TASK ORDER NO. 17

TO MASTER SERVICES AGREEMENT

BETWEEN CITY OF BRYANT, ARKANSAS AND CRIST ENGINEERS, INC.

This is Task Order No. 17 dated _____ _____, 2023, attached to and made part of the Master Services Agreement dated April 5, 2019, between CITY OF BRYANT, ARKANSAS (OWNER) and CRIST ENGINEERS, INC. (ENGINEER).

This Task Order describes the Scope of Services, Charges, and Payment Conditions for the Task Order 17 known as: **WASTEWATER SYSTEM MASTERPLAN** (the "Project"). The term ENGINEER is defined as the Company or Engineer of Record.

1. Scope of Services

A System Evaluation and Capacity Assurance Plan (SECAP) was completed for the City of Bryant in September of 2017. Concluding the SECAP effort a Capital Improvement Plan (CIP) was submitted and approved by the Arkansas Department of Environmental Quality (ADEQ) as required by Consent Administrative Order (CAO) LIS 15-057. The CIP outlined a sanitary sewer evaluation study be conducted in phases by drainage basins within the City of Bryant. Prior to the SECAP, the subsequent Wastewater Masterplan was completed in 2008.

The scope of work identified in this Task Order is to conduct Wastewater System Masterplan that will incorporate all improvements completed by the City since 2008, which include capital projects required of CAO LIS 15-057, as well as developments that occurred during 2015 to 2022, post SECAP hydraulic model development that was completed in September 2017. CAO LIS 15-057 required post system flow monitoring and modeling to demonstrate wet weather reduction of sanitary sewer overflows (SSO's) to be able to terminate CAO LIS 15-057.

The wastewater treatment facility will be incorporated into the hydraulic system model in regards with equalization basin operation during we weather events and peak hydraulic system constraints through the 2-year design storm event.

The effort will document and update service boundaries with a focus on potential residential, commercial, and industrial development to ascertain capital projects necessary to support wastewater service for the City of Bryant for a planning horizon of 5, 10, 15, and 20 years.

A biological system model will be developed of the wastewater treatment plant and deficiencies and improvements will be identified through the horizon period.

The objective is to develop a series of Technical Memoranda whereby establishing an updated Master Plan that includes a Capital Improvement Plan at the planning horizons.

The scope of work is further defined below:

The ENGINEER will provide for OWNER the following specific services for this task order:

1.1 Technical Memorandum 01 – Project Objectives and Goals

Objective: To ascertain OWNER stakeholder expectation of Wastewater System Master Plan and PROJECT success.

Subtasks:

1. The ENGINEER will plan, schedule and convene a PROJECT kick-off meeting/workshop. The purpose of the workshop and its planning is to:
   a. Establish PROJECT stakeholder list;
   b. Solicit stakeholder participation in the PROJECT;
   c. Establish PROJECT outcomes that will assist the PROJECT in becoming a success in the minds of all stakeholders;
   d. Establish stakeholder expectation as to what the PROJECT is about (contracted scope or otherwise) and;
   e. Develop a PROJECT work plan that outlines the objectives of the PROJECT, team members, schedule, and contract.
2. Prior to the kickoff meeting, the ENGINEER will meet with OWNER to plan the agenda of the workshop and develop the initial list of PROJECT stakeholders that should attend.
3. It is anticipated that the kickoff meeting can be convened on-site as it could be coupled with an initial site overview tour that will acquaint PROJECT team members with the physical specifics of the PROJECT.
4. ENGINEER will prepare meeting minutes of the workshop and distribute to all participants.
5. The ENGINEER will document the above work on this Task in a Technical Memorandum (TM) entitled, PROJECT Objectives and Goals.

Deliverables:

1. Workshop minutes containing OWNER stakeholder's expectations of PROJECT success and action plan that will assist the team in meeting the expectation.
2. Draft TM – PROJECT Objectives and Goals – PDF Only
3. Final TM – PROJECT Objectives and Goals – PDF + 3 Originals

1.2 Technical Memorandum 02 – Initial Planning and Evaluation Criteria

Objective: Understanding that the development of a Master Plan and CIP is a dynamic process, it is critical to develop initial criteria related to service area, planning period, flows, loadings, capacities, and other identified critical parameters. This information will

be continually updated throughout the PROJECT.

Subtasks:

1. Review of 2008 Masterplan to evaluate original assumptions and results for accuracy.
2. Update projected population estimates based on census and readily available planning documents.
3. Review existing permits, discharge monitoring reports, process characterization/ constituent information, reports of sanitary sewer overflows and other pertinent data to establish the initial criteria to evaluate alternatives and improvement considerations.
    a. Review existing population, flow and loading projections.
        i. Modify existing flow and loading projections as necessary.
4. Coordinate with the Department of Environmental Quality (ADEQ) a division of the Arkansas Department of Energy and Environment to identify potential future permitting requirements for existing NPDES Discharge Permits.
5. Interview OWNER personnel on issues and areas of concern.
6. Updated system planning area and updated planning and zoning areas to determine development densities over the planning period for 5, 10, and 20 year planning horizons.
7. Acquire all updated mapping of collection system projects and/or collection system updates
8. Acquire updated mapping of pump stations and force mains.
9. Identify parameters or areas in need of additional field work (testing, sampling and/or data collection).
    a. Develop sampling and testing plan with OWNER input (duration, frequency, and parameters) for the WWTPs and biosolids management process.
    b. Coordinate with competent laboratories to receive proposals for the testing of recommended constituents.
10. Prior to the update meetings, the ENGINEER will meet with OWNER to plan the agenda.
11. When necessary, conduct an onsite meeting to review the criteria as information becomes available.
12. ENGINEER will prepare meeting minutes of the workshop and distribute to all participants.
13. The ENGINEER will document the above work on this Task in a preliminary TM entitled, Initial Planning and Evaluation Criteria.
14. The preliminary TM will be updated as information becomes available throughout the PROJECT.

