STATE OF COLORADO

Colorado Water Conservation Board
Department of Natural Resources
1580 Logan Street, Suite 600
Denver, Colorado 80203
Phone: (303) 866-3441
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www.cwcb.state.co.us

September 5, 2012

Ms. Mary Halstead
Department of Natural Resources
1313 Sherman Street, Room 818
Denver CO 80203

RE: Alluvial Aquifer Accretion/Depletion Analysis Tool (AAADAT)

Dear Mary:

This letter is to inform you that the contract for the WSRA grant request to assist in the Alluvial Aquifer Accretion/Depletion Analysis Tool (AAADAT) project in the South Platte Basin was signed on August 30, 2012.

With the executed contract, you are now able to proceed with the project and begin invoicing the State of Colorado for costs incurred through May 31, 2014. Upon receipt of your invoice(s), the State of Colorado will provide payment no later than 45 days. I wish you much success in your project.

Sincerely,

/s/

Todd Doherty
Colorado Water Conservation Board
Water Supply Planning Section
1580 Logan Street, Suite 200
Denver, CO 80203
Phone: 303-866-3441 x3210
Mobile: 720-214-3262
Todd.doherty@state.co.us
www.cwcb.state.co.us and www.ibcc.state.co.us

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STATE OF COLORADO
Colorado Water Conservation Board
INTERAGENCY AGREEMENT
with
Colorado Divison of Water Resources
C154209

TABLE OF CONTENTS

1. PARTIES

This Interagency Agreement (hereinafter called "Agreement") is entered into by and between the Colorado Water Conservation Board (hereinafter called "CWCB"), and the Colorado Division of Water Resources (hereinafter called "DWR"), who may collectively be called the "Parties" and individually a "Party", both of which are agencies of the STATE OF COLORADO, hereinafter called the "State".

2. EFFECTIVE DATE AND NOTICE OF NONLIABILITY.

This Agreement shall not be effective or enforceable until it is approved and signed by the Colorado State Controller or designee (hereinafter called the "Effective Date"), but shall be effective and enforceable thereafter in accordance with its provisions.

3. RECITALS

A. Authority, Appropriation, And Approval

Authority to enter into this Agreement exists pursuant to State Fiscal Rule 3-3 and funds have been budgeted, appropriated and otherwise made available pursuant to Colorado Revised Statutes (CRS) 39-29-109(2)(c), 37-75-104(2)(c) and 37-75-102 et al., and Senate Bill 06-179 adopted by the 2006 General Assembly and a sufficient unencumbered balance thereof remains available for payment. Required approvals, clearance and coordination have been accomplished from and with appropriate agencies.

B. Consideration

The Parties acknowledge that the mutual promises and covenants contained herein and other good and valuable consideration are sufficient and adequate to support this Agreement.

C. Purpose

The Water Supply Reserve Account provides money for grants and loans to complete water activities, which are broadly defined and include water supply and environmental projects and/or studies. This Grant is for the Alluvial Aquifer Accretion/Depletion Analysis Tool (AAADAT) in the South Platte River Basin and the Metro River Basin.

D. Term-Work Commencement

The Parties respective performances under this Agreement shall commence on the later of the Effective Date or September 1, 2012. This Agreement shall terminate on May 31, 2014 unless sooner terminated or further extended as specified elsewhere herein. Either Party may terminate this Agreement by giving the other Party 30 days prior written notice setting forth the date of termination. Upon termination the liabilities of the Parties for future performance hereunder shall cease, but the Parties shall perform their respective obligations up to the date of termination.

E. Two Month Extension

CWCB, at its sole discretion upon written notice to DWR as provided in **§10,** may unilaterally extend the term of this Agreement for a period not to exceed two months if the Parties are negotiating a replacement agreement (and not merely seeking a term extension) at or near the end of any initial term or any extension thereof. The provisions of this Agreement in effect when such notice is given, including, but not limited to prices, rates, and delivery requirements, shall remain in effect during the two-month extension. The two month extension shall immediately terminate when and if a replacement agreement is approved and signed by the State Controller.

