TASK ORDER NO. 10022.a

Pursuant to the

MASTER AGREEMENT FOR PROFESSIONAL SERVICES
BETWEEN

CITY OF MERIDIAN (OWNER) AND BROWN AND CALDWELL (CONSULTANT)

This Task Order is made this 7th day of February, 2023 and entered into by and between the City of Meridian, a municipal corporation organized under the laws of the State of Idaho, hereinafter referred to as "City", and accepted by BROWN AND CALDWELL, INC., hereinafter referred to as "Consultant" pursuant to the mutual promises, covenant and conditions contained in the Master Agreement (category 2a) between the above-mentioned parties dated October 1, 2020. The Project Name for this Task Order is as follows:

WRRF FACILITY PLAN UPDATE

PROJECT UNDERSTANDING SUMMARY

The City of Meridian (City) is upgrading the Meridian Wastewater Resource Recovery Facility (WRRF) to respond to growth in the service area and to increase the level of treatment to meet lower Idaho Pollutant Discharge Elimination System (IPDES) effluent permit limits for total phosphorus (TP) and ammonia. In order to properly plan for both short- and long-term improvements necessary to meet these IPDES permit requirements, the City is completing a Facility Plan Update to supplement their previous facility plan completed in 2018. This Facility Plan Update will also serve to prepare the necessary planning and alternative evaluation documentation needed for regulatory approval and will incorporate all portions required by Idaho Department of Environmental Quality.

The Facility Plan Update will include the following tasks:

- Task 1 – Project Management
- Task 2 – Facility Plan

SCOPE OF WORK

Task 1 Project Management

1.1 Project Management Activities

Objective. To manage, administer, and provide ongoing coordination for utilization of resources for the project. This task includes technical and financial management of the contract and acting as liaison with the City, operational staff, and project team.

Approach. Major activities include the following:

- All communication from the consultant regarding the project will include the City project manager (PM) or designee. The City PM will be responsible for coordinating and providing all review comments and the resolution of all issues to the Engineer in a timely manner (typically 14 calendar days for design review); all other decisions will be provided to the Engineer within 7 calendar days or less. The Engineer PM will be responsible for drafting meeting minutes.
- The Engineer will document any and all requested changes to the scope of work using a Project Change Request form. The Engineer PM will collaborate with the City PM to develop an approach for addressing the change(s). The City PM will review all changes for approval and provide the Engineer with written approval prior to modifying the existing scope, schedule, or budget and prior to proceeding with any new or unscoped work activities.
- This subtask includes the following activities:
    - Develop a Project Management Plan and Quality Plan for internal use.
    - Prepare monthly project status reports. Progress reports will identify budget status, progress status, activities of the previous month, and upcoming activities.
    - Attend project kickoff meeting with City staff.
    - Attend up to four (4) coordination meetings with City staff.

City Responsibilities. Provide the following:

- Identification of a PM with final authority for City decisions.
- Timely review of products and decisions on issues critical to scheduled progress.
- Identification and involvement of appropriate City staff.
- Coordination of collected comments and resolution of any conflicting comments from all City reviewers prior to returning to the Engineer.

Deliverables. Deliverables for the tasks listed above include the following items:

- Monthly progress reports and invoices
- Meeting minutes, as required

1.2 City Workshops

Objective. Present the progress made on the Facility Plan and review key decisions and recommendations with City staff.

Approach. Major activities include the following:

- Prepare for and conduct up to five (5) workshops with City staff through the life of the project to communicate progress made on the Facility Plan Update, review pertinent key topics, and plan next steps. Each workshop is assumed to be 3 hours in duration. It is assumed that two (2) workshops will require the attendance of one out-of-town BC team member. All workshops will have up to four BC team members in attendance.

- Document the workshops and provide a summary of action items to team members at the conclusion of each workshop.

Deliverables.

- Workshop agendas, materials, minutes, and summary of action items.

1.3 Quality Assurance/Quality Control (QA/QC)

Objective. Present the progress made on the Facility Plan and review key decisions and recommendations with City staff.

Approach. Major activities include the following:

- Implement a QA/QC program as defined in the Quality Plan to review products from this scope. City and regulatory agency review comments will also be incorporated to prepare and complete the final facility plan documents. Additionally, the City is assumed to participate in this process and provide independent review of products.
- Consultant will provide appropriate calculation and deliverable QA/QC reviews by in-house, senior staff members.

