STATEWIDE WATER SUPPLY INITIATIVE
BACKGROUND

Following the drought of 2002, the Colorado legislature authorized the CWCB to move forward with an in-depth technical study of Colorado's future water supplies and demands. The first Statewide Water Supply Initiative (SWSI) was approved by the Board in 2004, providing a look at current and future water needs, as well as a survey of potential approaches to meet those needs. The SWSI evolution continued with SWSI 2, which created four technical "roundtables" to explore needs identified in SWSI, as well as select potential solutions in more depth.

During this timeframe, the "Water for the 21st Century Act" created nine basin roundtables in each major drainage basin within the state, providing a forum for discussion on water issues. The Act also created the Interbasin Compact Committee (IBCC), consisting of representatives from the basin roundtables and other interest groups. This group would facilitate conversations on issues that reach across basins and on issues with statewide implications.

The basin roundtables were charged with developing a closer understanding of needs at the basin level, developing needs assessments, and proposing projects and methods by which to meet the enumerated needs. These needs assessments and the ongoing progress at the IBCC level would be the basis of SWSI 2010, informing the water supply planning at the state level with necessary grassroots input at the basin level.

The SWSI 2010 update included these updated local assessments, as well as an analysis of environmental and recreational needs, as informed by the basin roundtables. Other innovations included water availability analyses, more refinement of projects and methods, and baseline costs for implementation measures.

With Executive Order D 2013-005, Governor Hickenlooper directed the CWCB to commence work on Colorado's Water Plan. This effort would be the first of its kind, laying out the grassroots work of the basins through the Basin Implementation Plan process and the methods by which the State can assist basins in meeting their water needs. SWSI 2010 served as the technical foundation for the Basin Implementation Plan process and for Colorado's Water Plan.

The next SWSI update will serve as the technical basis for water supply planning at the State level moving forward. Updates to SWSI will include incorporation of the IBCC's work on scenario planning, climate change, development of an agricultural gap methodology, and analysis and incorporation of Basin Implementation Plans. The SWSI update will be prepared with an eye forward to future iterations and updates to Basin Implementation Plans and Colorado's Water Plan.

SWSI SCOPE OF WORK (Previously released for RFP purposes)

The objective of this Scope of Work is to provide technical support to the state's ongoing water planning activities by:

1. Completing SWSI 2016 and associated technical memos.
2. Completing additional technical, economic, and financial work related to Colorado's Water Plan.
3. Project integration with consultants working on Basin Implementation Plans.
4. Meeting facilitation as the agency deems necessary.

Wherever possible, State-supported and developed data sets, tools and models (e.g., data sets, irrigated acreage mapping and analytical tools developed under CDSS and in Basin Implementation Plans) should be utilized in completing SWSI 2016 and any additional technical work.

Proposers may bid on one or more of the following components:[1]

1. **Project Manager:** Advise the agency regarding all aspects of the project, provide project management support functions, perform quality control reviews, and integrate the technical work from other elements of this project into well-written and properly-formatted deliverables. Tasks include:
    a. Delivery of a polished, accurate, well-written, technically-edited and formatted SWSI 2016 update and provide resources as needed to publish the final Colorado Water Plan, such as copying, editing, photography, design, public relations and other functions.
    b. Responsible for compiling consultant information and work products into sections for SWSI.
    c. Integration with consultants working on Basin Implementation Plans, as needed.
    d. Delivery of other products on an as-needed basis as established by task order.
    e. Coordination of the stakeholder involvement and revision process, which will include the basin roundtables, technical experts, and other stakeholders.
    f. Meeting facilitation services, as the agency deems necessary.

2. **Water Data Specialist:** Update, quantify, prioritize, analyze, and integrate all relevant municipal, industrial, agricultural, environmental, recreation, and energy needs, projects, and supply-demand gaps. This work should build upon draft information in Colorado's Water Plan, the Basin Implementation Plans, the nonconsumptive toolbox, SWSI 2010, scenario planning, needs assessments, and other available resources. This work will also include an important focus on water conservation strategies, water quantity/quality issues, and land use patterns. This work will also incorporate information on climate change using available climate modeling and data plus information on adaptation and state action plans.
    a. **Environment & Recreation:** Update, quantify, prioritize, analyze, and integrate environmental & recreational needs, projects, and gaps. This work should build upon the Basin Implementation Plans, the nonconsumptive toolbox, SWSI 2010, scenario planning, nonconsumptive needs assessments, and other resources. Identify watersheds critical to water supply, the environment, and recreation.

[1] The agency will further clarify each task order developed under the contract(s), including methodology, technical memorandums, etc.

Summarize these needs by updating the focus area mapping, instream flows, endangered species, and wild and scenic river programs. It will incorporate additional work by basin roundtables, such as the goals and measurable outcomes developed as part of the Basin Implementation Plans, and any work done by the basin roundtables using the Watershed Flow Evaluation Tool. Lastly, it will describe how climate variability may impact these needs.