Deliverables:

1. Meeting minutes.

2. Draft wastewater system planning map.
    a. WWTP planning map.
    b. Critical lift station planning map.
3. Draft sampling and testing criteria.
4. Draft TM – Initial Planning and Evaluation Criteria - PDF
5. Final TM - Initial Planning and Evaluation Criteria – PDF + 3 Originals

1.3 Technical Memorandum 03: System Wide Hydraulic Model Update

Objective: A SECAP update on projects from the 2017 SECAP prepared by RJN Group, Inc. dated September 11, 2017. This report identified necessary collection system projects to comply with CAO LIS 15-057 through the development of a Capital Improvement Plan (CIP). This effort was based upon a flow monitoring and wastewater system hydraulic model effort developed in 2016 and 2017. Through this effort a hydraulic model was developed to aid in the determination of necessary projects for the reduction of sanitary sewer wet weather overflows. Since 2015 there have been several collection system projects completed. Collectively, these improvements have reduced the frequency of wet-weather sanitary sewer overflows (SSO's). The 2017 hydraulic model utilized to develop capital projects for SSO reduction is no longer reflective of current system flows or current system operation. It is typical of most communities to update system hydraulic models in 5-to-10-year increments to adequately reflect current system operation, whereby continued improvements necessary to reduce SSO's are adequately reflected. The purpose of this effort is to undergo new flow monitoring efforts to update the hydraulic model for it to be utilized for future capital improvement projects and demonstration of the current wet-weather management strategy to terminate the CAO. The recommended projects will be incorporated into an updated CIP.

Subtasks:

1. Hydraulic Model Update: The existing InfoWorks ICM hydraulic model currently contains a hydraulic network for all gravity line sewers, major pump stations and force mains within the OWNER's collection system up to the period of 2017. The 2017 SECAP model includes works that were projected to be completed as part of the SECAP. In addition, by updating the existing 2017 model, with the "scenario" functionality in InfoWorks ICM, a related network will be developed that incorporates the outstanding SECAP works. The 2017 model will be overlaid onto the latest GIS sewer data and any new sewers (gravity and pressure) will be added to the model.
    a. The model will also be supplemented with data from as built drawings from recently completed capital projects. A limited number of manhole surveys may also be undertaken to collect information at key assets.

b. All new data added into the hydraulic model network will be flagged to define its data source. In addition to new infrastructure, areas of new development will also be added to the model.
c. Using a combination of customer water billing data, property parcel shapefiles and recent aerial photography, additional properties will be added to capture areas of development which were not present in 2015. A separate version of the model shall be maintained that has all updates provided to the ENGINEER by the OWNER. It is anticipated that the OWNER shall provide these updates within schedule. The updated base network will then be incorporated into the SECAP network and tested to ensure that the SECAP network is progressively updated in parallel. The WWTP peak wet weather operating protocol will be incorporated into the model inclusive of the flow equalization basin located at the WWTP.

2. Update Model Population: The model represents all City parcels as subcatchments that contribute dry- and wet-weather flow into the wastewater collection system. All subcatchments include a population that in turn is multiplied by a loading rate (i.e. 70 gallons per person per day) and creates an initial residential base wastewater flow in the system. The population in the model will be updated to reflect the most recent Census data (2020 Census).
3. Update Model with Water Billing Records: The dry weather flow component will be updated in the model for all customers connected to the sewerage network. For residential customers this will be achieved using population data from the US Census and an initial per capita sewage loading of 70 gallons per person per day. For non-residential customers, the sewage loading will be modelled based on factored water usage. Using water billing data from the last year of records, to be provided by the OWNER, an average daily water usage will be calculated for all non-residential customers. An initial sewer discharge volume will then be applied to the model using a return to sewer rate of 90% of the average daily usage value. The diurnal flow pattern will be applied based on the customer's development type e.g., commercial, industrial, schools, retail etc.
4. Model Recalibration: Since several capacity improvements, lift station upgrades, and construction projects are to be commissioned in the future, it is prudent to confirm the flows that will be routed through the entire system to confirm all improvement efforts will have the desired effect as intended in the 2017 SECAP. Accurate recalibration of the sanitary sewer system will require methodical flow monitoring. Dry-weather calibration ideally requires at least a 7-day period, including one weekend, unaffected by rainfall induced flows. The flow survey data will be assessed in conjunction with the rainfall data, to select a representative dry-weather period. Wet-weather calibration is the process by which the recorded rainfall is applied to the model, and hydrological parameters are adjusted until a suitable match is achieved between observed and modeled flows. This includes simulating the entire flow monitoring period and checking that the "tails" of the

storm events are correctly replicated by the model as much as simulating the peak-wet weather flow. Detailed steps to achieve a dry-and weather calibration are as follows:

a. Select the most suitable dry weather period from the collected flow data.
b. Using the residential and non-residential DWF profiles as a base set, develop additional dimensionless dry weather flow profiles as required.
c. Through an iterative process of modifying per capita flow rates, modifying dimensionless profiles and application of permanent infiltration, calibrate model to dry weather weekday and weekend conditions.
d. Calibrate the model for wet weather over the flow survey period using the hydrology method that best suits the observed flow data based on engineering experience.
e. The model will be calibrated to industry standards by iteratively adjusting the wet-weather parameters until the model reasonably matches the depth, velocity, and flow recorded by the flow meters. Where suitable, SCADA data from lift stations will also be used as an additional validation source during this process.
f. The model will be calibrated by iteratively adjusting both the fixed and GIM parameters in the model until the model reasonably matches the depth, velocity, and flow recorded by the flow meters. Where the model data cannot be adjusted within acceptable parameters to match monitored conditions, the City will be consulted and field investigations may be performed to evaluate actual system performance.

