method implementation. This modeling effort provided a cursory feasibility analysis for projects at a basin-wide scale, taking into account water availability, irrigation decrees, agricultural impacts on streamflows, and instream flows. Projects and methods identified in the basin were evaluated and put into tiers by the roundtable.

Gunnison Basin at a Glance

85 projects identified, **38** classified as **Tier 1**

$414,205,952 in total identified costs for **34** Tier 1 projects

125,071 total acre-feet of development identified for **18** Tier 1 projects

Process: The roundtable members and consultants conducted a series of targeted technical outreach meetings throughout the basin, working with water management agencies and stakeholders to identify projects and methods intended to meet future needs within the basin. A list of current projects was created, intended to represent the state of water planning at the time of BIP publication. Projects identified through the outreach process were compared to the Basin Goals, and evaluated by their timeline for completion. With these two criteria in mind, the BIP committee approved three "tiers" of identified projects and methods:

- **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.[viii]

Modeling analyses also informed the tiering process, identifying projects and methods with multipurpose uses, as well as the selection of agricultural projects which most effectively address shortages. As stated, the project list is intended to be a "snapshot" of current planning efforts, and future updates and additions to the BIP may affect the current prioritization or update information on projects and methods.[ix] Future studies may also affect the prioritization, as supplies, demands, or processes are updated and refined.

Projects which were classified as Tier 1 were analyzed in "Project Summary Sheets" created by the roundtable. These sheets provide a more in-depth look at the projects and methods, with information such as project yield, sponsor, and a detailed look at how the project may meet basin goals. Projects which were classified as Tiers 2 or 3 were briefly outlined in a table, as well as inventory projects, which will further examine regional projects and methods.

Projects and Methods Summary: The roundtable identified a total of 85 projects and methods meeting municipal, industrial, or agricultural needs. [x]

- 22 projects identified were Storage Improvements & Expansion
- 24 projects for Ditch & Diversion Improvements

- 11 Monitoring, Assessment, or Planning Efforts

A great number of the Gunnison roundtable's identified projects have an agricultural benefit, to be expected in this largely agricultural area. 6 projects were also identified proposing new storage.

North Platte Basin

Primary Message: The Basin Goals established by the North Platte Basin Roundtable are intended to maintain historical water uses within the basin, as well as provide a look forward at the future of development. Chief concerns in this particular basin are the Equitable Apportionment decree, and the depletion allowance of the Three State Agreement.[xi] Agricultural needs related to shortages are paramount, as well as infrastructural storage and water delivery concerns. A list of "potential basin solutions" was created, including both structural projects and methods for water management.

North Platte Basin at a Glance

27 projects identified, **14** analyzed in summary sheets

12,197 acres of new irrigation for **9** projects

12,000 total acre-feet of development identified for **6** projects

Process: Similar to the Gunnison Basin Roundtable, the North Platte process was driven by identification of projects, and comparing those projects to Basin Goals. Targeted technical outreach was conducted by the roundtable, reaching out to water managers and other stakeholders. Modeling analyses were performed within the basin, to identify challenges to implementation, as well as to examine the effects of specific projects. As projects were reviewed, potential multiple use projects were highlighted, and potential water availability constraints were called out. With the Basin Roundtable focus on agricultural needs, a shortage analysis was performed to identify projects and methods which most effectively addressed shortages.

The list of solutions was prioritized by conformity with the Basin Goals, as well as timeline for potential implementation. Some projects were selected to receive additional analysis in the form of a project summary sheet, for these reasons:

- The project, and associated analysis herein, is representative of other projects on the list, such as the case with the Proposed Willow Creek Reservoir and the Hanson and Wattenberg Ditch Acreage;
- Implementation of the project is currently being pursued, such as the case with the Protocols and MacFarlane Reservoir; or
- Implementation of the project is potentially more feasible than projects on the following list due to limited constraints or challenges or more support from the Basin Roundtable, as with the Canal Maintenance and Improvements project. [xii]

The project summary sheets provide a more extensive analysis of project or method information, such as "project constraints, implementation strategies and how well the project meets the Basin Goals."[xiii] 27 projects and methods were identified in the Draft BIP, with 14 receiving a project summary sheet analysis.