4. STATEMENT OF WORK

A. Work

DWR shall complete the Work and its other obligations as described herein and in **Exhibit A** on or before May 31, 2014. CWCB shall not be liable to compensate DWR for any Work performed prior to the Effective Date or after the termination of this Agreement.

B. Goods and Services

DWR shall produce goods and services necessary to complete its obligations. Such procurement shall be accomplished using Agreement Funds and shall not increase the maximum amount payable hereunder by CWCB.

5. PAYMENTS-MAXIUM AMOUNT

The maximum amount payable under this Agreement to DWR by CWCB is $200,000 as determined by CWCB from available funds. Payments to DWR are limited to the unpaid obligated balance of this Agreement set forth in **Exhibit A**. CWCB shall make payment for purchases of goods and services within 30 days after receipt of valid invoices from DWR. Payments shall be made by an interagency transfer in lieu of a State warrant whenever possible. The maximum amount payable by Payor to Payee during each State fiscal year of this Agreement shall be:

$200,000 in FY2013
$200,000 in FY2014, minus any funds expended in FY2013

6. RECORDS-MAINTENANCE AND INSPECTION

A. Maintenance

During the term of this Agreement and for a period terminating upon the later of **(i)** the five year anniversary of the final payment under this Agreement or **(ii)** the resolution of any pending Agreement matters (the "Record Retention Period"), each Party shall maintain, and allow inspection and monitoring by the other Party, and any other duly authorized agent of a governmental agency, of a complete file of all records, documents, communications, notes and other written materials, electronic media files, and communications, pertaining in any manner to the work or the delivery of services or goods hereunder.

B. Inspection

CWCB shall have the right to inspect DWR performance at all reasonable times and places during the term of this Agreement. DWR shall permit CWCB, and any other duly authorized agent of a governmental agency having jurisdiction to monitor all activities conducted pursuant to this Agreement, to audit, inspect, examine, excerpt, copy and/or transcribe CWCB's records related to this Agreement during the Record

Retention Period to assure compliance with the terms hereof or to evaluate performance hereunder. Monitoring activities controlled by CWCB shall not unduly interfere with DWR's performance hereunder.

7. CONFIDENTIAL INFORMATION-STATE RECORDS

Each Party shall treat the confidential information of the other Party with the same degree of care and protection it affords to its own confidential information, unless a different standard is set forth in this Agreement. Each Party shall notify the other Party immediately if it receives a request or demand from a third party for records or information of the other Party.

8. FAILURE TO PERFORM-DISPUTES

The failure of a Party to perform its respective obligations in accordance with the provisions of this Agreement is a breach of this Agreement. In the event of disputes concerning performance hereunder or otherwise related to this Agreement, the Parties shall attempt to resolve them at the divisional level. If this fails, disputes shall be referred to senior departmental management staff designated by each Party. If this fails, the executive director of each Party shall meet and attempt resolution. If this fails, the matter shall be submitted in writing by both Parties to the State Controller, whose decision shall be final.

9. NOTICE AND REPRESENTATIVES

Each individual identified below is the principal representative of the designating Party. All notices required to be given hereunder shall be hand delivered with receipt required or sent by certified or registered mail to such Party's principal representative at the address set forth below. In addition to, but not in lieu of a hard-copy notice, notice also may be sent by e-mail to the e-mail addresses, if any, set forth below. Either Party may from time to time designate by written notice substitute addresses or persons to whom such notices shall be sent. Unless otherwise provided herein, all notices shall be effective upon receipt.

CWCB
Todd Doherty
Department of Natural Resources
1580 Logan, Suite 200
Denver, CO 80203
Todd.doherty@state.co.us

DWR
Mary Halstead
Department of Natural Resources
1313 Sherman Street, Room 818
Denver, CO 80203
Mary.halstead@state.co.us

10. GENERAL PROVISIONS

A. Assignment

The rights and obligations of each Party hereunder are personal to such Party and may not be transferred, assigned or subcontracted without the prior, written consent of the other Party.

B. Order of Precedence

In the event of conflicts or inconsistencies between this Agreement and its exhibits and attachments, such conflicts or inconsistencies shall be resolved by reference to the documents in the following order of priority: Contract then Scope of Work.

