AMENDMENT NO. 3 TO AGREEMENT

Project: Water Utility System Master Plan Update/Model Recalibration, Project No. 14-2141 / CIP No. 50819

Background Data: Original Contract Date: September 21, 2015
Owner: City of Rapid City
Consultant: Black and Veatch Corporation

Nature of Amendment:

This amendment modifies the project scope and fee as noted in Exhibits A and B as referenced below. This amendment includes:

Additional fee to cover development and preparation of a Feasibility Study for a new regional water booster station that is a component of the proposed East Anamosa Street Water Extension Tax Increment District (TID).

Current Contract Amount:	$1,472,189.00
Change Requested:	
Regional Booster Pump Station Feasibility Study	$43,674.00
Follow-Up Hydraulic Modeling Scenarios, If Necessary	$16,652.00
(Separate Notice To Proceed Required for Follow-Up Scenarios)	
New Contract Amount:	$1,532,515.00

Owner and Engineer hereby agree to modify the above referenced Agreement as set forth in this Amendment. All provisions of the Agreement not modified by this or previous Amendments remain in effect. The effective date of this Amendment is: _____.

The schedule to complete work covered under this amendment is:

Start Date: Authorization to proceed received from Owner.
Information Request Issued to Developer: 1 week after start date.
Information Request Filled and Determined Adequate: 2 weeks after start date.
Hydraulic Model Modifications: 4 weeks after start date.
Part 1 and Part 2 Evaluations: 8 weeks after start date.
Preliminary Results Review: 9 weeks after start date.
Follow-Up Hydraulic Modeling (If Necessary): 12 weeks after start date
Feasibility Study Technical Memorandum and Review: 15 weeks after start date
Council Presentation: First scheduled meeting after TM complete.

CITY OF RAPID CITY:

By: _____
Steve Allender, Mayor

Date Signed: _____

ATTEST:

By: _____
Pauline Sumption, Finance Director

Date Signed: _____

ENGINEER:

By:_____
Black & Veatch Corporation

Date Signed: _____

REVIEWED BY:

_____
Project Manager

EXHIBIT A

BLACK & VEATCH CORPORATION AMENDMENT NO. 3 TO AGREEMENT
FOR
WATER UTILITY SYSTEM MASTER PLAN UPDATE/MODEL RECALIBRATION
PROJECT NO. 14-2141 (CIP NO. 50819)

SCOPE OF SERVICES

Background:

East Anamosa Street Water Extension Tax Increment District

The Rapid City Common Council has approved a Tax Increment District (TID) Project Plan for the East Anamosa Street Water Extension. The purpose of the TID is to financially assist in the development of commercial, industrial, and residential property located between East North Street and Elk Vale Road, and north of Omaha Street. The initial development in this area is referred to as the Shepherd Hills Development. The increased tax increment generated from this TID will fund portions of the Owner's water distribution improvements, public/private power and utility relocations, and grade that portion of East Anamosa Street (a principal arterial on Rapid City's Major Street Plan) within the TID.

The two water main extensions proposed for installation in East Anamosa Street as part of the TID Project Plan include:

- A 20-inch main connected to the low-level pressure zone from East Philadelphia Street to Elk Vale Road. This water main will ultimately be connected to an existing water main (low-level pressure zone) in Elk Vale Road that is supplied from the existing Elk Vale Low-Level Reservoir east of the TID.
- A 16-inch main connected to the north rapid pressure zone from East Philadelphia Street to the eastern limit of the proposed Shepherd Hills Development. This water main will ultimately be connected to new water mains (north rapid pressure zone) along Elk Vale Road and connection to a future planned Elk Vale North Rapid Reservoir proposed in the current master plan to be located east of the TID.

Regional Booster Pump Station Feasibility Study

In addition to these two water mains, the TID Project Plan includes provisions for a new booster pump station (BPS) to serve the development with the intent to also serve in a regional infrastructure capacity within the TID and located near the intersection of East Philadelphia Street and East Anamosa Street. Due to existing capacity limitations in the north rapid pressure zone, the new regional BPS is needed to supply adequate water to the Shepherd Hills Development. The BPS will boost water from the low-level pressure zone to the north rapid pressure zone, serve portions of the Shepherd Hills development, and need to ultimately supply water to the future North Rapid Elk Vale Reservoir in an adequate capacity if it is to be considered for regional service in the future.

