Water Supply Reserve Account – Grant and Loan Program
Water Activity Summary Sheet
May 18-19, 2016
Agenda Item 18(d)

Applicant:	Yampa/White/Green Basin Roundtable
Fiscal Agent:	Colorado River Water Conservation District
Water Activity Name:	Yampa/White/Green Basin Implementation Plan Modeling
Water Activity Purpose:	Study: Nonconsumptive & Consumptive
County:	Routt, Garfield, Rio Blanco, Moffat
Drainage Basin:	Yampa/White/Green
Water Source:	Yampa/White and tributaries
Amount Requested/Source of Funds:	$150,000 Yampa/White/Green Basin Account (total grant request)
Matching Funds:	none required, none provided

Staff Recommendation:
Staff recommends approval of up to $150,000 from the Yampa/White/Green Basin Account to help fund the project titled: Yampa/White/Green Basin Implementation Plan Modeling.

Water Activity Summary: The Yampa/White/Green Basin Implementation Plan Modeling project provides the next steps to advance the Yampa/White/Green Basin Implementation Plan (BIP}. The project builds on previous BIP modeling efforts to help the basin roundtable (BRT) understand the potential benefits and impacts of identified projects and processes (IPPs), and ultimately, which IPPs may merit moving to the next stage of implementation. In addition, the project seeks to illuminate how operations in the basin would be affected by water rights administration. During the development of the model, the contractor will work closely with the full BRT, the modeling Subcommittee, and project proponents to deliver a fully documented, adaptable model that captures the vision and needs defined by the BRT. The effort is designed to solicit input from diverse stakeholders and build consensus on the most effective ways to meet identified needs in the basin.

Objectives:

- Maintain close communication between the contractor, the BRT Subcommittee, full BRT membership, and project proponents;
- Clearly define and document modeling assumptions;
- Foster understanding and consensus regarding the baseline model to ensure everyone is on the same page;
- Provide modeling workshops to set up, run, and examine results "on the fly";
- Execute modeling simulations that examine the IPPs individually and in combination, and;
- Document final model results in concise technical memos, a final report, and a presentation to the BRT.

Discussion: The proposed project aligns well with many of the Goals and Measurable Outcomes in the Yampa/White/Green Basin Implementation Plan, while simultaneously furthering the goals of Colorado's Water Plan.

Issues/Additional Needs: No issues or additional needs have been identified.

Threshold and Evaluation Criteria: The application meets all four Threshold Criteria.

Tier 1-3 Evaluation Criteria: n/a

Funding Summary/Matching Funds: none required, none provided

CWCB Project Manager: Craig Godbout

All products, data and information developed as a result of this grant must be provided to the CWCB in hard copy and electronic format as part of the project documentation. This information will in turn be made widely available to Basin Roundtables and the general public and will help promote the development of a common technical platform. In accordance with the revised WSRA Criteria and Guidelines, staff would like to highlight additional reporting and final deliverable requirements. The specific requirements are provided below.

Reporting: The applicant shall provide the CWCB a progress report every 6 months, beginning from the date of the executed contract. The progress report shall describe the completion or partial completion of the tasks identified in the scope of work including a description of any major issues that have occurred and any corrective action taken to address these issues.

Final Deliverable: At completion of the project, the applicant shall provide the CWCB a final report that summarizes the project and documents how the project was completed. This report may contain photographs, summaries of meetings and engineering reports/designs.

Engineering: All engineering work (as defined in the Engineers Practice Act (§12-25-102(10) C.R.S.)) performed under this grant shall be performed by or under the responsible charge of professional engineer licensed by the State of Colorado to practice Engineering.

March 31, 2016

Mr. Craig Godbout
Colorado Water Conservation Board

(via email: craig.godbout@state.co.us)

Dear Craig:

On July 8, 2015, the Yampa/White/Green Basin Roundtable approved a Water Supply Reserve Account grant in the amount of $150,000, using basin funds, to take next steps to further our Basin Implementation Plan. Additionally, the BRT wishes to use remaining BIP grant funds which total approximately $50, 000 for Next Steps as well. The total work effort will therefore total $200,000.

The Colorado River District will be acting as fiscal agent for this work.

Transmitted herewith, on behalf of the BRT, is the WSRA grant application, including scope of work, budget and schedule for the proposed work, which we understand will be on the CWCB May agenda for approval.

If you need any additional information or have any questions, please do not hesitate to get in touch.

Sincerely,

Mary Brown

Mary Brown, Chair
Yampa/White/Green Basin Roundtable

Attachment

COLORADO
DEPARTMENT OF NATURAL RESOURCES

COLORADO WATER CONSERVATION BOARD

WATER SUPPLY RESERVE ACCOUNT APPLICATION FORM

Today's Date: April 1, 2016

Yampa/White/Green Basin Implementation Plan Modeling

Name of Water Activity/Project

Yampa/White/Green Basin Roundtable
(Fiscal Agent: Colorado River Water Conservation District)

Name of Applicant

Yampa/White/Green

Amount from Statewide Account: N/A

Amount from Basin Account(s): $150,000

Total WSRA Funds Requested: $150,000

Approving Basin Roundtable(s)
(If multiple basins specify amounts in parentheses.)