5. Flow Monitoring: Include seven (7) flow monitors and zero (0) rain gauges to be installed, serviced, and calibrated by ENGINEER with approval of an amendment by OWNER to recalibrate the model's flows throughout the entire sewer system. Sixty (60) days of monitoring is anticipated. The locations of the flow monitors and rain gauges will align with that of the 2017 SECAP to correlate I/I reduction to demonstrate and reduced wet weather impact as required of the CAO.
    a. Review the collection system maps, operational information for the collection system to validate installation locations.
    b. Notify owner of any proposed changes from the SECAP 2017 locations.
6. Meter Maintenance:
    a. Service visits shall be performed on a bi-weekly basis to include in-situ depth and velocity confirmations, downloading recorded data, onsite analysis of the data, cleaning of the sensors, and replacing any defective or deficient equipment. Additional service visits may be scheduled as appropriate to meet adequate up-time.
    b. Flow, velocity, and depth data shall be evaluated from the office on a weekly basis. Data shall be reviewed within 24 hours of collection and field technicians will be dispatched within 48 hours to correct any issues identified.
7. Rain Gauge Installation:

a. Not Used

8. Rain Gauge Maintenance:
    a. Not Used
9. Flow Data Review and Analysis:
    a. Edit raw data and develop final calibrated flow data for flow meters.
    b. Develop depth, velocity, and quantity hydrographs for dry and wet weather flow conditions.
    c. Analyze flow data for sub-drainage basins and develop average daily dry weather flow diurnal curves and base flow peaking factors.
10. Collection System Alternative Evaluation:
    a. Concluding the hydraulic calibration model effort depicted above, the ENGINEER will develop scenarios (project options) to convey existing flows and future flows at the planning horizons specifically to address capacity and abate wet weather sanitary sewer overflows (SSO's) in the collection system to include but not necessarily limited to: 1) location and extension of new mains, 2) Parallel force main(s); 2) Upsizing (pipe bursting) existing mains, 3) Upgrade/modifications to the critical pump stations 4) stand-alone wet weather pump station; 4) Flow equalization facility(s) 5) Future WWTP location(s) 6) Regional Pump Stations. Future WWTP biological and hydraulic evaluation conducted under *Technical Memorandum: WWTP Biological and Hydraulic Capacity* will be referenced for the planning horizon collection system capacities.
    b. The existing and future planning horizons will include schematic level effort to include the following:
        i. Provide one-line process flow diagram of operation.
        ii. Provide a system description of operation
        iii. Identification of property acquisition, if necessary.
        iv. Develop a planning level (order of magnitude) estimates of probable construction cost equivalent to AACE Class 3 estimate for budget authorization.
        v. Prepare a decision assistant tool that identifies cost, regulatory requirements, strengths, weaknesses, and reliability.
        vi. ENGINEER will conduct a workshop with the OWNER to review the horizon planning periods and entertain comments and direction.

Deliverables:

1. Meeting minutes.
2. A Draft TM will be prepared in MS WORD with associated supporting exhibits in MS EXCEL, MS POWERPOINT or AutoCAD that document the work conducted. The TM will describe the scope of work, findings, and recommendations. Estimate of probable construction costs on the recommendation inclusive of workshop

comments will be provided.

3. Provide a presentation of the TM to OWNER's staff of the TM findings.
4. ENGINEER will incorporate OWNER'S comments and finalize the TM.
    a. Draft TM – System Wide Hydraulic Model Update with Recalibration - PDF
    b. FINAL TM – System Wide Hydraulic Model Update with Recalibration – PDF + 3 Originals

1.4 Technical Memorandum 04: WWTP Biological and Hydraulic Evaluation

Objective: ENGINEER will complete a biological and hydraulic model to assist with the evaluation of existing and future treatment capacities of the WWTP; identify process bottlenecks and modifications; assess potential innovative treatment technologies for the development of CIPs. ENGINEER will use EnviroSim Associates, Ltd. BioWin for the biological modeling. ENGINEER will use Visual Hydraulics for the hydraulic modeling. BioWin and Visual Hydraulics are industry-accepted models for analysis and modeling of wastewater treatment plants. The recommended projects will be incorporated into a capital improvement plan.

Subtasks:

1. Review existing reports and data to establish the initial criteria and develop statistical criteria to be used for scenario development.
2. ENGINEER will further define the goal of the biological and hydraulic model with OWNER stakeholders during the first phase of the modeling effort. During the site visit, ENGINEER will review the plant operation, including recycle stream returns, sampling procedures, solids processing etc. Information collected during the site visit will be used during modeling to represent the plant processes more accurately.
3. Engage ADEQ to establish preliminary discharge characterization for alternative outfall location(s) to Hurricane Creek area to provide relief on NPDES discharge parameters and / or whole effluent toxicity testing and establish anticipatory regulations changes to the receiving stream.
4. Identify parameters or areas in need of additional field work (testing, sampling and/ or data collection). Initial parameters were identified with the Project Objectives and Goals and Initial Planning and Evaluation Criteria Technical Memorandum.
5. Data collection and conditioning will be performed before configuration and calibration. However, during configuration or calibration additional data needs not initially anticipated might be discovered, and therefore an additional minor sampling program may be required.
6. Unit process definition/ use and connectivity (between unit processes) will be determined. The hydraulic and biological model configurations will reasonably represent field conditions based on the best available information and engineering judgement.