1. Update environmental and recreational needs on an attribute and geographical basis, building upon past efforts.
2. Assess needs in relation to the scenarios, including at least qualitative assessments for the impacts of climate change.

ii. As a component of the Adaptive Strategies framework a statewide plan will be laid out with "sign posts" noting important future decision points based on factors such as changes in water demand, supply, and attitudes. These strategies may be necessary in the long term. Conceptualize additional projects and methods that may be needed to meet Colorado's long-term environmental and recreational goals.

iii. As part of The CWP Basin Implementation Plan & Project Proponent Summaries, answer the question "What specific projects and methods are planned to meet Colorado's consumptive and environmental and recreation needs?" This will describe each basin's goals and measurable outcomes. It will then summarize the projects and methods the Basin Roundtables have identified in their Basin Implementation Plans to meet their future needs. It will contextualize these projects and methods within the no and low regrets and adaptive strategies framework. Finally, it will include summaries of each Basin Implementation Plan, noting their major issues and implementation strategies.

1. Update the Nonconsumptive database with all Basin Implementation Plan identified projects and methods. This may include significant outreach to project proponents so that there is consistent data across basins, including location information.
2. Update the projects and methods lists for meeting Colorado's environmental and recreation needs by incorporating additional projects and methods found in the Basin Implementation Plans and submitted by other project proponents.
3. Gather any available cost estimates from the Basin Implementation Plans and project proponents and package for the water finance specialist.
4. Update and improve design of the nonconsumptive projects and methods database.

iv. Describe the difference between what the basin indicates it wants to achieve with regard to meeting their environmental and recreation needs, as defined in their goals and measurable outcomes, and what projects and methods they have determined could be implemented to meet those needs. Gaps may vary by scenario and the success of the Basin Implementation Plan identified projects and methods.

Determine the environmental and recreation gaps for each basin by IBCC scenario, taking into account climate change impacts for certain scenarios.

1. Identify where more site-specific quantification of environmental and recreational needs would be helpful.
2. Ongoing technical work further quantifying environmental and recreational needs, projects and methods, gap analyses, and impacts from climate change. This may include further assessment and identification of Colorado's goals and measurable outcomes for federally and state listed endangered and threatened species, imperiled species, and economically important recreational areas.
3. Identify watersheds critical to water supply, environmental, and recreational health. Add adaptive strategy to No and Low Regret Actions

b. **Municipal & Self Supplied Industrial Needs and Demand Management:** Quantify a range of municipal and industrial needs by scenario, taking into account demand management (e.g., conservation, land use patterns) and climate change. This work will build upon the three population scenarios, House Bill 10-1051 data, Basin Implementation Plans, Conservation Levels Analysis, Municipal and Industrial Water conservation Strategies, and other past work.

   i. Summarize and update the consumptive needs from SWSI 2010 with new information on how these demands may vary based on climate variability. This will include data from HB 1051, updated passive savings, updated industrial uses (recent oil and gas development, mining, etc.), and updated data on agricultural water use. Data will be compiled in the Basin Needs Decision Support System (BNDSS) for archiving and gap analysis. In addition, this incorporates the municipal, industrial, and agricultural goals and measurable outcomes, as defined in the Basin Implementation Plans.
      1. Update information on current state of water conservation in Colorado including demand data from the H.B. 10-1051data collection effort, and the availability and ability for using or sharing conserved water.
      2. Investigate demand reduction potential for passive and active conservation, for the relationship between water use and land use patterns, and urban landscape and irrigation management practices.
      3. Update and quantify by scenario levels of self supplied industrial use by sector.
      4. Analysis of five water use and conservation scenarios by defining conservation and key demand drivers, forecasting future demand under each scenario, and evaluating the range of impacts in each scenario, including updating demand increases due to climate change, as found in Chapter 5 of Colorado's Water Plan.
   ii. As a component of Adaptive Strategies, assist in providing technical support concerning the No and Low Regret Actions and adaptive strategies.

iii. As a component of Basin Implementation Plan and Project Proponent Summaries, assist in summarizing Basin Implementation Plan and water provider conservation work.

iv. As a component of Municipal and Industrial Gap Analysis, describe the amount of future M&I needs not met by the adaptive strategies and Basin Implementation Plans. Gaps will vary both by scenario and by how much the no and low regrets / Basin Implementation Plans are implemented. This section will include water use data and water supply data to assess the gap between water supply and water demands for municipal water providers. Data collected through the implementation of HB 1051 guidelines and the Basin Implementation Plans will inform this gap analysis.

1. Assist in the conservation component of the gap analysis.
2. Assist in the demand side increases due to climate change component of the gap analysis.

c. Modeling, Gap, and Water Supply: Assess agricultural needs, projects and methods, water supplies, and the municipal, industrial, and agricultural gaps by scenario, taking into account climate change and the No and Low Regrets actions.

i. *Agricultural Needs:* Quantify a range of agricultural needs by scenario, taking into account demand management, climate change, agricultural sharing, and agricultural loss due to a variety of factors using existing data and work from the Basin Implementation Plans.