Task 2 Facility Plan

2.1 Investigate Existing Wastewater System Conditions

Objective. To present the current and currently planned (in design or construction) systems for the Meridian WRRF, including capacity of each major unit process.

Approach. Major activities include the following:

- Identify the existing City planning area.
- Conduct a survey of the existing facilities with Meridian staff. Include in this:
  - Discuss equipment condition/age based on interview with WRRF operations and maintenance staff.
  - Incorporate results of the 2020 Fermenter Analysis when determining carbon demand/chemical storage capacity.
  - Incorporate current upgrades for existing aeration basins, Digester 6, sidestream phosphorus, and tertiary filtration that are in design or construction for updating existing system capacity.
  - Incorporate existing water reuse practices.
  - Discuss existing environmental conditions in the planning area.
  - Incorporate a discussion on the limitations of the existing outfall system to the Boise River.
  - Provide description of current IPDES permit.
- Review the last 5 years of historical influent flows, loads, and population in the City
- Review any planned flow reduction measures for the City, including:
  - I&I reductions in the collection system

  - Water conservation around the City
  - Water conservation requirements for new and existing housing developments, commercial developments, and industries within the City
- Related water quality planning documentation, including:
  - State water quality requirements for receiving waters in the service area
  - Designated uses for receiving waters
  - Water quality and technology based effluent limitations
  - Current TMDL issues for the receiving waters as they relate to future IPDES permit limitations
  - Related City water resources planning (if different from 2018 facility plan)
  - Related air quality permits

City Responsibilities. Provide the following:

- Provide daily historical operating data for the past five (5) years.
- Provide the most recent set of facility flow and loading projections.
- Attend operation/maintenance staff interview meeting to discuss equipment condition/age.
- Provide access to WRRF design data, including drawings, equipment submittal documents, product data, and relevant plans and studies, upon request.

Deliverables.

- Chapter(s) in the Facility Plan summarizing findings of this subtask.

2.2 Wastewater Characterization

Objective. To collect and organize WRRF liquid and solids stream data for recalibration of the WRRF's BioWin model.

Approach. Major activities include the following:

- Prepare a sampling plan for a 14-day wastewater characterization to be conducted at the WRRF. Sampling will include daily grab and composite sampling of multiple constituents at several points in the WWRF's liquid and solids treatment processes. It will also include one day of diurnal sampling for select constituents. Wastewater characterization data will be used to calibrate biological process models in the capacity assessment described below.
- Hold a meeting to discuss the sampling plan and to distribute responsibilities between BC, the City, and contract laboratories.
- Coordinate the conduct of the sampling, providing direction to City staff regarding sampling times and locations.

City Responsibilities. Provide the following:

- Review and comment on the wastewater characterization sampling plan.

- Participate in the wastewater characterization meeting.
- Collect wastewater characterization samples, conduct laboratory analyses, and send samples to contract laboratories (as required).

Deliverables.

- Wastewater sampling plan.
- Chapter(s) in the Facility Plan summarizing findings of this subtask.

2.3 Capacity Assessment Update

Objective. To update the total capacity of the WRRF operating as designed, with all units in service, as well as the IDEQ-defined firm capacity with the largest of each type of process unit out of service. Also to prioritize processes for optimization and upgrade.

Approach. Major activities include the following:

- Construct a solids mass balance based upon historical data and data obtained during the wastewater characterization. Assess mass balance closure across various WRRF unit processes in order to determine data gaps, irregularities, or inconsistencies in the data record. Use calibrated mass balance to project system loadings for use in the following tasks.
- Update the WRRF hydraulic profile as needed, using Visual Hydraulics software. Portions of the profile were updated for Aeration Basins 9-10/1-4 Retrofit project.
- Update the primary sedimentation performance model to project loadings to the secondary process. This will include a statistical correlation of recent historical TSS and BOD removals with hydraulic and mass loading.
- Calibrate BioWin activated sludge process model with data collected during the wastewater characterization.
- Use calibrated BioWin models to simulate performance across a range of flows and loads, for up to a maximum of two (2) different operating conditions, as selected by the City. Conditions may include the following variables:
    - Seasonal condition: summer, winter
    - Effluent target condition: final permit
    - Units in service: primary clarifiers, aeration basins, secondary clarifiers, fermenter (or just chemical), tertiary filters
- Use the updated models to project a suite of WRRF parameters, including effluent characteristics, effluent loadings, secondary clarifier loadings, WAS flow and loadings, and RAS flows.
- Update the secondary clarification system state point analysis (SPA) model using recent WRRF historical data. The SPA model is a graphical approach to determining secondary clarifier capacity, with no sampling or onsite testing. The model depends upon flow, mixed liquor settleability (characterized via the sludge volume index [SVI]), clarifier surface area, and RAS flow rate. The model does not account for unique clarifier geometry including center wells, launders, depth, or energy dissipating inlet