7. The biological model will be calibrated based on best available information. Calibration generally includes running steady-state simulations repeatedly to compare observed (or field) with predicted (or model) results. ENGINEER will modify model parameters using engineering judgement to obtain close agreement between predicted and observed values.
8. The hydraulic and biological models will then use a two-point validation using calibrated simulations (dry and wet weather conditions) with data different than those used during calibration to assess the match between predicted and observed model values.
9. The calibrated and validated biological model will then be used to evaluate two (2) process train scheme alternatives. These alternatives include biological, chemical, and physical removal technologies. The alternatives analysis will identify the feasibility of implementing each alternative will help to identify the most effective treatment alternative.
10. The hydraulic models will be calibrated for two (2) wet weather conditions (two-point calibration). The biological model will be calibrated for four (4) dry weather conditions (two-point calibration at low influent temperature and warm influent temperature). Calibration includes running steady-state simulations repeatedly to compare observed (or field) with predicted (or model) results. ENGINEER will modify model parameters using engineering judgement to obtain close agreement between predicted and observed values.
11. The calibrated and validated biological model will then be used to evaluate three (3) process train alternatives that will include consideration for increased flows at the planning horizons. These alternatives include biological, chemical, and physical removal technologies. The alternatives analysis will identify the feasibility of implementing each alternative and will help to identify the most effective treatment alternative. The results of the alternative analysis will be reported in the TM. Process train alternatives will include:
    a. Conceptual site layouts.
    b. Conceptual capital and present worth planning estimates.
    c. Review existing energy consumption related to alternatives.
    d. Develop solutions that minimize energy consumption.
    e. Decision matrix.
12. Conduct one (1) preliminary onsite workshop with OWNER staff to collectively develop process train alternatives.
13. Conduct one (1) update onsite workshop with OWNER staff discussing modeling alternative results, capital and present worth costs estimates to collectively select a preferred process train alternative.
14. Conduct hydraulic modeling on selected biological modeling alternative.
15. The calibrated and validated hydraulic model will then be used to evaluate the selected biological model alternative at the selected hydraulic scenario.

16. Solids waste to the existing dewatering process will be validated to continue land surface disposal.
    a. Centrifuge run times and system capacity will be validated.
17. The technical memorandum will include the following:
    a. Simulation objective.
    b. Data sources.
    c. Software and version used.
    d. Simulation overview.
    e. Simulator files.
    f. Screen shots.
    g. Influent and effluent criteria.
    h. Kinetic and stoichiometric parameters.
    i. Model configurations.
    j. Operational parameters.
    k. Model calibrations.
    l. Model validations.
    m. Model results.
    n. Process train alternatives
    o. Evaluate opportunity for alternative disinfection
        i. UV
        ii. Peracetic Acid
    p. Conceptual site layouts
    q. Develop a planning level (order of magnitude) estimates of probable construction cost equivalent to AACE Class 3 estimate for budget authorization.
    r. Decision matrix.
    s. Identify selected process train alternative.
    t. Preliminary site layout and costs.

<u>Deliverables:</u>

1. Meeting minutes.
2. A Draft TM will be prepared in MS WORD with associated supporting exhibits in MS EXCEL, MS POWERPOINT or AutoCAD that document the work conducted. The TM will describe the scope of work, findings, and recommendations. Estimate of probable construction costs on the recommendation inclusive of workshop comments will be provided.
3. Provide a presentation of the TM to OWNER's staff of the TM findings.
4. ENGINEER will incorporate OWNER'S comments and finalize the TM.
    a. Draft TM – WWTP Biological and Hydraulic Evaluation - PDF
    b. Final TM - WWTP Biological and Hydraulic Evaluation – PDF + 3 Originals

1.5 Technical Memorandum 05: WWTP Unit Process Evaluation

Objective: To ascertain the level of reliability, functionality, and potential of meeting future biological and/or hydraulic capacity of major unit process equipment at the WWTP

Subtasks:

1. Review existing unit process equipment for reliability, condition, and operation.
    a. Conduct OWNER staff interviews.
    b. Compare unit process components criteria to design and construction standards of regulating authority and/ or industry practice.
    c. Site visual observations only.
    d. Identify areas with corrosion.
    e. Develop corrosion control alternatives for areas identified.
    f. The following parameters to be reported:
    g. Installation Year.
    h. Condition of Existing Equipment.
    i. Performance History.
    j. Maintenance Work Order History.
    k. Operation Issues.
    l. Biological Capacity.
    m. Hydraulic Capacity.
    n. Flow and Loading Projection.
    o. Major Equipment Rehabilitation History.
2. The information will be compiled and summarized in a tabular format to develop a ranking system with OWNER stakeholders.

Deliverables:

1. Meeting minutes.
2. A Draft TM will be prepared in MS WORD with associated supporting exhibits in MS EXCEL, MS POWERPOINT or AutoCAD that document the work conducted. The TM will describe the scope of work, findings, and recommendations. Estimate of probable construction costs on the recommendation inclusive of workshop comments will be provided.
3. Provide a presentation of the TM to OWNER's staff of the TM findings.
4. ENGINEER will incorporate OWNER'S comments and finalize the TM.
    a. Draft TM – WWTP Unit Process Evaluation - PDF
    b. Final TM - WWTP Unit Process Evaluation – PDF + 3 Originals

1.6 Technical Memorandum 06 – Major Lift Stations and Force Mains

Objective: Assessment and evaluation of 40 lift stations and associated force mains. ENGINEER will interview the OWNER to determine issues for each pump station and force main to determine up to 8 lift stations and associated force mains for further evaluation based upon the interviews further depicted in the subtask below.