Projects and Methods Summary: The roundtable identified a total of 27 projects and methods meeting municipal, industrial, or agricultural needs. [xiv]

- 10 identified Ditch & Diversion Improvements
- 5 New Storage projects
- 5 Monitoring, Assessment, or Planning Efforts

The majority of the projects and methods identified serve an agricultural benefit. The most numerous projects are agricultural improvements, and many of the new storage projects will need further study to refine acre-feet projections.

Rio Grande Basin

Primary Message: The Rio Grande Basin Roundtable identified 14 different goals, with central tenets of "a resilient agricultural economy, watershed and ecosystem health, sustainable groundwater resources, the encouragement of projects with multiple benefits, and the preservation of recreational activities."[xv] Through public outreach and the work of roundtable subcommittees, projects were identified which met Basin Goals. Projects and methods which meet multiple benefits and uses were identified as desirable, and would stand a greater chance of receiving funding. In future planning efforts, the roundtable plans to develop project ranking criteria, and continue to identify projects and methods which meet Basin Goals.

Rio Grande Basin at a Glance

47 projects identified

$40,498,900 in total identified costs for **16** site-specific projects

59,500 total affected acres identified in Storage Improvements & Expansion projects

Process: Through the subcommittee and stakeholder outreach process, 18 projects were identified which the roundtable chose for a more in-depth analysis through project fact sheets.[xvi] These fact sheets provided more information about each project, such as sponsor, location, estimated project costs, and the comparison of the project outcomes with Basin Goals. A matrix was also generated which displayed each project, the needs met by the project, and which Basin Goals would be met through project implementation. 16 of these projects were site-specific, and cost estimates were provided through the year 2020.[xvii]

29 additional projects and methods were identified by the roundtable for future consideration and discussion. These projects were not analyzed at the fact sheet level because of time constraints and available information, but the roundtable believes that they could be beneficial to meeting basin needs and Goals. In the future, fact sheets will be completed, and cost estimates developed, as available. The basin intends for this plan to remain dynamic, with projects and methods added as additional needs, methodologies, and focus areas are identified.

Projects and Methods Summary: The roundtable identified a total of 47 projects and methods meeting municipal, industrial, or agricultural needs.[xviii]

- 9 Monitoring, Assessment or Planning Efforts
- 5 Storage Improvements & Expansion projects identified
- 4 Ditch & Diversion Improvements

The Rio Grande Basin Roundtable identified many projects related to Monitoring, Assessment, and Planning, in line with their Basin Goals related to Water Administration. The Basin Roundtable also puts a particular emphasis on multipurpose projects, with a majority being classified as such.

South Platte Basin (includes Metro)

Primary Message: The South Platte and Metro Basin Roundtables, worked together on a joint BIP, and sought for water supply solutions to be "pragmatic, balanced, and consistent with Colorado water law and property rights."[xix] Multipurpose projects are emphasized, with the following three objectives specifically identified. "Projects and methods should be configured to meet multi-purpose objectives that balance:

a) Consumptive with environmental and recreational needs;
b) Surface and groundwater utilization and storage; and
c) Current versus potential future needs and values."[xx]

South Platte / Metro Basins at a Glance:

42 projects identified

No cost estimates provided in the Draft BIP

252,315 total acre-feet of development identified in planned projects and methods

This BIP specifically referenced the "Four Legs of Stool", a result of IBCC work which identifies four key tactics for meeting future water supply.

The South Platte / Metro BIP identifies three categories of water development to meet future uses within the basin: 1) Water use efficiency improvements and water sharing strategies including conservation, reuse, ATMs and system integration; 2) Supply development involving new storage and conveyance systems and investigating, preserving, and developing Colorado River options; and 3) Watershed health and water quality management.[xxi] The BIP examines both larger scale concepts, such as transmountain diversions, and smaller scale projects and methods, such as storage and reuse projects. Project concepts identified in the joint BIP are primarily geared toward meeting municipal, industrial, and agricultural needs. These concepts are further divided into project categories such as reuse, agricultural transfers, aquifer storage and recovery, and transmountain diversions.