C. References

All references in this Agreement to sections (whether spelled out or using the § symbol), subsections, exhibits or other attachments, are references to sections, subsections, exhibits or other attachments contained herein or incorporated as a part hereof, unless otherwise noted.

D. Third Party Beneficiaries-Negation

Enforcement of all rights and obligations hereunder are reserved solely to the Parties. Any services or benefits which third parties receive as a result of this Agreement are incidental and do not create any rights for such third parties.

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11. SIGNATURE PAGE

THE PARTIES HERETO HAVE EXECUTED THIS INTERAGENCY AGREEMENT

*** Persons signing for Parties hereby swear and affirm that they are authorized to act on behalf of their respective Party and acknowledge that the other Party is relying on their representations to that effect.**

STATE OF COLORADO
John W. Hickenlooper, Governor

Department of Natural Resources Division of Water Resources Signature By: Scott C. Cuthbertson, Deputy Engineer Date: 8/22/12	Department of Natural Resources **Mike King, Executive Director** Signature By: Tom Browning, Assistant Director Intergrated Resources, CWCB Signatory avers to the State of Colorado or delegate that Grantee has not begun performance or that a Statutory Violation waiver has been requested under Fiscal Rules Date: 8/22/12

ALL CONTRACTS REQUIRE APPROVAL BY THE STATE CONTROLLER

STATE CONTROLLER
David J. McDermott, CPA

By: Susan Borup
Susan Borup, DNR Controller

Date: 8/30/12

EXHIBIT A-STATEMENT OF WORK AND BUDGET

EXHIBIT A

Alluvial Aquifer Accretion/Depletion Analysis Tool (AAADAT)

PROJECT SCOPE OF WORK

PROJECT PURPOSE

The ever increasing demand for water along the Front Range, exacerbated by the drought of 2002, has resulted in the development of a number of augmentation plans relying upon recharge accretions as the primary source of replacement water. An augmentation plan allows structures, such as alluvial wells, to divert water even when the structure's water rights are out-of-priority by providing a replacement supply of water to the in-priority structure impacted by the out-of-priority diversion. Impacts from the diversion on the river are termed "depletions" in that they deplete the amount of water available in the stream to the vested surface water rights. Additions to the stream from recharge are known as "accretions". The objective of the augmentation plan is for the accretion to equal or exceed the out-of-priority depletion.

Currently, the Colorado Division of Water Resources (CDWR) must rely on accounting from the augmentation plans to determine whether or not a sufficient amount of accretions were provided at the time and location required to prevent the vested water rights from being impacted by the out-of-priority depletion. Such accounting, however, is typically not submitted until at least 30, and sometimes 60, days after the depletion has impacted the river.

This tool provides the water commissioner with the ability to determine whether or not depletions are being adequately replaced by accretions. It will also enable the water commissioner to quickly assess any claims regarding the right to divert "excess" accretions, as some recharge plans have the decreed right to use such accretions. Without such a tool, the division is unable to effectively administer such rights or to assure that vested water rights are not being impacted by the out-of-priority diversions.

In addition to the above specific objective, the tool will be able to relate any off-stream diversion or release of water to the stream provided the relationship can be characterized by a response function. For instance, the tool could also be used to determine accretions of return flow credits from the seepage of transbasin water from a ditch back to the stream. The tool simply calculates the accretion/depletion associated with diversion record data by means of a stored response function.

PROJECT AUTHORIZATION

CDWR, with the Colorado Water Conservation Board (CWCB) as the co-applicant applied for statewide funds from the Water Supply Reserve Account (WSRA) grant program to complete the AAADAT Project. This WSRA grant application was approved by CWCB on March 15th, 2011. This grant is for $200,000 for a contractor to complete the project. As part of this grant CDWR will provide a $50,467 match in the form of in-kind services.

INTRODUCTION AND BACKGROUND

AAADAT, as developed under this scope, will calculate the accretion/depletion of off stream diversions. The output from AAADAT will be used by water administrators, in conjunction with known daily on-stream activity, to assure that an adequate supply of replacement water has been provided to the vested water rights or enable the administration of any other return flow. It will also enable other water users to independently assess any claims regarding "excess" accretions.