FEIN: 84-6000156 (fiscal agent)

Application Content

Required Exhibits

A. Statement of Work, Budget, and Schedule
B. Project Map
C. As Needed (i.e. letters of support, photos, maps, etc.)

Appendices – Reference Material

1. Program Information
2. Insurance Requirements
3. WSRA Standard Contract Information (Required for Projects Over $100,000)
4. W-9 Form (Required for All Projects Prior to Contracting)

Instructions

To receive funding from the Water Supply Reserve Account (WSRA), a proposed water activity must be approved by the local Basin Roundtable **AND** the Colorado Water Conservation Board (CWCB). The process for Basin Roundtable consideration and approval is outlined in materials in Appendix 1.

Once approved by the local Basin Roundtable, the applicant should submit this application **with a detailed statement of work including budget and schedule as Exhibit A** to CWCB staff by the application deadline.

WSRA applications are due with the roundtable letter of support 60 calendar days prior to the bi-monthly Board meeting at which it will be considered. Board meetings are held in January, March, May, July, September, and November. Meeting details, including scheduled dates, agendas, etc. are posted on the CWCB website at: http://cwcb.state.co.us Applications to the WSRA Basin Account are considered at every board meeting, while applications to the WSRA Statewide Account are only considered at the March and September board meetings.

When completing this application, the applicant should refer to the WSRA Criteria and Guidelines available at: http://cwcb.state.co.us/LoansGrants/water-supply-reserve-account-grants/Documents/WSRACriteriaGuidelines.pdf. In addition, the applicant should also refer to the Supplemental Scoring Matrix applied to Evaluation Criteria Tiers 1-3 for Statewide Account requests .

The application, statement of work, budget, and schedule **must be submitted in electronic format** (Microsoft Word or text-enabled PDF are preferred) and can be emailed or mailed on a disk to:

Craig Godbout - WSRA Application
Colorado Water Conservation Board
1313 Sherman St., Room 721
Denver, CO 80203
Craig.godbout@state.co.us

If you have questions or need additional assistance, please contact Craig Godbout at: 303-866-3441 x3210 or craig.godbout@state.co.us.

Water Supply Reserve Account – Application Form
Revised October 2013

Part I. - Description of the Applicant (Project Sponsor or Owner);

1.	Applicant Name(s):	Yampa/White/Green Basin Roundtable (Fiscal Agent: Colorado River Water Conservation District)		
	Mailing address:	POB 1120 Glenwood Springs, CO 81602		
	FEIN #:	84-6000156		
	Primary Contact:	Daniel R. Birch	Position/Title:	Deputy General Manager
	Email:	dbirch@crwcd.org		
	Phone Numbers:	Cell: 970-846-4128	Office:	970-945-8522 x239
	Alternate Contact:	Alesha Frederick	Position/Title:	Business Support Specialist
	Email:	afrederick@crwcd.org		
	Phone Numbers:	Cell: 662-574-6024	Office:	970-945-8522

2. Eligible entities for WSRA funds include the following. What type of entity is the Applicant?

[ ] Public (Government) – municipalities, enterprises, counties, and State of Colorado agencies. Federal agencies are encouraged to work with local entities and the local entity should be the grant recipient. Federal agencies are eligible, but only if they can make a compelling case for why a local partner cannot be the grant recipient.

[X] Public (Districts) – authorities, Title 32/special districts, (conservancy, conservation, and irrigation districts), and water activity enterprises.

[ ] Private Incorporated – mutual ditch companies, homeowners associations, corporations.

[ ] Private individuals, partnerships, and sole proprietors are eligible for funding from the Basin Accounts but not for funding from the Statewide Account.

[ ] Non-governmental organizations – broadly defined as any organization that is not part of the government.

3. Provide a brief description of your organization

The Yampa/White/Green Basin Roundtable (YWG Roundtable) is one of nine basin roundtables created by the Colorado Water for the 21st Century Act (H.B. 05-1177) to facilitate discussions on water management issues and encourage locally driven collaborative solutions. The YWG Roundtable covers roughly 10,500 square miles in northwest Colorado, including the largest cities of Steamboat Springs (pop. 10,402) and Craig (pop. 9,185). The YWG Roundtable successfully completed its Basin Implementation Plan (BIP) in 2015 as part of the Colorado Water Plan process, and now seeks to develop more refined modeling tools in the basin to more thoroughly assess identified projects and processes (IPPs) included in the BIP.

4. If the Contracting Entity is different then the Applicant (Project Sponsor or Owner) please describe the Contracting Entity here.

The Colorado River Water Conservation District (also known as the Colorado River District or the River District) was created by the Colorado General Assembly in 1937 to lead in the protection, conservation, use and development of the water resources of the Colorado River Basin for the welfare of the District, and to safeguard for Colorado all waters of the Colorado River to which the state is entitled. Fifteen counties in western Colorado comprise the District and each appoints a member to the Board of Directors. The District covers all the lands and waters of Grand, Summit, Eagle, Pitkin, Routt, Garfield, Moffat, Rio Blanco, Mesa, Delta, Gunnison and Ouray counties and parts of Montrose, Saguache and Hillsdale counties.