1. As a component of Statewide Consumptive and environmental and recreation needs:
    a. By basin, evaluate demand reduction potentials based upon scenarios, including updating agricultural increases and losses due to urbanization, agricultural transfers, groundwater sustainability, and conservation practices.
    b. By basin, update demand increases due to climate change and increased irrigated acreage.
    c. Assess net needs, using the scenarios as well as the goals and measurable outcomes identified in the Basin Implementation Plans.
    d. Analysis of five consumptive and diversion water use scenarios, including updating demand increases due to climate change, as found in Chapter 5 of Colorado's Water Plan.
2. As a component of Agricultural Gap Analysis, determine the demand side increases due to climate change.

ii. *Projects & Methods:* Consumptive and multi-purpose project and methods analysis and compilation.

1. Update the Basin Needs Decision Support System database with all Basin Implementation Plan identified projects and methods. This may include significant outreach to project proponents so

that there is consistent data across basins, including location information.

2. As a component of Adaptive Strategies,
    a. Refine adaptive strategies based on Basin Implementation Plans and other technical work.
3. As a component of Basin Implementation Plan and Project Proponent Summaries, Assess and organize the municipal, industrial, and agricultural projects and methods and update how well these address the no and low regrets and adaptive strategies.
4. Work with project proponents, and Basin Roundtables to ensure that the projects and methods have sufficient detail to be modeled.
5. Assessment of quantitative information related to lessons learned from alternative agricultural transfer methods (ATMs) and an assessment of how ATMs can reduce permanent agricultural dry-up, and how this work should be monitored.
6. Assessment of reuse potential based on what is in the Basin Implementation Plans, the amount water providers plan to reuse, and opportunity for regional reuse project(s).
7. Assessment of additional storage
    a. Incorporate ongoing Division of Water Resources technical work identifying additional storage opportunities in existing structures, building off the existing Division of Water Resources assessment.
    b. Update the dam site inventory dataset and GIS layers
8. Gather available cost information from Basin Implementation Plan and other sources and package for Water Finance Specialist.

iii. *Water Supplies:* Surface supplies will be analyzed under dry, average, and wet hydrology (including historical, climate adjusted, and paleo hydrology for each basin). In addition, an analysis of storage will be done for each basin by evaluating the basin's firm yield using a simplified modeling approach. Inputs from the adaptive management framework and modeling efforts done via the CRWAS phase II and/or the Basin Implementation Plan process will be included as appropriate.

1. Review and update existing work quantifying surface water supply availability by basin for each of the scenarios.
2. Update groundwater supply availability by basin for each scenario.

iii. Gap Analysis

1. Model projects and methods for each basin by quantified scenario.
2. Analyze and determine the structural and shortage gap analyses by scenario for Municipal and Industrial Gap Analysis
3. Analyze and determine the structural and shortage gap analyses by scenario for Agricultural Gap Analysis

3. **Water Finance Specialist:** Review and further refine financial need projections from Colorado's Water Plan, committee work, and other sources. Verify and update cost estimates for statewide water needs, and describe a financial strategy and economic implications for implementing the water plan. Discuss opportunities are available to help fund implementation of CWP.
    a. **Cost estimates for Colorado's water needs**
        i. Building upon the provided cost information from the Basin Implementation Plans, provide reconnaissance level detail to the no and low regrets and the adaptive strategies by scenario. These should be compared to the status quo.
        ii. Building upon the provided cost information from the Basin Implementation Plans, provide a reconnaissance level cost estimate the municipal, industrial, and agricultural projects and methods, including for conservation and reuse.
        iii. Building upon the provided cost information from the Basin Implementation Plans; provide a reconnaissance level cost estimate for environmental and recreational projects and methods.
    b. **Financial strategy**
        i. Describe the economic effect of implementing Colorado's Water Plan versus the status quo.
        ii. Determine the amount of financial support that may be needed from state sources.
        iii. Describe and assess opportunities to fund Colorado's Water Plan.
4. **Water Economy Specialist:** Review, update, and refine population projections for the planning period (through 2050) based on best available data, and in close coordination with the State Demographer's Office. Develop a detailed explanation of water markets in Colorado and the West, and provide relevant water pricing information for various sectors of use across the diverse geographic and climatic areas in Colorado. Develop a compendium of information regarding public surveys, use trends, and value of water as perceived by customers and stakeholders.
    a. As a component of Statewide Social Values, explain the concept of social values and how they fit into a scenario planning approach. Use CWCB's Value of Water survey information to establish the baseline of Colorado's current social values. Quantify baseline, "green," and full resource use social values by scenario based off past survey work done in Colorado and the West.
    b. As a component of Statewide Consumptive and environmental and recreation needs update population estimates in relation to the identified scenarios out to 2050.