structures. Use the calibrated SPA model, in concert with the biological model outputs, to project the capacity of the secondary clarifiers.

- Update the capacity of the solids handing treatment processes as needed, including DAFT, fermentation, digestion, and dewatering. Capacity will be evaluated through analysis of plant historical data and manufacturer's rated capacities of unit processes, with no onsite sampling or testing.
- Update the capacity of the disinfection and tertiary filtration systems using vendor specifications, design calculations, and plant performance data.
- Combine the information from all above items in this subtask to form an integrated assessment of the plant capacity and bottlenecks, with a prioritized list of bottlenecks and composite rating diagrams.

City Responsibilities. Provide the following:

- Provide access to Plant design data, including drawings, equipment submittal documents, product data, and relevant plans and studies, upon request.
- Provide operating levels and typical recycle rates for unit processes as needed.
- Conduct water surface elevation measurements as needed.
- Review and comment on the capacity recommendations.

Deliverables.

- Chapter(s) in the Facility Plan summarizing findings of this subtask.

2.4 Planning Criteria

Objective. Identify the planning criteria for use in alternatives evaluation and capital improvements planning for the Facility Plan.

Approach. Major activities include the following:

- Use the population and industry growth flow and loading projections developed as part of the Sewer Master Plan Update.
- Develop projections for primary and secondary solids production based on flow and load projections from the Sewer Master Plan Update.
- Develop/update projections for biogas production based on digestion technology and solids production projections.
- Establish future discharge split to water reuse vs. Five Mile Creek.
- Discuss potential future discharge criteria, including nutrients, microconstituents/compounds of emerging concern, and per- and polyfluoroalkyl substances (PFAS).
- Establish potential future discharge criteria for IPDES discharge or reclaimed water permits for anticipated flows and loads, depending on point of final discharge.

Deliverables.

- Chapter on future conditions for the Facility Plan.

2.5 Liquid and Solids Treatment Analysis

Objective. Evaluate alternatives for upgrading the Meridian WRRF to meet planning criteria requirements for both liquids and solids streams.

Approach. Major activities include the following:

- Based on revised capacity assessment and flow/load projections, update timeline presented in 2018 facility plan for adding clarifiers and aeration basins, along with digesters and solids handling processes.
- Evaluate potential energy and chemical-saving liquid stream process improvements, including ammonia-based aeration control (ABAC), low DO aeration basin operation, and hydrocyclone wasting. Do not evaluate future new technologies for biological treatment expansion (i.e., no evaluation of IFAS alternatives for expansion).
- Update discussion and cost analysis (AACE Class 5) for a secondary road access to the treatment facility from the North or West side of the facility.
- Evaluate solids-stream discharge improvements, including planned dryer upgrades and biogas expansion project. Provide planning level (AACE Class 5) cost estimate for alternatives identified for the solids system expansions.
- Provide costs for liquid process expansion based on the Aeration Basins 9-10/1-4 Retrofit design project.
- Provide rough site plan showing plant layout for recommended alternatives. Include preliminary site planning for future facilities on the 40 acres owned by the City north of the WRRF. Site plans will not be done in CAD.
- Recommend alternatives based on cost evaluation and input from the City. For the final selected alternatives for the facility (both solids and liquids):
  - Identify any site security limitations/requirements.
  - Identify future aesthetic needs for the facility (odor control, noise control, traffic control on and off site).
  - Provide a staffing and organization evaluation, including future needs for staffing, organization of the utility, and projected costs of O&M for the expansion option.
  - Provide an evaluation of non-treatment process needs, including administrative office space, lab space, maintenance space, and equipment storage space. This will include an evaluation of the future of the mechanical building, including the limitations and constraints (e.g., electrical and communications) that could trigger a need to change or reorganize the functions that reside there.
  - Incorporating findings of other City studies into utility systems. These would include non-potable water, gas, communications, and electrical systems within the site.