AAADAT – Project Scope of Work

This scope outlines full development of the Alluvial Aquifer Accretion/Depletion Analysis Tool (AAADAT) in a server-database environment and a web-based user interface. AAADAT will be completed as a new tool under Colorado's Decision Support System. The fully developed tool will use HydroBase as the primary source of dynamic input data and will store, as necessary, additional information that is not currently maintained in HydroBase.

A prototype tool was developed by Leonard Rice Engineers, Inc. for the Colorado Division of Water Resources in the summer of 2010. The Excess Accretions Tool was developed as a prototype to 1) demonstrate the ability to create such a tool and 2) to provide information to water users and water administrators about the impacts that a fully implemented tool would have on their ability to plan and administer augmentation plan operations on a daily basis. The prototype tool was viewed as a success on both accounts and was well received by both water users and water administrators. It is anticipated that a basin wide implementation of this tool will provide high value to both water users and water administrators.

TASKS

The following tasks will structure the work under this scope:

1. Contractor Procurement
2. Project Administration and Meetings
3. Initial Needs Assessment
4. Server Database Structure and Logic Implementation
5. Web Interface Development
6. Data Reports Development
7. Data Loading Tool
8. Testing and Follow-up Needs Assessment
9. Web Hosting Transition Support
10. User Guide and Technical Documentation

These tasks are described in detail below.

TASK 1 – Contractor Procurement

Description of Task

CDWR staff will procure a contractor to implement the project. The selected contractor will perform all the subsequent tasks with oversight from CDWR staff. CDWR will follow all contracting protocols required by the State Controller.

TASK 2 – Project Administration and Meetings

Description of Task

Kick-off meeting with project partners including the CDWR and CWCB, to discuss the timeline and set list of immediate tasks. Several issues need to be reviewed including eventual software hosting, maintenance and upgrades.

Monthly progress meetings throughout the project will be conducted to discuss the ongoing work and

budgetary items.

Method/Procedure

The division will arrange a kick-off meeting in Denver following receipt of the notice to proceed (NTP). Monthly progress meetings will be coordinated by the project partners and contractor.

Deliverable

Meeting minutes will be drafted for each meeting by CDWR staff.

TASK 3 – Initial Needs Assessment

Description of Task

During the kick-off meeting and in follow up discussions, the needs to be met by the tool will be defined. These needs will guide development of functionality and user experience.

Method/Procedure

The needs assessment will be conducted in four parts:

1. The needs assessment will begin with the kick-off meeting and include project partners who helped with the prototype development and data population. Feedback will be provided from the meeting participants regarding what worked and did not work in the prototype tool and what functionality was missing completely.
2. Future users will also be consulted to acquire their expectations and requirements.
3. A full "wish list" of tool functionality will be developed and reviewed with the project partners, pared down to a final list, and prioritized so that the most essential features are ensured to be completed within the budget.
4. A written needs assessment document will be developed defining what AAADAT Tool functionality will be developed under this scope.

Two additional functionalities have already been identified by the water user community and should be incorporated into the AAADAT tool:

1. Projection functionalities should be incorporated into the user displays and program logic. Water users have identified the need to incorporate projected diversions into the impact analysis. Hydrobase already allows input of projected data and AAADAT should be designed to incorporate and display this data.
2. Options for multiple response functions should be incorporated into the input displays and program logic. For example, one recharge well may have three response functions; one for a dry year, one for a wet year and one for an average year. AAADAT needs to allow entry and storage of multiple response function and provide a mechanism to select the appropriate response function to use.

Tasks 4 – 10 are dependent on the completion of this task.

Deliverable

Needs Assessment Document will be provided in Microsoft Word and PDF formats and in hardcopy if desired.

TASK 4 – Server Database Structure and Logic Implementation

Description of Task

The database structure and logic developed for the prototype will be reviewed and evaluated for suitability in a server/web-interface environment. The prototype framework will be used as a starting point and enhanced as necessary to support multiple users and a web-based interface. In addition, code that was written for the prototype in Microsoft Access will need to be migrated into an appropriate database/development environment.