5. Successful applicants will have to execute a contract with the CWCB prior to beginning work on the portion of the project funded by the WSRA grant. In order to expedite the contracting process the CWCB has established a standard contract with provisions the applicant must adhere to. A link to this standard contract is included in Appendix 3. Please review this contract and check the appropriate box.

[X] The Applicant will be able to contract with the CWCB using the Standard Contract

[ ] The Applicant has reviewed the standard contract and has some questions/issues/concerns. Please be aware that any deviation from the standard contract could result in a significant delay between grant approval and the funds being available.

6. The Tax Payer Bill of Rights (TABOR) may limit the amount of grant money an entity can receive. Please describe any relevant TABOR issues that may affect the applicant.

The Colorado River Water Conservation District does not anticipate any TABOR issues.

Part II. - Description of the Water Activity/Project

1. What is the primary purpose of this grant application? (Please check only one)

[ ]	Nonconsumptive (Environmental or Recreational)
[ ]	Agricultural
[ ]	Municipal/Industrial
[ ]	Needs Assessment
[ ]	Education
[X]	Other Explain: This effort seeks to address all uses, per diverse IPPs

2. If you feel this project addresses multiple purposes please explain.

   As a broad modeling effort, this project will address all uses by helping to evaluate the impacts and benefits of various projects across all sectors, combined with an analysis of different hydrologic scenarios.

3. Is this project primarily a study or implementation of a water activity/project? (Please check only one)

[X] Study [ ] Implementation

4. To catalog measurable results achieved with WSRA funds can you provide any of the following numbers?

[ ]	New Storage Created (acre-feet)
[ ]	New Annual Water Supplies Developed, Consumptive or Nonconsumptive (acre-feet)
[ ]	Existing Storage Preserved or Enhanced (acre-feet)
[ ]	Length of Stream Restored or Protected (linear feet)
[ ]	Length of Pipe/Canal Built or Improved (linear feet)
[ ]	Efficiency Savings (acre-feet/year OR dollars/year – **circle one**)
[ ]	Area of Restored or Preserved Habitat (acres)
[X]	Other -- Explain: Will assist with IPP evaluation, and ultimately implementation

4. To help us map WSRA projects please include a map (Exhibit B) and provide the general coordinates below:

Latitude: N/A Longitude: N/A

5. Please provide an overview/summary of the proposed water activity (no more than one page). Include a description of the overall water activity and specifically what the WSRA funding will be used for. A full **Statement of Work** with a detailed budget and schedule is required as **Exhibit A** of this application.

The Yampa/White/Green Basin Implementation Plan Modeling project (project) provides the next steps to advance the Yampa/White/Green Basin Implementation Plan (BIP). The project builds on previous BIP modeling efforts to help the basin roundtable (BRT) understand the potential benefits and impacts of identified projects and processes (IPPs). In addition, the project seeks to illuminate how operations in the basin would be affected by water rights administration. During the development of the model, the contractor will work closely with the full BRT, the modeling Subcommittee, and project proponents to deliver a fully documented, adaptable model that captures the vision and needs defined by the BRT. The modeling effort is also intended to help build consensus among various stakeholders.

The contractor, Wilson Water Group (WWG), was selected through a competitive request for qualifications (RFQ) process based on their extensive modeling experience. WWG will provide the necessary modeling expertise, while using close communication with BRT members to provide the basin expertise, resulting in a useful model with meaningful results. While specific IPPs will be modeled per direction from the BRT, the modeling work is not intended to be prescriptive or otherwise provide specific project recommendations. Instead, it is intended to serve as a useful tool to examine the viability of various projects and how they may potentially complement and/or compete with one another. As such, this effort is designed to assist the BRT with determining which IPPs may merit moving to the next stage of implementation.

Objectives

-Maintain close communication between the contractor, the BRT Subcommittee, full BRT membership, and project proponents,
-Clearly define and document modeling assumptions,
-Foster understanding and consensus regarding the baseline model to ensure everyone is on the same page,
-Provide modeling workshops to set up, run, and examine results "on the fly",
-Execute modeling simulations that examine the IPPs individually and in combination, and
-Document final model results in concise technical memos, a final report, and a presentation to the BRT.

Part III. – Threshold and Evaluation Criteria

1. Describe how the water activity meets these **Threshold Criteria.** (Detailed in Part 3 of the Water Supply Reserve Account Criteria and Guidelines.)

   a) The water activity is consistent with Section 37-75-102 Colorado Revised Statutes.[1]

This activity is consistent with Section 37-75-102 Colorado Revised Statutes. By using and refining the Colorado Decision Support System modeling tools for the basin, this project supports a thorough analysis that is specifically designed to incorporate the existing water rights adjudication system.

   b) The water activity underwent an evaluation and approval process and was approved by the Basin Roundtable (BRT) and the application includes a description of the results of the BRTs evaluation and approval of the activity. At a minimum, the description must include the level of agreement reached by the roundtable, including any minority opinion(s) if there was not general agreement for the activity. The description must also include reasons why general agreement was not reached (if it was not), including who opposed the activity and why they opposed it. Note- If this information is included in the letter from the roundtable chair simply reference that letter.