Subtasks:

1. Review existing reports and data
2. Review hydraulic modeling results related to current and projected flows system wide hydraulic update.
3. The scope of work will include:
    a. Review of pump capacity, reliability, and performance
    b. Review run-time hours for each pump
    c. Conduct and assessment of support appurtenances, isolation valves, check valves, gauges, electrical, control systems.
    d. Validate generator sizing and confirm operation
    e. Document potential corrosion and structural issues present from surface inspection.
    f. Utilize downhole remote camera monitoring equipment to visually inspect wetwell.
    g. Document work order frequency for pump station and force mains
    h. Document code deficiencies.
    i. Identify the presence of excessive sulfides
    j. Force main repair records will be documented and mapped to locate criticality failures.
        i. No internal or external inspections will be performed.
    k. Evaluate the ability of the pump station and force main system to sustain peak wet weather flow projections at each planning horizon.
    l. Identify critical infrastructure and incorporate a risk profile in event of the asset failure.
    m. Compile a ranking and decision matrix.
    n. Recommend odor control technologies available to abate odorous and corrosive conditions.
    o. Develop capital improvement costs for each pump station and force main evaluated.
4. Conduct a workshop to present the initial findings to the OWNER.

Deliverables:

1. Meeting minutes.

2. A Draft TM will be prepared in MS WORD with associated supporting exhibits in MS EXCEL, MS POWERPOINT or AutoCAD that document the work conducted. The TM will describe the scope of work, findings, and recommendations. Estimate of probable construction costs on the recommendation inclusive of workshop comments will be provided.
3. Provide a presentation of the TM to OWNER's staff of the TM findings.
4. ENGINEER will incorporate OWNER'S comments and finalize the TM.
    a. Draft TM – Major Lift Station and Force Mains - PDF
    b. Final TM – Major Lift Stations and Force Mains - PDF + 3 Originals

1.7 Technical Memorandum 07- Biosolids Stabilization and Management:

Objective: Evaluate current biosolids stabilization technique, biosolids thickening and decanting, and biosolids production to evaluate the ability to produce a Class B or Class A product for final disposal.

Subtasks:

1. ENGINEER will develop a base line cost of current sludge processing, dewatering and disposal methodology.
2. ENGINEER will develop short term improvement alternatives for initial 5, 10 and 20-year period:
    a. Class A/Class B Treatment Improvements
        i. Evaluate improvements necessary to achieve Class B biosolids by utilizing aerobic digestion.
        ii. Evaluate improvements necessary to achieve a Class A biosolid by utilizing alkaline stabilization technology.
        iii. Conduct a survey of available lands amenable for land application of Class B and/or Class A biosolids within a 30-mile radius of the facility for the deposition of dewatered biosolids or liquid biosolids.
    b. Evaluate alternative landfill sites for deposition of biosolids

Deliverables:

1. Meeting minutes.
2. A Draft TM will be prepared in MS WORD with associated supporting exhibits in MS EXCEL, MS POWERPOINT or AutoCAD that document the work conducted. The TM will describe the scope of work, findings, and recommendations. Estimate of probable construction costs on the recommendation inclusive of workshop comments will be provided.
3. Provide a presentation of the TM to OWNER's staff of the TM findings.

4. ENGINEER will incorporate OWNER'S comments and finalize the TM.
    a. Draft TM – Biosolids Stabilization and Management – PDF
    b. Final TM – Biosolids Stabilization and Management - PDF + 3 Originals

1.8 Technical Memorandum 08: SCADA Evaluation

Objective: Evaluate the existing Supervisory Control and Data Acquisition (SCADA) system to ascertain necessary hardware and software modifications to monitor and control up to 40 pump stations and the wastewater treatment facility.

Subtasks:

1. Interview OWNER staff to discuss SCADA function and need.
2. Site investigation of remote sites
    a. Document existing hardware condition (quality/obsolescence)
    b. Document communication methods and condition
    c. Develop a sample I/O list form each site
3. Establish a base line evaluation of the existing SCADA system that currently operates on PumpView 3 a Xylem product (Multi-trode).
    a. Investigation of existing functionality
        i. Document the remote sites currently functional
        ii. Document web browser interface functionality
            1) Develop list of screens and control & monitoring tags
            2) Reporting and alarming
4. Site investigation of WWTP
    a. Document existing equipment available to be incorporated into a plant wide SCADA system
5. Provide recommendation on SCADA improvements for Pump View 3 functionality.
6. Provide recommendation of alternative software and hardware components to improve functionality, data acquisition, and report features.

Deliverables:

1. Meeting minutes.
2. A Draft TM will be prepared in MS WORD with associated supporting exhibits in MS EXCEL, MS POWERPOINT or AutoCAD that document the work conducted. The TM will describe the scope of work, findings, and recommendations. Estimate of

probable construction costs on the recommendation inclusive of workshop comments will be provided.

3. Provide a presentation of the TM to OWNER's staff of the TM findings.
4. ENGINEER will incorporate OWNER'S comments and finalize the TM.
5. Draft TM – SCADA Evaluation - PDF
6. Final TM - SCADA Evaluation - PDF + 3 Originals

1.9 Report: Wastewater Capital Improvement Plan

Objective: To prepare a single, combined Capital Improvement Plan (CIP) based upon the developed recommendations within the individual TMs and using a holistic decision approach to compare options, present sequencing, incorporate multiple objectives, and evaluate uncertainty. After the definition of the alternatives and the selection of the preferred CIP alternative, the CIP will show schematic design of the recommended improvements; refine the estimate of probable construction costs; and develop a holistic implementation plan based on the schematic design.