Method/Procedure

A SQL Server database will be created and initially populated with the same structure built for the prototype tool. As the development of the tool progresses through Tasks 4, 5, and 6, additions will be made to the structure and supporting code as necessary.

Deliverable

Written technical documentation describing the database structure and supporting code will be developed and maintained throughout the project and provided as part of the final project deliverable.

TASK 5 – Web Interface Development

Description of Task

The needs assessment developed in Task 2 will be relied upon to guide development of a web-based user interface for the AAADAT. The interface will provide user access to reports that calculate net accretions in the river based on user specified inputs.

Method/Procedure

The web interface will provide users with secure (log-in) access if needed. Users will not need to install local software beyond a current web browser to be able to use this web-based tool.

The interface development will be completed in three phases to allow for feedback:

1. Development of a simple interface that may not be completely functional but includes "mock-up" versions of each feature defined in the needs assessment. Project partners will be asked to review the first version and provide comments on general layout and content.
2. Incorporate the feedback from the simple interface and complete functionality throughout the site. This phase will be concurrent with the first phases of Tasks 6 and 7. Project partners will then be asked to test the site again, and some end users will be invited to participate in this testing phase as well.
3. Incorporation of feedback from the second testing run and development of a User Guide.

Deliverable

A secure and accessible website will be provided at the end of this task and will include User Documentation as well as a downloadable User Guide in Microsoft Word and PDF formats.

TASK 6 – Data Reports Development

Description of Task

The primary way users of the AAADAT will look at information generated by the tool will be in on-line reports. This task covers development of the underlying database structure that will support the reports, and the middle-ware code that will provide the web interface with a means of pushing report filters and constraints into the tool and pulling back the report results to the screen. The reports to be included in the AAADAT will be defined in the needs assessment. It is currently anticipated that three reports will be needed:

1. high level summary view of the data,
2. more detailed summary view, and
3. full details view.

Method/Procedure

The reports will be developed in two phases. This first phase will progress at the same time as the second phase of Task 5 so that functional reports will be available during the second testing run. The second phase will include incorporation of the feedback from the testing.

Deliverable

Implemented data reports into the AAADAT web interface.

TASK 7 – Data Loading Tool

Description of Task

To allow AAADAT to be fully developed and tested independently, this task includes development of a process for loading data into the tool from files that can either be manually or automatically prepared from the CDWR/OIT system, much like the nightly generation of the river calls file is done now.

Other information will also need to be loaded into AAADAT by a system administrator, including user login information, association of users with content they are allowed to access, and decree specific data related to augmentation plans that are not currently stored in HydroBase. Under this task, a process will be developed to assist a system administrator with these data loading tasks.

It may also be considered, as part of the needs assessment, that some data needed by the system is appropriate for entry by end users. If that is the case then this task will also cover the development of custom user forms for data entry and supporting database and code to handle management of user entered data.

Method/Procedure

The data needed from HydroBase will be defined and documented in the needs assessment. The contractor will work with CDWR/OIT to establish an efficient means of retrieving data.

For system administrator data management, it is likely more time will be spent on documenting the processes than on building custom forms. Data management within the tools being developed for this project will need the ability to be managed by a technical person with the admin tools that are built-in to the systems and supplementary documentation support.

Deliverable

A functional data loading process, including full documentation available online through the website or downloadable in a Microsoft Word and PDF formats, will be available at the end of this task.

TASK 8 – Testing and Follow-up Needs Assessment

Description of Task

Testing will be included throughout Tasks 4, 5, and 6. After the first round of testing, the needs assessment document will be modified if necessary.

Method/Procedure

A first round of testing will include review by project partners of a mock-up version of the AAADAT web interface. The purpose of this review will be to solicit comments on the general layout and content of the tool before investing too much time in functional development. Based on the feedback from this round of testing, the needs assessment document will be modified if necessary and then development of functionality on the site will begin.