The location proposed for the new regional BPS in the TID Project Plan is different than its proposed location in the Owner's 2008 Utility System Master Plan. This amendment provides for

the development of a feasibility study that evaluates the location of the new regional BPS as proposed in the TID Project Plan, determines if that location is operationally feasible and acceptable, and defines impacts that may require additional water distribution system improvements outside of the TID boundary.

Scope of Services

Task A3.1 – Review Infrastructure Design Criteria Manual (IDCM) Criteria and Supplemental Design Criteria for Feasibility Studies and Regional BPSs with Owner

Conduct a review of the IDCM for relevant requirements related to feasibility studies and BPS design criteria. IDCM Section 3.10.2 describes the following components of a feasibility study:

- Description and purpose of project
- Justification for the facility and analysis of alternatives
- Facility's role as a regional facility and projected integration into the City's pressure zones and operational systems

IDCM Section 3.10.3 describes design criteria for water BPSs. Additionally, Section 3.4.18.4 of Attachment Seven, Supplemental Design Criteria describes supplemental criteria for water BPS.

Section 3.10.1 of Owner's IDCM defines a BPS as a regional facility that are to be designed, bid, constructed, and operated by the Owner. When a developer proposes a regional facility, a feasibility study and analysis is required for review by Owner's staff and approval by the Rapid City Council. If Council approves the feasibility study, then Owner's staff is directed to prepare a Development Agreement to define implementation (scope, schedule, budget) of the regional facility. Once the Development Agreement is executed, Owner's staff retains the services of an Engineering Design Consultant to prepare a detailed design report, drawings and specifications for construction, and contract/bidding documents.

This amendment only provides for services to develop and prepare the feasibility study. All subsequent phases and information traditionally provided as part of those subsequent phases is not included in this amendment's scope of services.

Task A3.2 – Submit Information Request to Shepherd Hills Developer

Submit an information request to gather and compile the most current version of the planned development including but not limited to:

1. TID Project Plan. This item will provide general background information on the proposed development.
2. ArcGIS shapefiles or AutoCAD drawings of the development's proposed water distribution infrastructure (mains, BPS location, connections to existing system, etc.). This information will be used to create the proposed development's water system configuration in the Owner's existing hydraulic model.
3. Developer projected water demands on a per capita basis, per unit basis, per acre basis, etc. in accordance with IDCM requirements.

4. Anticipated phasing of the planned development indicating incremental development steps within both the primary Phase 1 and Phase 2 development as well as the projected timeline for the incremental development.
5. Projected demands for components of the incremental development steps for average day, maximum day, and peak hour demand flow rates. Information in items 3 and 4 will be used to define "Day-1" service demands (minimum pumping capacity), initial Phase 1 BPS capacity, and timing of demand growth from initial development through Phase 2.

Task A3.3 – Hydraulic Model Modifications

Through the current water utility system master plan effort, an existing hydraulic model will be utilized for work covered by this amendment. The existing hydraulic model has a physical piping and facilities configuration based on 2018 data and an applied demand from 2015 metered sales data. Demands in the low-level and north-rapid pressure zones will be incrementally increased so that they represent an estimate of the 2025 zone demands.

Based on information provided by the Shepherd Hills Developer, modify configuration of the existing hydraulic model to incorporate piping and regional BPS components proposed for the Shepherd Hills Development. No other changes (i.e. piping updates, facility updates, etc.) to the existing hydraulic model will be made for this feasibility study.

Task A3.4 – Shepherd Hills Development Water Demand Confirmation and Allocation to Hydraulic Model

Using information provided by the Shepherd Hills Developer, compile water demands anticipated for Phase 1 and Phase 2 of the planned development.

Review demands with Owner and define Phase 1 and Phase 2 average day demand as well as max-day:avg-day peaking factor and peak-hour:avg-day peaking factor to be used for demands from the Shepherd Hills Development. Hydraulic modeling for the feasibility study will be based on one set of average day demand data and one set of peaking factors for the planned development. Alternate evaluations with different demand sets or peaking factors are not included.

For both Phase 1 and Phase 2 of the Shepherd Hills Development, allocate maximum day demand and assign a 24-hr demand pattern using the existing hydraulic model demand pattern for the north rapid pressure zone to corresponding demand nodes in the hydraulic model. Estimated changes to the low-level and north rapid pressure zone demands between 2015 and 2025 will be made using global demand factor increases. No changes to the existing model's demand allocation or demand patterns will be made as part of this feasibility study.