Subtasks:

1. Review developed TMs and selected recommendations.
2. Score project risk and uncertainty related to each individual CIP project.
3. Assign a score to each CIP project.
4. Review and re-visit capital planning costs.
5. Incorporate CIP's on each planning horizon.
6. Conduct one (1) preliminary onsite workshop with OWNER staff presenting the CIP Report.
7. Revise and restructure the CIP report based on OWNER staff comments.
8. Develop a CIP executive summary.
9. Present final report and findings to Bryant Water and Sewer Advisory Committee, Planning Commission, and City Council – a total of four meetings.

Deliverables:

1. A Draft CIP will be prepared in MS WORD with associated supporting exhibits in MS EXCEL, MS POWERPOINT or AutoCAD that document the work conducted. The TM will describe the scope of work, findings, and recommendations. Estimate of probable construction costs on the recommendation inclusive of workshop comments will be provided.
2. Provide a presentation of the TM to OWNER's staff of the TM findings.
3. ENGINEER will incorporate OWNER'S comments and finalize the TM.

a. Draft TM – Wastewater CIP – PDF
b. Present final report and findings to Bryant Water and Sewer Advisory Committee, Planning Commission, and City Council – a total of four meetings.
c. Final TM – Wastewater CIP - PDF + 3 Originals

2. Compensation and Invoicing

Compensation for Services of ENGINEER described in this Task Order will be on the following basis:

OWNER shall pay ENGINEER (Crist) a lump sum amount or unit cost as indicated in the schedule below to conduct the professional service identified herein which will be full compensation for all labor, expenses, and materials necessary to complete the work. The total amount for the work shall not exceed **$509,165.** Each Technical Memorandum below is shown as an estimate and the final schedule may vary.

Payment requests will be invoiced on a percent complete basis once per month and paid within 30 days.

Technical Memorandum 01 – Project Objectives and Goals:

Fee Structure: Lump Sum Amount: $13,500

Technical Memorandum 02 – Initial Planning and Evaluation Criteria

Fee Structure: Lump Sum Amount: $38,500

Technical Memorandum 03– System Wide Hydraulic Model Update:

Item	Quantity	Unit	Unit Cost	Total Cost
Task Administration	1	Lump Sum	$22,950.00	$22,950.00
Meter Investigations & Installation	7	Each	$1,295.00	$9,065.00
Rain Gauge Investigation & Installation	0	Each	$500.00	$0.00
Meter Maintenance	420	Man Day	$91.50	$38,430.00
Rain Gauge Maintenance	0	Man Day	$10.00	$0.00
Flow Monitoring Data Management	1	Lump Sum	$5,500.00	$5,500.00

Model Update	1	Lump Sum	$22,640.00	$22,640.00
Model Calibration	1	Lump Sum	$32,620.00	$32,620.00
System Analysis	1	Lump Sum	$24,900.00	$24,900.00
Technical Memorandum: System Wide Hydraulic Model Update	1	Lump Sum	$28,310.00	$28,310.00
Total:				**$ 184,415.00**

Technical Memorandum 04 – WWTP Biological and Hydraulic Evaluation

Fee Structure: Lump Sum Amount: $62,500

Technical Memorandum 05 - WWTP Unit Process Evaluation:

Fee Structure: Lump Sum Amount: $31,500

Technical Memorandum 06 – Major Lift Stations and Force Mains:

Fee Structure: Lump Sum Amount: $40,000

Technical Memorandum 07 – Biosolids Stabilization and Management:

Fee Structure: Lump Sum Amount: $42,750

Technical Memorandum 08 – SCADA Evaluation

Fee Structure: Lump Sum Amount: $42,500

Report: Wastewater Capital Improvement Plan

Fee Structure: Lump Sum Amount: $53,500

3. Schedule: See Exhibit A – Bryant Wastewater Masterplan Schedule

4. Exclusions

For this task order, it is hereby understood and agreed by the Parties hereto that the services of the ENGINEER do not include:

3.1 Engineering design / construction plan development (this service can be provided under a separate task order).

3.2 Construction observation and/or inspections (this service can be provided under a separate task order).

3.3 Laboratory testing of water or wastewater constituents necessary for the performance of the work.

3.4 Subsurface exploration or soil borings or their geotechnical considerations.

3.5 Testing of construction materials and/or methods and equipment.

3.6 Payment for the publication of legal notices as may be associated with the Project.

3.7 Payment for any services by legal counsel, bond counsel, fiscal agent, appraiser, or abstract company.

3.8 Any fees or taxes as may be charged by local, state, or federal regulatory agencies.

3.9 Any costs or fees associated with securing easements or land rights.

3.10 Any costs associated with environmental studies required to secure state or federal permits or licenses.

3.11 Payment of any fees or charges as may be assessed by Arkansas One Call for locating existing utilities.

5. Terms and Conditions

The terms and conditions of the Master Agreement referred to above shall apply to this Task Order except to the extent expressly modified herein. In the event of any such modification, the modification shall be set forth below and the Article of the Agreement to be modified shall be specifically referenced. Modifications included in this Task Order are:

None.