Deliverables.

- Report chapters for discussion of alternatives and recommendation for expansion to be incorporated into the Facility Plan report.

2.6 Other Related Evaluations

Objective. Reference previous evaluation for resource recovery options and options for potential future permit limits not in the current permit.

Approach. Major activities include the following:

- Reference and provide brief update on Resource Recovery Study from 2018 Facility Plan. No additional resource recovery evaluation will be conducted.

Deliverables.

- Brief report section to be incorporated into the Facility Plan report.

2.7 CIP

Objective. Prepare a Capital Improvements Plan (CIP) for the Meridian WRRF that provides a clear outline of the regulatory-required and maintenance/age related replacement projects between 2023 and 2043 (including estimated cost and approximate year for initiation of each project). It is assumed the City will complete their own financial options evaluation for funding of projects.

Approach. Major activities include the following:

- Based on the recommendations from Subtask 4, assess the delivery methods for project delivery for projects identified to support the selected alternative. The delivery analysis will consider project grouping and potential delivery methods to meet regulatory, financial, and organizational constraints.
- Using updated flow and loading estimates, IPDES permit renewal conditions, and capacity assessment, prepare a CIP for the Meridian WRRF. This CIP will include planning-level (AACE Class 5) cost estimates for projects and an estimated project initiation date.
- Evaluate replacement schedule for major equipment and parts, based on equipment age and/or condition. This replacement schedule will include biotower media, new tertiary filter membranes, solids handling equipment, and any other critical equipment with high maintenance costs that would be incurred in the analysis period.

Deliverables.

- Report chapter to be incorporated into the Facility Plan Report.

2.8 Facility Plan Development

Objective. Prepare a comprehensive facilities plan document that summarizes the findings from the above tasks and provides a clear framework for improvements to the Meridian WRRF.

Approach. Major activities include the following:

- Summarize activities from Subtask 1 through Subtask 7, including a comprehensive CIP that will include costs and schedule for improvements, in a draft Facility Plan. It is assumed that the draft Facility Plan will require the synthesis of information from

the previous tasks for presentation to the IDEQ. The Facility Plan will be reviewed by a senior reviewer prior to being submitted to the City.

- Prepare a final Facility Plan that provides a clear action plan for WRRF Upgrades.
- Prepare for and lead up to two meetings with the City and the IDEQ to discuss the findings of the Facility Plan and the City's intended action plan for expansion. It is assumed that two members of BC team will attend each of these two-hour meetings.

Deliverables.

- Agenda and meeting materials for up to two meetings with the IDEQ to discuss the findings of the Facility Plan.
- Draft Meridian Facilities Plan to be submitted electronically to the City for one round of review and comment.
- Final Draft Meridian Facilities Plan to be submitted electronically to the IDEQ for one round of review and comment.
- Final version of Meridian Facilities Plan to be submitted in electronic and hardcopy format to the City and the IDEQ.

ASSUMPTIONS

- Note that work scope is conceptual in nature, based on limited information, and should only be relied upon for general planning purposes.
- Consultant will rely upon, without independent information, information from third parties, including available information related to reports related to key plant processes.
- It is assumed that the facility will not change process configurations for liquids or solids stream treatment, though process or energy performance enhancement may be achieved with upgrades as described in Task 2 Subtask 5.
- Recommendations and potential energy savings are based upon many data points and assumptions. Many of these variables are affected by the influent characteristics, costs of electricity and natural gas, planning level construction estimates, and O&M costs. Final results will depend on the variables which should be considered and reconfirmed as part of any preliminary design of potential improvements.
- The evaluation will rely on the accuracy of record drawings and historical records provided by the City. If drawings, data, or historical records are deemed to inaccurate, additional field effort may be required. BC will alert the City if expanded field effort is required over what was anticipated at the time the scope was prepared.
- For the wastewater characterization, the City will either conduct laboratory analyses in house or will contract directly with a send-out laboratory to conduct analyses. Shipping and analytical costs are not included in this scope of work. City staff will conduct sampling and preserve, store, organize, and assemble samples for shipping and/or analyses.
- Estimates of digester gas production, variability, and quality design criteria will be based upon current digester gas production rates reported by the City relative to volatile solids reduction (VSR), variability in gas production reported by the City and any gas quality data provided by the City. Should information from the City be

unavailable, typical design values will be used. Final results will depend on the quality and quantity of the data available from the City, and should be reconfirmed as part of any preliminary design of potential improvements.