This water activity was approved by the full YWG Roundtable on July 8th, 2015, as noted in the attached letter from the roundtable chair, Mary Brown (dated March 31st, 2016).

[1] 37-75-102. Water rights - protections. (1) It is the policy of the General Assembly that the current system of allocating water within Colorado shall not be superseded, abrogated, or otherwise impaired by this article. Nothing in this article shall be interpreted to repeal or in any manner amend the existing water rights adjudication system. The General Assembly affirms the state constitution's recognition of water rights as a private usufructuary property right, and this article is not intended to restrict the ability of the holder of a water right to use or to dispose of that water right in any manner permitted under Colorado law. (2) The General Assembly affirms the protections for contractual and property rights recognized by the contract and takings protections under the state constitution and related statutes. This article shall not be implemented in any way that would diminish, impair, or cause injury to any property or contractual right created by intergovernmental agreements, contracts, stipulations among parties to water cases, terms and conditions in water decrees, or any other similar document related to the allocation or use of water. This article shall not be construed to supersede, abrogate, or cause injury to vested water rights or decreed conditional water rights. The General Assembly affirms that this article does not impair, limit, or otherwise affect the rights of persons or entities to enter into agreements, contracts, or memoranda of understanding with other persons or entities relating to the appropriation, movement, or use of water under other provisions of law.

c) The water activity meets the provisions of Section 37-75-104(2), Colorado Revised Statutes.[2] The Basin Roundtable Chairs shall include in their approval letters for particular WSRA grant applications a description of how the water activity will assist in meeting the water supply needs identified in the basin roundtable's consumptive and/or non-consumptive needs assessments.

As noted in the attached letter from the roundtable chair, Mary Brown (dated March 31, 2016), this project will directly advance the next steps to further the YWG Basin Implementation Plan. As a broad and detailed modeling effort, this project will build on previous BIP modeling to help the basin roundtable understand the potential benefits and impacts of identified projects and processes (IPPs), and ultimately, which IPPs may merit moving to the next stage of implementation. The effort is designed to solicit input from diverse stakeholders and build consensus on the most effective ways to meet identified needs in the basin.

d) Matching Requirement: For requests from the **Statewide Fund**, the applicants will be required to demonstrate a **25 percent** (or greater) match of the total grant request from the other sources, including by not limited to Basin Funds. A minimum match of 5% of the total grant amount shall be from Basin funds. A minimum match of 5% of the total grant amount must come from the applicant or 3rd party sources. Sources of matching funds include but are not limited to Basin Funds, in-kind services, funding from other sources, and/or direct cash match. Past expenditures directly related to the project may be considered as matching funds if the expenditures occurred within 9 months of the date the contract or purchase order between the applicant and the State of Colorado is executed. Please describe the source(s) of matching funds. (NOTE: These matching funds should also be reflected in your Detailed Budget in **Exhibit A** of this application)

N/A - This application does not seek Statewide WSRA funds. However, In addition to the WSRA funds considered in this application, the YWG BRT and the Colorado River Water Conservation District (fiscal agent) has authorized an additional $51,000 (approximately) for the project from remaining YWG BIP funds to address any issues that may arise (such as the potential need to create a daily model).

[2] 37-75-104 (2)(c). Using data and information from the Statewide Water Supply Initiative and other appropriate sources and in cooperation with the on-going Statewide Water Supply Initiative, develop a basin-wide consumptive and nonconsumptive water supply needs assessment, conduct an analysis of available unappropriated waters within the basin, and propose projects or methods, both structural and nonstructural, for meeting those needs and utilizing those unappropriated waters where appropriate. Basin Roundtables shall actively seek the input and advice of affected local governments, water providers, and other interested stakeholders and persons in establishing its needs assessment, and shall propose projects or methods for meeting those needs. Recommendations from this assessment shall be forwarded to the Interbasin Compact Committee and other basin roundtables for analysis and consideration after the General Assembly has approved the Interbasin Compact Charter.

2. For Applications that include a request for funds from the **Statewide Account**, describe how the water activity/project meets all applicable **Evaluation Criteria.** (Detailed in Part 3 of the Water Supply Reserve Account Criteria and Guidelines and repeated below.) Projects will be assessed on how well they meet the Evaluation Criteria. **Please attach additional pages as necessary.**

Evaluation Criteria – the following criteria will be utilized to further evaluate the merits of the water activity proposed for funding from the Statewide Account. In evaluation of proposed water activities, preference will be given to projects that meet one or more criteria from each of the three "tiers" or categories. Each "tier" is grouped in level of importance. For instance, projects that meet Tier 1 criteria will outweigh projects that only meet Tier 3 criteria. The applicant should also refer to the Supplemental Scoring Matrix applied to Evaluation Criteria Tiers 1-3 for Statewide Account requests. WSRA grant requests for projects that may qualify for loans through the CWCB loan program will receive preference in the Statewide Evaluation Criteria if the grant request is part of a CWCB loan/WSRA grant package. For these CWCB loan/WSRA grant packages, the applicant must have a CWCB loan/WSRA grant ratio of 1:1 or higher. Preference will be given to those with a higher loan/grant ratio.