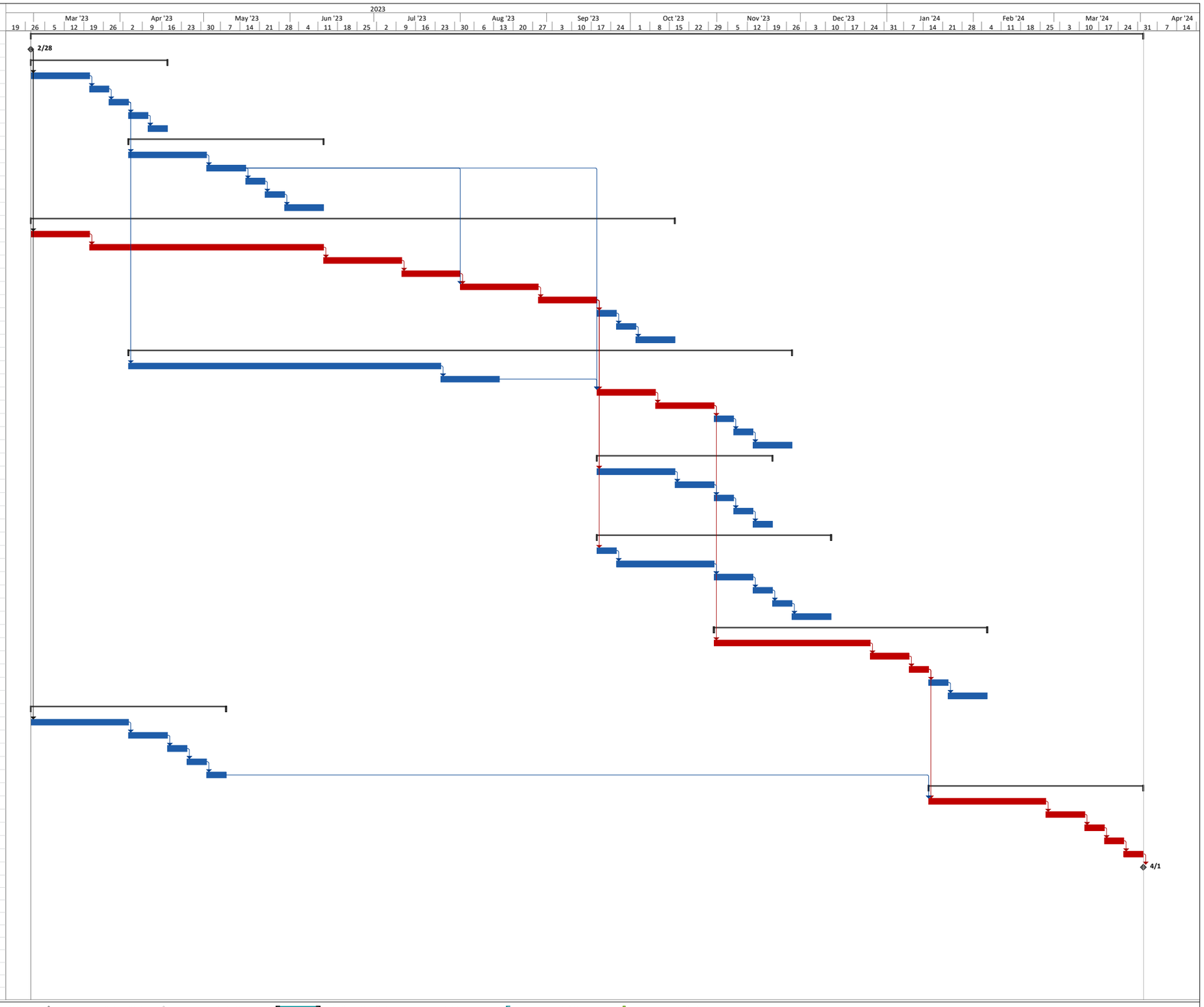
5. Terms or Provisions in Conflict

If the provisions set forth in the Agreement are in conflict with the provisions set forth in this Task Order, the provisions of this Task Order shall govern.

Acceptance of the terms of this Task Order is acknowledged by the following authorized signatures of the parties to the Agreement:

OWNER:	ENGINEER:
CITY OF BRYANT, ARKANSAS	CRIST ENGINEERS, INC.
_____(Signature)	_____(Signature)
By:_____(Print or Type)	By:_____(Print or Type)
Title:_____(Print or Type)	Title:_____(Print or Type)
Date:_____	Date:_____