Confirm 24-hr extended period simulation (EPS) functionality of the hydraulic model with Shepherd Hills Development demands included. Review with Owner the water supply scenario to be used during the feasibility study (i.e. flow rate contributions from Jackson Springs WTP, Mountain View WTP, and groundwater wells.

Task A3.5 – Hydraulic Model Evaluation - Preliminary

Conduct hydraulic modeling to evaluate the feasibility of the regional BPS located within the TID for the Shepherd Hills Development (i.e. near the intersection of East Philadelphia Street and East Anamosa Street). Components of the feasibility evaluation and hydraulic modeling will include:

1. Part 1 Evaluation - Shepherd Hills Development at Buildout (Phase 1 and 2) with a new regional BPS in service but without a new North Rapid Elk Vale Reservoir or Connection to Piping in Elk Vale Road:
    - BPS capacity including number of pumps, pumping rates, discharge head, and suction head.
    - Determine if the BPS can operate adequately without the future North Rapid Elk Vale Reservoir in service or is additional storage required. Analyses will include a comparison of hydraulic modeling operating results to IDCM criteria for pressure, velocity, and storage utilization.
    - Existing North Rapid Reservoir fluctuation/utilization and adequacy of existing storage volume for equalization, emergency, and fire flow storage components.
    - Adequacy of size and configuration of proposed piping connections between the Shepherd Hills Development and the existing water distribution system near East Philadelphia Street and East Anamosa Street.
    - Redundant connections desired to low-level pressure zone piping to enhance reliability of the low-level pressure zone supply to the new regional BSP.
    - Operational interaction of the new regional BPS with the existing North Rapid BPS.
    - Operational interaction of the new regional BPS and filling of existing Elk Vale Reservoir and Signal Hill Low-Level Reservoirs.
    - Impacts of the new regional BPS on pressure and velocity constraints in low-level pressure zone piping to determine if upsizing of mains is required.
    - Impacts of the new regional BPS on adequacy of supply to Ellsworth AFB at the contracted 24 hour flow rate.
    - Develop a north rapid and low-level pressure zone map showing improvements needed as a result of implementing the new regional BPS.
    - The following assumptions are made for the Part 1 evaluation:
        - Mt. View WTP will be utilized up to 8 MGD vs 16 mgd total capacity
        - Well No. 8 is assumed out of service
        - Other water supply sources in the low-level pressure zone are assumed to be operational (Jackson Springs WTP, groundwater wells) at normal operating rates.
        - Low-Level pressure zone support of 500 gpm is assumed to be provided through the manually operated valve (flow from north rapid pressure zone to low-level pressure zone)
        - Harmony Heights check valve is assumed closed
        - North Rapid BPS pipe improvements are not in place; therefore, North Rapid BPS provides a maximum of 3,600 gpm
        - Signal Hill Reservoir inlet valves will be modeled as sleeve valves

2. Part 2 Evaluation - Shepherd Hills Development at Buildout (Phase 1 and 2) Plus City Provided Infrastructure for the North Rapid Elk Vale Reservoir and Connection to Piping in Elk Vale Road as well as other system improvements previously identified as necessary:
    - BPS capacity including number of pumps, pumping rates, discharge head, and suction head.
    - Reservoir fluctuation/utilization and adequacy of storage volume (2 reservoirs) for equalization, emergency, and fire flow storage components. Analyses will include a comparison of hydraulic modeling operating results to IDCM criteria for pressure, velocity, and storage utilization.
    - Adequacy of size and configuration of proposed piping connections between the Shepherd Hills Development and the existing water distribution system near East Philadelphia Street and East Anamosa Street.
    - Redundant connections desired to low-level pressure zone piping to enhance reliability of the low-level pressure zone supply to the new regional BPS.
    - Operational interaction of the new regional BPS with the existing North Rapid BPS.
    - Operational interaction of the new regional BPS and filling of existing Elk Vale Reservoir and Signal Hill Low-Level Reservoirs.
    - Impacts of the new regional BPS on pressure and velocity constraints in low-level pressure zone piping to determine if upsizing of mains is required.
    - Impacts of the new regional BPS on adequacy of supply to Ellsworth AFB at the contracted 24-hr flow rate.
    - Develop a north rapid and low-level pressure zone map showing improvements needed as a result of implementing the new regional BPS.
    - The following assumptions are made for the Part 2 evaluation:
        - Mt. View WTP will be utilized up to 8 MGD vs 16 mgd firm capacity.
        - Well No. 8 is assumed to be operational.
        - Other water supply sources in the low-level pressure zone are assumed to be operational (Jackson Springs WTP, groundwater wells) at normal operating rates.
        - Low-Level pressure zone support from the north rapid pressure zone is assumed to be zero. Stop support from north rapid pressure zone to low level pressure zone.
        - Harmony Heights check valve is assumed closed.
        - Future North Rapid Elk Vale Reservoir and pipe connectivity.
        - Future piping connectivity from north rapid and low-level pressure zone piping in the Shepherd Hills development to connections of existing and future piping in Elk Vale Road.
        - Signal Hill Reservoir inlet valves will be modeled as sleeve valves.
        - Pipe improvements related to increasing capacity of the existing North Rapid BPS to 3,900 gpm. Owner will provide the piping configuration that has been previously identified by others.