At the same time as site functionality is being developed, the reporting and data loading features will be developed and once in place a second round of testing will begin. This testing period should include project partners as well as end users and other stakeholders if possible. This testing will flush out functionality issues in the site and provide another batch of feedback on the content and layout.

Deliverable

A modified needs assessment document may be generated by this task. A technical memo will be provided that lists each comment or issue provided by testers and the resolution that was implemented to address it.

TASK 9 – Web Hosting Transition Support

Description of Task

The consultant will provide support and training to those responsible for the long term support of the website.

Method/Procedure

One workshop will be conducted by the consultant to provide a bulk of the information to those responsible for the long term support of the website. Continued support from the consultant will be provided, as needed, on an ongoing basis, limited by the terms of the contract.

Deliverable

The consultant will provide 60 hours of hosting support.

TASK 10 – User Guide and Technical Documentation

Description of Task

A User Guide will be accessible through the AAADAT website and downloadable as a Microsoft Word Document and PDF.

Method/Procedure

Documentation will be developed throughout the project, under each task as necessary. This task provides for final document preparation, layout, review by the project partners and incorporation of feedback, and document/PDF production.

Deliverable

All documents developed for this project will be made available electronically as Microsoft Word Documents and PDFs, downloadable from the AAADAT website or on CD as requested. Printed copies can be provided if requested by project partners.

PROJECT BUDGET

As shown in **Table 1**, an estimated budget was provided as part of the WSRA grant application. The selected contractor may provide changes or additional information on estimated hours, hourly rates, and other direct costs. However, the total cost must be equal to or less than $200,000.

Table 1
Estimated AAADAT Project Budget Provided in WSRA Grant Application

Example Project Personnel:	Contractor
Hourly Rate:	$160
Task 1 - Contractor Procurement	$0
Task 2 - Project Administration and Meetings	$6,000
Task 3 - Initial Needs Assessment	$10,000
Task 4 - Server Database Structure and Logic Implementation	$40,000
Task 5 - Web Interface Development	$50,000
Task 6 - Data Reports Development	$14,000
Task 7 - Data Loading Tool	$20,000
Task 8 - Testing and Follow-up Needs Assessment	$36,000
Task 9 - Web Hosting Transition Support	$10,000
Task 10 - User Guide and Technical Documentation	$14,000
Total Hours:	1250
Total Cost:	$200,000

* Other Direct Costs included as part of the estimate from Contractor shown as Personnel.

PROJECT SCHEDULE

An estimated schedule was provided as part of the WSRA grant application. Table 2 provides an estimated schedule based on CDWR's receipt of the notice to proceed from CWCB. The selected contractor may provide limited modifications to the schedule. However, the project must be completed within one year of the receipt of the contractor's notice to proceed.

Table 2
Estimated AAADAT Project Schedule

Schedule		
Task	Start Date	Finish Date
Task 1 – Contractor Procurement	NTP*	NTP+150 days**
Task 2 - Project Administration and Meetings	NTP	NTP + 515 days
Task 3 - Initial Needs Assessment	NTP + 180 days	NTP + 210 days
Task 4 - Server Database Structure and Logic Implementation	NTP + 210 days	NTP + 300 days
Task 5 - Web Interface Development	NTP + 210 days	NTP + 330 days
Task 6 - Data Reports Development	NTP + 300 days	NTP + 350 days
Task 7 - Data Loading Tool	NTP + 300 days	NTP + 380 days
Task 8 - Testing and Follow-up Needs Assessment	NTP + 300 days	NTP + 470 days
Task 9 - Web Hosting Transition Support	NTP + 400 days	NTP + 515 days
Task 10- User Guide and Technical Documentation	NTP + 400 days	NTP + 515 days

* NTP = Notice to Proceed

******The finish date for contractor procurement in the WSRA grant application was NTP+90 days. This date was extended to NTP+150 days to incorporate additional contracting time.

PAYMENT

Payment will be made based on actual expenditures and invoicing by the selected contractor. Invoices from any other entity (i.e. subcontractors) cannot be processed by the State. The request for payment will 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 5 percent of the entire water activity budget will be withheld from the contractor 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 CDWR 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.