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors
1		**Exhibit A: Bryant Wastewater Masterplan Schedule**	**57 wks**	**Tue 2/28/23**	**Mon 4/1/24**	
2		Project Notice to Proceed	0 wks	Tue 2/28/23	Tue 2/28/23	
3		**TM 01 - Project Objectives and Goals**	**7 wks**	**Tue 2/28/23**	**Mon 4/17/23**	
4		Project Objectives and Goals	3 wks	Tue 2/28/23	Mon 3/20/23	2
5		Draft TM	1 wk	Tue 3/21/23	Mon 3/27/23	4
6		Presentation	1 wk	Tue 3/28/23	Mon 4/3/23	5
7		Meeting Minutes	1 wk	Tue 4/4/23	Mon 4/10/23	6
8		Final TM	1 wk	Tue 4/11/23	Mon 4/17/23	7
9		**TM 02 - Initial Planning and Evaluation Criteria**	**10 wks**	**Tue 4/4/23**	**Mon 6/12/23**	
10		Initial Planning and Evaluation Criteria	4 wks	Tue 4/4/23	Mon 5/1/23	6
11		Draft TM	2 wks	Tue 5/2/23	Mon 5/15/23	10
12		Presentation	1 wk	Tue 5/16/23	Mon 5/22/23	11
13		Meeting Minutes	1 wk	Tue 5/23/23	Mon 5/29/23	12
14		Final TM	2 wks	Tue 5/30/23	Mon 6/12/23	13
15		**TM 03 - System Wide Hydraulic Model Update**	**33 wks**	**Tue 2/28/23**	**Mon 10/16/23**	
16		Meter and Rain Gauge Installation	3 wks	Tue 2/28/23	Mon 3/20/23	2
17		Monitoring Period	12 wks	Tue 3/21/23	Mon 6/12/23	16
18		Hydraulic Model Update	4 wks	Tue 6/13/23	Mon 7/10/23	17
19		Model Calibration	3 wks	Tue 7/11/23	Mon 7/31/23	18
20		System Analysis	4 wks	Tue 8/1/23	Mon 8/28/23	19,11
21		Draft TM	3 wks	Tue 8/29/23	Mon 9/18/23	20
22		Presentation	1 wk	Tue 9/19/23	Mon 9/25/23	21
23		Meeting Minutes	1 wk	Tue 9/26/23	Mon 10/2/23	22
24		Final TM	2 wks	Tue 10/3/23	Mon 10/16/23	23
25		**TM 04 - WWTP Biological and Hydraulic Evaluation**	**34 wks**	**Tue 4/4/23**	**Mon 11/27/23**	
26		Testing and Data Acquisition	16 wks	Tue 4/4/23	Mon 7/24/23	6
27		Initial Model Set-Up and Baseline Calibration	3 wks	Tue 7/25/23	Mon 8/14/23	26
28		Biological and Hydraulic Evaluation	3 wks	Tue 9/19/23	Mon 10/9/23	21,27,11
29		Draft TM	3 wks	Tue 10/10/23	Mon 10/30/23	28
30		Presentation	1 wk	Tue 10/31/23	Mon 11/6/23	29
31		Meeting Minutes	1 wk	Tue 11/7/23	Mon 11/13/23	30
32		Final TM	2 wks	Tue 11/14/23	Mon 11/27/23	31
33		**TM 05 - WWTP Unit Process Evaluation**	**9 wks**	**Tue 9/19/23**	**Mon 11/20/23**	
34		WWTP Unit Process Evaluation	4 wks	Tue 9/19/23	Mon 10/16/23	21
35		Draft TM	2 wks	Tue 10/17/23	Mon 10/30/23	34
36		Presentation	1 wk	Tue 10/31/23	Mon 11/6/23	35
37		Meeting Minutes	1 wk	Tue 11/7/23	Mon 11/13/23	36
38		Final TM	1 wk	Tue 11/14/23	Mon 11/20/23	37
39		**TM 06 - Major Lift Stations and Force Mains**	**12 wks**	**Tue 9/19/23**	**Mon 12/11/23**	
40		Intital Staff Review	1 wk	Tue 9/19/23	Mon 9/25/23	21
41		Major Lift Stations and Force Mains Evaluation	5 wks	Tue 9/26/23	Mon 10/30/23	40
42		Draft TM	2 wks	Tue 10/31/23	Mon 11/13/23	41
43		Presentation	1 wk	Tue 11/14/23	Mon 11/20/23	42
44		Meeting Minutes	1 wk	Tue 11/21/23	Mon 11/27/23	43
45		Final TM	2 wks	Tue 11/28/23	Mon 12/11/23	44
46		**TM 07 - Biosolids Stabilization and Management**	**14 wks**	**Tue 10/31/23**	**Mon 2/5/24**	
47		Biosolids Stabilization and Management	8 wks	Tue 10/31/23	Mon 12/25/23	29
48		Draft TM	2 wks	Tue 12/26/23	Mon 1/8/24	47
49		Presentation	1 wk	Tue 1/9/24	Mon 1/15/24	48
50		Meeting Minutes	1 wk	Tue 1/16/24	Mon 1/22/24	49
51		Final TM	2 wks	Tue 1/23/24	Mon 2/5/24	50
52		**TM 08 - SCADA Evaluation**	**10 wks**	**Tue 2/28/23**	**Mon 5/8/23**	
53		SCADA Evaluation	5 wks	Tue 2/28/23	Mon 4/3/23	2
54		Draft TM	2 wks	Tue 4/4/23	Mon 4/17/23	53
55		Presentation	1 wk	Tue 4/18/23	Mon 4/24/23	54
56		Meeting Minutes	1 wk	Tue 4/25/23	Mon 5/1/23	55
57		Final TM	1 wk	Tue 5/2/23	Mon 5/8/23	56
58		**Report - Wastewater Capital Improvement Plan**	**11 wks**	**Tue 1/16/24**	**Mon 4/1/24**	
59		Wastewater Capital Improvement Plan	6 wks	Tue 1/16/24	Mon 2/26/24	49,57
60		Draft TM	2 wks	Tue 2/27/24	Mon 3/11/24	59
61		Draft Report & Findings Meeting - Staff	1 wk	Tue 3/12/24	Mon 3/18/24	60
62		Final Report & Findings Meeting - Advisory Committee	1 wk	Tue 3/19/24	Mon 3/25/24	61
63		Final Report & Finding - Council	1 wk	Tue 3/26/24	Mon 4/1/24	62
64		Project Complete	0 wks	Mon 4/1/24	Mon 4/1/24	63
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Date: Wed 2/1/23

Task, Split, Milestone, Summary, Project Summary, External Tasks, External Milestone, Inactive Task, Inactive Milestone, Inactive Summary, Manual Task, Duration-only, Manual Summary Rollup, Manual Summary, Start-only, Finish-only, Deadline, Critical, Critical Split, Progress