3. For both Part 1 and Part 2 hydraulic modeling efforts, define supplemental system improvements that are recommended to provide an adequate level of service in the north rapid and low-level pressure zones when the Shepherd Hills Development and new regional BPS are incorporated into the water distribution system. Using the results from Part 1 and

Part 2 modeling as well as those available from the calibrated hydraulic model, characterize whether recommended improvements are needed because of the new Shepherd Hills TID development or are needed because of existing system deficiencies unrelated to the Shepherd Hills TID development.

Task A3.6 – Progress Meeting: Preliminary Results Review

Conduct a web-based progress meeting to review preliminary hydraulic modeling results, identify system and/or operating deficiencies, and discuss supplemental system improvements.

Review and discuss scenarios for follow-up hydraulic model evaluations to conduct, if any.

Prepare meeting minutes to document discussion, meeting results, and action items.

Task A3.7 – Follow-Up Hydraulic Modeling Scenarios and Progress Meeting (If Necessary)

A separate notice to proceed is required prior to beginning work on this task. Owner will issue the notice-to-proceed in writing to Engineer authorizing work to proceed.

Conduct follow-up hydraulic model evaluations for up to 3 alternative scenarios to address questions, evaluate alternative ideas for piping and/or facilities, or to optimize the water distribution system configuration as it relates to supplying water from the new regional BPS to the north rapid pressure zone and the Shepherd Hills Development.

Conduct a web-based progress meeting to review the follow-up modeling scenarios and define recommendations to be included in the Feasibility Study Technical Memorandum (TM).

Task A3.8 – Feasibility Study Technical Memorandum

Document hydraulic modeling results and recommendations in a Feasibility Study TM. Submit draft TM to Owner and internal QA/QC team for review and comment. Owner will transmit draft TM to Shepherd Hills Developer for review.

The TM will be based on the following outline which are described in Section 3.4.18.3.1 of Owner's Attachment Seven, Supplemental Design Criteria, 3.4.18 – Regional Water Facilities:

- Description and project purpose
- Justification for the facilities and analysis of alternatives
- Facility's role as a regional facility and projected integration into the City's identified service zones and systems

Review comments with Owner and revise TM with changes agreed to. Submit final TM to Owner

Task 3.9 – Council Presentation: Feasibility Study Results

From the Feasibility Study TM, prepare a Power Point based Feasibility Study Summary Presentation to summarize the study's results and recommendations. Submit draft presentation to Owner and internal QA/QC for review and comment.

Review comments with Owner and presentation with changes agreed to. Submit final presentation to Owner for inclusion into a City Council meeting packet.

Attend a City Council meeting to present the Feasibility Study Summary Presentation to the City Council.

EXHIBIT B

BLACK & VEATCH CORPORATION AMENDMENT NO. 3 TO AGREEMENT FOR WATER UTILITY SYSTEM MASTER PLAN UPDATE/MODEL RECALIBRATION, PROJECT NO. 14-2141 (CIP NO. 50819)

FEE ESTIMATE SUMMARY

TASK	SERVICES	FEE
Additional Effort Items		
A3.1 to A3.6 A3.8 to A3.9	Regional BPS Feasibility Study	$43,674.00
A3.7	Follow-Up Hydraulic Modeling Scenarios, If Necessary (Separate Notice To Proceed Required to Commence)	$16,652.00