Process: Like some other basins, the South Platte / Metro joint effort began with the IPP list identified through the SWSI 2010 process. Potential project sponsors (water conservancy districts, municipalities, counties) were interviewed via project summary sheets, gathering basin project information such as sponsor and estimated cost. Project summary sheets which were gathered through the outreach process were reviewed by the Executive Committee of the Metro roundtable, and the South Platte's Rio Chato Committee. For inclusion in the BIP, projects or methods were then reviewed by both roundtables in full.

Projects and Methods Summary: The Basin Roundtables identified a total of 42 projects and methods meeting municipal, industrial, or agricultural needs.[xxii]

- 10 projects identified as Storage Improvements & Expansion
- 12 Reuse projects identified

- additional categories of projects such as Agricultural Transfers, ASR, and transmountain diversions

Future efforts of the basin will focus on identification of additional projects and refining of cost estimates.

Southwest Basin

Primary Message: The Southwest Basin takes the approach that all needs should be viewed equally, be they agricultural, municipal, industrial, environmental, or recreational. 21 goals and 30 measurable outcomes were adopted by the roundtable in their BIP, with water supply needs as the focus.[xxiii] Since SWSI 2010, the roundtable has identified the completion of 55 projects within the basin. Through the basin's outreach process, conducted in support of the BIP, 75 new projects were added to the list, totaling 130 IPPs. Of these identified projects and methods, "about 50% of the IPPs are for needs such as agricultural, municipal, and industrial"[xxiv] The BIP is intended to serve as a living guidance document for basin water supply planning, with projects, methods, and goals continuing to be refined as needs evolve.

Southwest Basin at a Glance:

97 projects identified

$60,000,000 in total identified costs for **1** site-specific project

245,687 total acre-feet of development identified

Process: Themes, goals, and measurable outcomes identified by the basin are geared towards identifying and meeting water supply gaps. Themes B and C directly address the matter: "B) Maintain Agriculture Water Needs, C) Meet Municipal and Industrial Water Needs."[xxv] With these overarching themes in mind, the roundtable conducted outreach across the basin, contacting water managers and other stakeholders to identify potential new projects and methods which had arisen since SWSI 2010. Public workshops were also conducted by roundtable members and consultants, to inform the public about the BIP and Colorado's Water Plan process, and to elicit information about potential projects or methods. The listing of projects in the BIP began with the SWSI 2010 identified projects, and then roundtable members and consultants contacted potential project proponents, gathering project and methods information in the form of a questionnaire. Project questionnaires were vetted by the roundtable, and projects or methods were adopted by inclusion in the BIP.

Projects and Methods Summary: The roundtable identified a total of 97 projects and methods meeting municipal, industrial, or agricultural needs. [xxvi]

- 19 projects were identified as Ditch and Diversion Improvements
- 13 projects involved Collaborative Management
- 10 Monitoring, Assessment, and Planning Efforts

The Southwest Basin Roundtable will continue to evaluate projects and methods, and refinement of project information will provide more detail on cost estimates and new acre-feet. The new acre-feet total above does not include an amount of new storage and expansion projects included in the BIP.

Yampa/White/Green Basin

Primary Message: In the Yampa/White/Green Basin Implementation Plan, the roundtable focused on two main concepts, regarding implementation of projects and methods for municipal, industrial, and agricultural uses. First, the roundtable seeks to provide sufficient supply of "local water resources for existing uses and future development."[xxvii] Also identified was the need for implementation of projects and methods which are "appropriately located, sized, and operated…to protect important water uses and the environment."[xxviii] The Basin Roundtables also discusses the importance of the Colorado River Compact, and the need to keep compact concerns in mind when planning for the implementation of projects and methods. With these overarching themes in mind, the Basin Roundtables adopted eight primary basin goals, with meeting existing and anticipated future uses within the basin as the chief concern.