- Any permits (including air) and associated support beyond those identified may be considered as additional services.
- The opinions of probable construction costs will be prepared to industry standards but will be subject to many influences including, but not limited to, price of labor and materials, schedule impacts, unknown or latent conditions of existing equipment or structures, and time or quality of performance by others. These types of issues are difficult to forecast and are out of the control of BC and that actual costs may vary substantially from the estimates prepared by BC. BC is therefore unable to guarantee the accuracy of opinion of probable construction costs beyond that of industry standards.
- The City will make available in a timely manner all drawings, records and site information obtained relative to the project, including topographical survey, and information related to any and all underground utilities, hazardous materials, easements, permits, geotechnical investigations, lab data, environmental surveys, etc. as necessary for completion of the work under the above detailed scope.
- The site does not have any environmental related concerns including contaminated soil, endangered species, etc. that would impact alternatives implementation or associated cost estimates. Environmental studies, including Phase 1 surveys or any other type of study/survey are not included as part of this project scope. If any regulatory agencies require additional studies be performed, they can be added as additional services, but may impact the overall project schedule.
- The initial effort is limited to the cost identified in the attached fee estimate. If the effort to complete the identified tasks exceeds the estimate, the PM will coordinate with the City to identify areas we can limit our effort to the available budget.
- Recommendations for future improvements that relate to specific nutrient reductions or other regulated requirements will be based upon our current understanding of requirements for future permits as provided by the City of Meridian.

KEY PERSONNEL

Dan Berthe
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Zach Dobroth
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(208) 389-7728

Rick Kelly
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(206) 749-2327

Dan Berthe will perform the administrative function including all program, policy, and contractual issues. Dan Berthe and Zach Dobroth will be responsible for coordination during the study phase and oversee all technical and project management activities associated with the task order scope of work. Rick Kelly will provide technical oversight and overall QA/QC.

TIME OF COMPLETION and COMPENSATION SCHEDULE

COMPENSATION AND COMPLETION SCHEDULE			
Task	**Description**	**Estimated Completion Date**	**Compensation**
1	Project Management	▪ February 27, 2024	$96,870
1.1	Project Management Activities	▪	
1.2	City Workshops	▪	
1.3	QA/QC	▪	
2	Facility Plan	▪ February 27, 2024	$394,053
2.1	Investigate Existing Wastewater System Conditions *draft chapter*	▪ February 10, 2023	
2.2	Subtask 2 – Wastewater Characterization *draft chapter*	▪ March 27, 2023	
2.3	Subtask 3 – Capacity Assessment Update *draft chapter*	▪ June 26, 2023	
2.4	Subtask 4 – Planning Criteria *draft chapter*	▪ February 17, 2023	
2.5	Subtask 5 – Liquid and Solids Treatment Analysis *draft chapter*	▪ August 1, 2023	
2.6	Subtask 6 – Other Related Evaluations *draft chapter*	▪ April 24, 2023	
2.7	Subtask 7 – CIP *draft chapter*	▪ August 29, 2023	
2.8	Subtask 8 – Facility Plan *draft report*	▪ January 16, 2024	
	Facility Plan *final report*	▪ February 27, 2024	
			TASK ORDER TOTAL: $490,923

The Not-To-Exceed amount to complete all services listed above for this Task Order is (four hundred ninety thousand nine hundred and twenty-three dollars) ($490,923). No compensation will be paid over the Not-to-Exceed amount without prior written approval by the City in the form of a Change Order. No travel or expenses will be reimbursed through this agreement. All costs must be incorporated in the individual tasks within the Compensation and Completion Schedule above.

CITY OF MERIDIAN

By:_____

KEITH WATTS, Procurement Manager

Dated:_____

Approved by City Council: _____

BROWN AND CALDWELL, INC.

By:_____

MARTHA KNOWLTON, Vice President

Dated: 1/20/23

City Project Manager:
Tyson Glock