Tier 1: Promoting Collaboration/Cooperation and Meeting Water Management Goals and Identified Water Needs

a. The water activity addresses multiple needs or issues, including consumptive and/or non-consumptive needs, or the needs and issues of multiple interests or multiple basins. This can be demonstrated by obtaining letters of support from other basin roundtables (in addition to an approval letter from the sponsoring basin).
b. The number and types of entities represented in the application and the degree to which the activity will promote cooperation and collaboration among traditional consumptive water interests and/or non-consumptive interests, and if applicable, the degree to which the water activity is effective in addressing intrabasin or interbasin needs or issues.
c. The water activity helps implement projects and processes identified as helping meet Colorado's future water needs, and/or addresses the gap areas between available water supply and future need as identified in SWSI or a roundtable's basin-wide water needs assessment.

Tier 2: Facilitating Water Activity Implementation

d. Funding from this Account will reduce the uncertainty that the water activity will be implemented. For this criterion the applicant should discuss how receiving funding from the Account will make a significant difference in the implementation of the water activity (i.e., how will receiving funding enable the water activity to move forward or the inability obtaining funding elsewhere).
e. The amount of matching funds provided by the applicant via direct contributions, demonstrable in-kind contributions, and/or other sources demonstrates a significant & appropriate commitment to the project.

Tier 3: The Water Activity Addresses Other Issues of Statewide Value and Maximizes Benefits

f. The water activity helps sustain agriculture & open space, or meets environmental or recreational needs.
g. The water activity assists in the administration of compact-entitled waters or addresses problems related to compact entitled waters and compact compliance and the degree to which the activity promotes maximum utilization of state waters.
h. The water activity assists in the recovery of threatened and endangered wildlife species or Colorado State species of concern.

i. The water activity provides a high level of benefit to Colorado in relationship to the amount of funds requested.
j. The water activity is complimentary to or assists in the implementation of other CWCB programs.

Continued: Explanation of how the water activity/project meets all applicable **Evaluation Criteria**.

Please attach additional pages as necessary.

N/A - This application does not seek Statewide WSRA funds.

Part IV. – Required Supporting Material

1. **Water Rights, Availability, and Sustainability** – This information is needed to assess the viability of the water project or activity. Please provide a description of the water supply source to be utilized, or the water body to be affected by, the water activity. This should include a description of applicable water rights, and water rights issues, and the name/location of water bodies affected by the water activity.

As a broad modeling effort throughout the basin that employs the State's Colorado Decision Support System, by design this project will incorporate all adjudicated water rights (individually or in aggregate). As such, the project will help to assess water availability and the viability of numerous IPPs within current and future water rights administration scenarios.

2. Please provide a brief narrative of any related studies or permitting issues.

This project directly builds on all the previous needs assessment efforts in the YWG basin, specifically the most recent modeling and documentation compiled in the YWG Basin Implementation Plan. As a modeling effort, the project does not entail any permitting issues.

3. Statement of Work, Detailed Budget, and Project Schedule

The statement of work will form the basis for the contract between the Applicant and the State of Colorado. In short, the Applicant is agreeing to undertake the work for the compensation outlined in the statement of work and budget, and in return, the State of Colorado is receiving the deliverables/products specified. **Please note that costs incurred prior to execution of a contract or purchase order are not subject to reimbursement.** All WSRA funds are disbursed on a reimbursement basis after review invoices and appropriate backup material.

Please provide a detailed statement of work using the template in Exhibit A. Additional sections or modifications may be included as necessary. Please define all acronyms and include page numbers.

REPORTING AND FINAL DELIVERABLE

Reporting: The applicant shall provide the CWCB a progress report every 6 months, beginning from the date of the executed contract. The progress report shall describe the completion or partial completion of the tasks identified in the statement of work including a description of any major issues that have occurred and any corrective action taken to address these issues.

Final Deliverable: At completion of the project, the applicant shall provide the CWCB a final report that summarizes the project and documents how the project was completed. This report may contain photographs, summaries of meetings and engineering reports/designs.

PAYMENT

Payment will be made based on actual expenditures and invoicing by the applicant. Invoices from any other entity (i.e. subcontractors) cannot be processed by the State. The request for payment must include a description of the work accomplished by major task, and estimate of the percent completion for individual tasks and the entire water activity in relation to the percentage of budget spent, identification of any major issues and proposed or implemented corrective actions. The last 10 percent of the entire water activity budget will be withheld until final project/water activity documentation is completed. All products, data and information developed as a result of this grant must be provided to the CWCB in hard copy and electronic format as part of the project documentation. This information will in turn be made widely available to Basin Roundtables and the general public and help promote the development of a common technical platform.