Yampa/White/Green Basin at a Glance:

21 projects identified

No cost estimates provided in the Draft BIP

252,315 total acre-feet of development identified in projects and methods

A list of Projects and Processes was developed by the roundtable, in consultation with basin water managers and other stakeholders. The list is intended to remain dynamic; to be updated as basin needs, the understanding of river operations, and potential project proponents may be updated and refined. The Projects and Processes identified stem from information provided through basin studies, such as SWSI 2020, and the 2014 Project and Method Study funded by the roundtable. 21 projects were identified by the roundtable as meeting basin goals, and appropriate for implementation. The majority of the projects identified are new storage projects, with municipal, industrial, and agricultural needs being met by implementation.

Process: The roundtable undertook a public outreach process throughout the basin, to engage stakeholders and gather input on the BIP, as well as Colorado's Water Plan. Projects and Processes identified through SWSI 2010 were updated, and the most up-to-date project information was identified in the 2014 Project and Method Study (P&M Study)[xxix]. With the basin goals in mind, the Basin Roundtable gathered information from project proponents and stakeholders. Surveys distributed throughout the basin at public information meetings or through individual contact by members of the BIP Committee were intended to identify projects which were not included in SWSI or the P&M Study.

Projects and Methods Summary: The Draft BIPI identified a total of 21 projects and methods meeting municipal, industrial, or agricultural needs.[xxx]

- 9 projects identifying New Storage
- 2 Ditch and Diversion Improvement
- 2 Storage Improvements & Expansion

Ongoing studies in the basin will inform additional acre-feet yield, and project costs can be fleshed out by project proponents during the permitting and financing stages.

6.5.3. Maintenance of Existing Projects and Methods

New projects and methods will be critical for meeting Colorado's water supply needs. However, existing infrastructure and currently operational projects and methods require maintenance and upkeep, which are just as important as bringing new methods online. In evaluating funding mechanisms for future projects, many proponents will include operations and maintenance costs within the proposed budget. For many federal projects, maintenance costs are included in repayment contracts, or are associated with power revenues. For many municipal projects, maintenance costs are passed on to the ratepayer. Funding mechanisms through entities such as the CWCB, as discussed in section 9.1, are available for the costs associated with maintenance, repair, and improvements.

Every Draft BIP includes goals to modernize water infrastructure or improve agricultural efficiencies. Through the BIP process, many basins also identified operations, maintenance, and improvements as part of their plan for future needs. For example, the North Platte Basin had ten projects which identified ditch and diversion improvements as their primary benefit. In these agriculturally focused basins, improvements to conveyance systems will be of high importance when planning for future needs. The Gunnison Basin Roundtable identified 22 projects classified as storage improvements and expansion: either maintaining existing reservoirs or planning for more storage. The Colorado Basin similarly listed many projects associated with storage expansion, and also plans for improving or updating existing municipal infrastructure. In this manner, the basins are preparing for new projects and methods, while maintaining the existing supply systems.

6.5.4 Next Steps

In order to support projects and methods that meet future municipal, industrial, and agricultural needs, several next steps are necessary.

1. Continue to support and assist the Basin Roundtables in moving forward the municipal, industrial, and agricultural projects and methods identified in their BIPs.
2. Incorporate the potential effect of climate change on municipal, industrial, and agricultural projects and methods.
3. Support an integrated approach to understanding how environmental and recreational projects and methods may interact with municipal, agricultural, and industrial projects and methods.
4. Continue to track municipal, industrial, and agricultural projects and methods.
5. Continue to support and implement state programs that contribute to implementing municipal, industrial, and agricultural projects and methods. These include loan and grant programs, as well as ongoing studies such as the Statewide Water Supply Initiative.
6. As discussed in Section 9.1, strengthen funding opportunities for municipal, industrial, and agricultural projects and methods by:
    a. Coordinating current funding
    b. Assessing funding needs
    c. Exploring additional funding opportunities
7. As discussed in 2.4, refine the permitting process to make it more effective and efficient.

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[xxiii] Harris Water Engineering, *Draft Southwest Basin Implementation Plan,* Durango, CO, 2014.
[xxiv] *Id.*
[xxv] *Id.*
[xxvi] *Id.*
[xxvii] AMEC, *Draft Yampa/White/Green Basin Implementation Plan,* Denver, CO, 2014.
[xxviii] *Id.*
[xxix] *Id.*
[xxx] *Id.*

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