The above statements are true to the best of my knowledge:

Signature of Applicant: 

Print Applicant's Name: Daniel R. Birch

Project Title: Yampa/White/Green Basin Implementation Plan Modeling

Date: April 1st, 2016

Return an electronic version (hardcopy may also be submitted) of this application to:

Craig Godbout – WSRA Application
Colorado Water Conservation Board
1313 Sherman St., Room 721
Denver, CO 80203
303-866-3441, ext. 3210 (office)
303-547-8061 (cell)
craig.godbout@state.co.us

Water Activity Name – Yampa/White/Green Basin Implementation Plan Modeling

Grant Recipient: Yampa/White/Green Basin Roundtable
(Fiscal Agent: Colorado River Water Conservation District)

Funding Source: Yampa/White/Green Basin Roundtable Basin Account - $150,000, with an additional $51,173 from the River District (fiscal agent) in previously authorized YWG BIP finds.

Introduction and Background

The Yampa/White/Green Basin Implementation Plan Modeling project (project) provides the next steps to advance the Yampa/White/Green Basin Implementation Plan (BIP). The project builds on previous BIP modeling efforts to help the basin roundtable (BRT) understand the potential benefits and impacts of identified projects and processes (IPPs). In addition, the project seeks to illuminate how operations in the basin would be affected by water rights administration. During the development of the model, the contractor will work closely with the full BRT, the modeling Subcommittee, and project proponents to deliver a fully documented, adaptable model that captures the vision and needs defined by the BRT. The modeling effort is also intended to help build consensus among various stakeholders.

The contractor, Wilson Water Group (WWG), was selected through a competitive request for qualifications (RFQ) process based on their extensive modeling experience. WWG will provide the necessary modeling expertise, while using close communication with BRT members to provide the basin expertise, resulting in a useful model with meaningful results. While specific IPPs will be modeled per direction from the BRT, the modeling work is not intended to be prescriptive or otherwise provide specific project recommendations. Instead, it is intended to serve as a useful tool to examine the viability of various projects and how they may potentially complement and/or compete with one another. As such, this effort is designed to assist the BRT with determining which IPPs may merit moving to the next stage of implementation.

Objectives

- Maintain close communication between the contractor, the BRT Subcommittee, full BRT membership, and project proponents,
- Clearly define and document modeling assumptions,
- Foster understanding and consensus regarding the baseline model to ensure everyone is on the same page,
- Provide modeling workshops to set up, run, and examine results “on the fly”,
- Execute modeling simulations that examine the IPPs individually and in combination, and
- Document final model results in concise technical memos, a final report, and a presentation to the BRT.

Task 1: Model Development

The Model Development task includes the following three subtasks:

- Task 1A - Initial Modeling Understanding
- Task 1B - Future Condition Scoping
- Task 1C - Output Design

Task 1A - Initial Model Understanding: The important goal of this task is for both WWG and the BRT to come to the same understanding about how the baseline model represents current uses, operations, and administration in the Yampa and White river basins. It is critical that the BRT feels comfortable that the model accurately represents current uses and operations. Without that confidence, none of the subsequent modeling results will be credible.

- WWG will rely on the State's official CDSS model as the basis for the baseline model because it is well documented, accepted, and reviewed. WWG recently completed the model extension and update. As part of the update, WWG discussed reservoir and municipal operations with the project operators. If necessary, WWG will confirm with the project operators that the model is correctly capturing their current operations and will work with the BRT to make sure that a sufficient level of detail is incorporated in the model. WWG will incorporate any changes into the State's official CDSS model and documentation. This will assure that future modeling efforts begin with a model that the basin water users have reviewed and accepted.
- For the Yampa and White StateMod update, WWG reviewed the model changes made for the Projects and Methods Study and the Basin Implementation Plan. WWG addressed and clarified discrepancies. For this project, WWG will review the changes made with the BRT to provide a common level of understanding and comfort.

Task 1B - Future Condition Scoping: The goal of this task is for WWG to work closely with the BRT to understand and enhance, if necessary, the SWSI demand projections and the IPPs that will be evaluated. WWG is on the team selected by CWCB to update the SWSI demand projections and perform water availability analyses; therefore WWG will be able to clearly articulate both the procedure used and the results for the updated demands. The following are the specific issues that need to be determined prior to beginning future demand modeling efforts:

- Hydrology – What are the appropriate natural flows to use as the input to the modeling efforts? Historical flow (1908 through 2013), paleohydrology (1000 through 2002), and CMIP3 climate projected hydrology (representing projections for 2040 and 2070) are currently available for use in the Yampa and White models. Although these inflow hydrology data sets are available, our past experience indicates the use of "too many" hydrologic variations may not be desirable. WWG will work with the BRT to determine the appropriate inflow hydrology that will be used for all model scenarios.

- Future Demands – Is the BRT comfortable with the SWSI demands? WWG will work with the BRT to determine how future demands should be represented in StateMod – specifically where demands projected on a county-level should be represented in the modeling effort. WWG will clearly document the results of this discussion so the BRT can understand which nodes in the model represent current demands and which nodes represent future demands. WWG will document how the future demands can be met, either through direct diversion rights and the priority of those rights, or releases from reservoirs and the operational assumptions that are made to provide storage water.
- IPPs – WWG and the Subcommittee will review the BIP report and determine which IPPs can and should be included in StateMod. For example, the BRT identified "Restore, maintain, and modernize water storage and distribution infrastructure" as a Basin Goal. While improvements to existing headgates are not captured by StateMod, the flow-based impacts to a systematic canal lining program could be reflected in the model. For each IPP that will be modeled, WWG will meet with the project proponents identified by the BRT.

WWG will develop a "fact sheet" summarizing the project after meeting with the project proponents. For example, a reservoir fact sheet will include the following:

- Reservoir location and whether it is located on or off-channel and, if off-channel, the pipeline or ditch location and capacity for filling will be included
- Reservoir right for filling (conditional or new junior right)
- Account sizes and uses if the reservoir is multi-use; note that the reservoir size will be for initial use, as the model will be used to determine the most appropriate reservoir size to meet the required uses
- Demands on the reservoir and operations; which existing consumptive or non-consumptive demands can receive water and which future consumptive and non-consumptive demands may be met by the reservoir

If a project proponent is not identified for an infrastructure IPP, WWG will develop the fact sheet based on previous reports and modeling efforts and input from the Subcommittee.

Task 1C - Output Design: The BRT and WWG will work together to identify meaningful, useful output. The goal is to present simple and consistent information for all of the scenarios, including individual project simulations and combined project simulations. The results will focus on critical periods in the hydrologic record, frequency of key metrics, and seasonal variations. Because consistent information will be presented, WWG may find joint uses for a previously envisioned single use project and will examine how projects interact.

- Results will primarily be presented as comparisons with the baseline condition model and the future demand model, and highlight the changes to the river system in response to IPPs.
- Results will include changes in consumptive and non-consumptive use shortages. In addition, results will include spatial distribution of shortages and changes through time, both in terms of critical periods, year types, and seasonal variations. Non-consumptive use

shortages will consider how frequently and with what severity instream flow water rights and targets are not met. The flow targets from the Colorado River Endangered Fish Recovery Program, the Yampa River Programmatic Biological Opinion, and the Biological Opinion for the Taylor Draw Project in the White basin will be considered.

- WWG will start with the non-consumptive use metrics identified in the 2012 Yampa-White BRT Watershed Flow Evaluation Tool Study and used in the Projects and Methods and Basin Implementation Plan reports. WWG will confirm with the BRT that this is a complete list of metrics and add more if necessary.
- Results will be presented spatially, graphically, and in tables since individuals' process information in different ways.
- WWG will summarize the results by providing observations in bullet format explaining what the maps, graphs, and tables show.
- The performance of existing reservoirs will be measured in changes to end of month storage, ability to meet existing demands, and yield in specific year types.
- The results from implementing each IPP and IPPs in combination will be documented in separate technical memos using a common format.
- WWG will start with a monthly model to understand the issues and represent the level of detail currently available for some of the IPPs. If there are areas where flows on a daily time step are critical to evaluating the project performance, WWG will explore the use of a disaggregation approach before implementing a full daily time step. If a daily model is determined by the BRT to be necessary, WWG will develop a cost estimate clearly outlining the level of effort required.

To accomplish Task 1, Wilson Water Group will coordinate a workshop with the BRT Subcommittee and a series of meetings with the IPP project proponents. During the B*aseline Model and Future Demand Scenario Scope Workshop*, Wilson Water Group will review how they updated the State's official CDSS model and determine if additional conversations are needed with operators of current projects. The details of the Future Demand Scenario will be finalized. WWG will review the BIP and determine with IPPs can and should be represented in the model. Finally, Wilson Water Group will present examples of output graphs, tables and maps as discussed in Task 1C.

The BRT will then prepare a list of project proponents for each of the IPPs, enabling WWG to efficiently meet with the list of contacts. WWG envisions spending up to five consecutive days in the Yampa and White basins meeting individually with project operators and proponents as needed. WWG will create the Fact Sheets described in Task 1B from the project proponent meetings.

Task 2: Future Conditions Model Runs

The Future Conditions Model Runs task includes the following three subtasks:

- 2A – Model runs based on meeting consumptive use with no IPPs
- 2B – Model runs with IPPs incorporated to meet consumptive uses
- 2C – Adjusted model runs to meet a balance of consumptive, environmental, and recreational flows

Task 2A - Model runs based on meeting consumptive use with no IPPs: This "future demand" modeling scenario builds on the baseline dataset by including future demands, as determined by the BRT in Task 1B, with junior water rights. Depending on the location and seasonal distribution of future demands, a portion of the demands may be met with available flow in the river. This task will determine remaining shortages that could be met from IPPs. The following approach is will be used:

- StateMod will be simulated with the BRT approved SWSI consumptive demand amount and locations with a current-day junior water right. WWG will evaluate how well the demands can be met under the current river conditions.
- WWG will present the output as determined in Task 1C, so the BRT can understand the impacts of the SWSI demands on existing streamflow conditions.

Task 2B - Model runs with IPPs incorporated to meet consumptive uses: This is a series of modeling scenarios that build on the future demand scenario developed for Task 2A. Since the likelihood of every IPP being developed in the future is relatively low, and because many of the IPPs would use the same available water supply, this task will determine the benefits of individual IPPs, as well as their benefits in combination. The following approach is will be used:

- The IPPs model location, capacity, water rights, and operations will be based on the fact-sheets developed through discussions with the project proponents and reviewed by the BRT as described in Task 1B.
- WWG will incorporate the selected IPPs into the StateMod input files using the data-centered approach used for the CDSS that "self-documents" changes to the baseline data input file so modelers in the future can clearly understand modeling approach.
- Projects will be simulated (turned on) individually and then in combination.
- WWG will present the output as determined in Task 1C so the BRT can understand the impacts of both the SWSI demands and the IPPs on existing streamflow conditions.

After Task 2A and 2B have been started by Wilson Water Group, initial comparison results will be presented to the Subcommittee. This will be an iterative process to ensure that the Subcommittee is comfortable with the assumptions and results of Task 2A and 2B, before the start of Task 2C.

Task 2C - Adjusted model runs to meet a balance of consumptive, environmental, and recreational flows: This is a series of modeling scenarios that adjust IPPs plus current project operations to optimize both consumptive and non-consumptive needs. WWG will use a more interactive modeling approach

than the previous tasks, including a combination of prepared model simulations based on likely solutions, plus model simulations identified during "on the fly" modeling workshops with a technical subcommittee. WWG will modify the IPP operations and re-run the model in real time based on input and ideas from the Subcommittee. Results for key metrics identified in Task 1C will be automated so the impacts of the changes can be quickly reviewed and understood. The number of workshops will depend on the number of IPPs that the Subcommittee decides to investigate.

Task 3: Final Report

WWG will compile individual technical memos to describe the modeling approach and assumptions for each IPP simulation in Task 1B, based on meetings with project proponents, as well as the results presented per Task 1C. Since it is important to preserve these individual project technical summaries, they will be included as appendices in the final report. As noted in the RFQ, the report is not intended to be prescriptive, but will provide results in comprehensive matrices that can be used as a roadmap for future efforts.

- The primary documentation will be the State's official CDSS model documentation. WWG will focus on detailing changes and assumptions represented in the scenarios that were generated.
- Results will compare the key metrics identified in Task 1C between the baseline model, future demand scenario, and each scenario of individual and combined IPPs.
- Results will be presented in each of the final report sections based on the output presentation developed and approved with BRT in Task 1C.

The following provides a preliminary outline of the final report, referencing the project task where the supporting analyses occur. The final report outline will be determined jointly with the BRT.

- **BRT Modeling Approach** (brief overview of CDSS model, inflow hydrology, future demands and demand locations, IPPs investigated and interaction with proponents) ***Tasks 1A and 1B***
- **Baseline Model Results** (provides the output designed in Task 1C summarizing the shortages to current consumptive and non-consumptive needs based on current conditions) ***Understanding from Task 1A***
- **Future Demand Scenario Results Compared to Baseline Results** (provides the output designed in Task 1C to analyze future demand impacts to the river system without IPPs) ***Task 2A***
- **Results with Individual and Combined IPPs Compared to Future Demand Scenario Results** (provides the output designed in Task 1C to analyze impacts to the river system of individual and combined IPPs) ***Task 2B***
- **Combined Scenario including Potential Changes to Current Operations Results** (scenarios to optimize meeting future consumptive and non-consumptive needs including potential changes to existing basin project operations) ***Task 2C***
- **Appendix A (**Individual IPP documentation that include modeling "fact sheets", approach, and results) ***Task 1B and 2B***

Wilson Water Group will present final results to the full BRT at a regularly scheduled BRT meeting. If requested, WWG will attend additional BRT meetings throughout the project duration to provide project status, summary of results to date, and summary of future efforts. In addition, WWG will provide monthly reports of progress and budget status with each invoice.

Project Schedule and Budget

The project will be completed by December 2017, depending on the availability of the BRT, Subcommittee, and project proponents. In addition to the WSRA funds considered in this application, the YWG BRT and the Colorado River Water Conservation District (fiscal agent) has authorized an additional $51,173 for the project from remaining YWG BIP funds. The table below is the tentative schedule and budget.

Task	Cost ($)	Anticipated Completion
Task 1: Model Development		
1A - Initial Model Understanding*	27,579	July 2016
1B - Future Condition Scoping*	23,594	September 2016
1C - Output Design	27,776	December 2016
Task 2: Future Conditions Model Runs		
2A - Model runs based on meeting consumptive use with no IPPs	18,520	February 2016
2B - Model runs with IPPs incorporated to meet consumptive uses	31,636	May 2017
2C - Adjusted model runs to meet a balance of consumptive, environmental, and recreational flows	37,016	September 2017
Task 3: Final Report		
3A -Final Report	29,736	November 2017
3B - Final Presentation	5,316	December 2017
Total	**$201,173**	

* Subtasks 1A and 1B will be funded by the $51,173 remaining YWG BIP funds.