

**Master City of San José Consultant Agreement
Amendment to Approved Service Order – RWF Capital Projects
Cover Page**

- 1a. CPMS Contract No.: 7995 1b. Master Agreement AC No.: 27585
2. First Second Third Fourth Amendment to Approved Service Order No. 7
3. Consultant's Name: AECOM Technical Services, Inc. ("Consultant")

Project Name: Primary Clarifiers and Primary Effluent Pump Station Condition Assessment Study ("Study")

Amendment Description: This Fourth Amendment to Service Order No. 7, reallocates costs within Task 5 (East Primary Clarifier Capacity Assessment), and extends the completion time of all tasks. There is no change to the total compensation.

4. The above-referenced Approved Service Order is amended as follows:

- a. **Budget/Fiscal:** The original Budget/Fiscal information in Section 7 of the Approved Service Order First Revised Budget/Fiscal Attachment Second Revised Budget/Fiscal Attachment Third Revised Budget/Fiscal Attachment is amended to read as set forth in the attached First Second Third Revised Budget/Fiscal Attachment Fourth Revised Budget/Fiscal Attachment.
- b. **Tasks – Attachment A:** The original First Revised Second Revised Third Revised Attachment A is amended to read as set forth in the attached First Second Third Fourth Revised Attachment A.
- c. **Terms and Conditions – Attachment B:** The original First Revised Second Revised Third Revised Attachment B is amended to read as set forth in the attached First Second Third Revised Attachment B Fourth Revised.
- d. **Compensation Table – Attachment C:** The original First Revised Second Revised Third Revised Attachment C is amended to read as set forth in the attached First Second Third Fourth Revised Attachment C.
5. Each of the attachments to this amendment is incorporated herein by reference and supersedes in its entirety any corresponding attachment to the original Approved Service Order and any amendments thereto.

6. Consultant Approval:

Craig J. Smith
Email: craig.j.smith@aecom.com
Date: 01/05/2023 GMT

Date: 01/05/2023

7. Approval as to Form (City Attorney):

- Approved Service Order Amendment Form Approved by the Office of the City Attorney**

(There are no material changes to the provisions of the Approved Service Order Amendment Form.)

- Approved as to Form:**

Assistant City Attorney:

Kevin Fisher
Email: kevin.fisher@sanjoseca.gov
Date: 01/05/2023 GMT

Date: 01/05/2023

8. City Director Approval:

Nappy Fukuda
Email: nappy.fukuda@sanjoseca.gov
Date: 01/05/2023 GMT

Date: 01/05/2023

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Approved as to Form:

Assistant City Attorney: *Kevin Fisher* Email: kevin.fisher@sanjoseca.gov
Date: 01/05/2023 GMT Date: 01/05/2023

8. City Director Approval: *Napp Fukuda* Email: napp.fukuda@sanjoseca.gov
Date: 01/05/2023 GMT Date: 01/05/2023

First Second Third **Fourth Revised Attachment A: Tasks**

This Revised Attachment A is attached to the First Second Third Fourth amendment to Approved Service Order No. 7 issued pursuant to the Master Agreement having the above-referenced CPMS Contract No.

The original Attachment A, including any exhibits thereto, is deleted in its entirety and replaced by the following:

General Description of Project for which Consultant will Provide Services:

The primary treatment process at the RWF consists of two (2) sets of primary clarifiers, namely the east and west primary clarifiers (“Primary Clarifiers”). The east primary clarifiers, built in the 1960s and 1970s, consist of two hydraulically similar batteries of nine primary tanks operating in parallel with a combined capacity of 330 million gallons per day. The west primary clarifiers, built in the mid-1950s, consist of eight tanks, of which two tanks are used for treating filter backwash water. These tanks have a combined capacity of 60-90 million gallons per day. The primary sludge from both clarifiers is removed using progressive cavity pumps.

The Primary Effluent Pump Station (“PEPS”) built in the mid-1980s, consists of four (4) vertical turbine variable speed pumps, each with a design capacity of 45 million gallons per day. The PEPS receives effluent from the Primary Clarifiers by gravity and pumps the wastewater to the Biological Nutrient Removal No. 2 treatment system. The PEPS also directs flow to the primary effluent equalization basin located across Zanker Road.

The purpose of this Service Order No. 7 (“SO”) is for the Consultant to evaluate the process, structural, mechanical, electrical, and instrumentation/controls components of the Primary Clarifiers and PEPS facilities. The condition assessment will be used to predict the remaining useful life of critical components in these facilities and identify capital assets in need of rehabilitation or replacement. The Consultant will develop a timeline of recommended repairs and/or replacements required to keep the Primary Clarifiers in operation up to the year 2051 and will prepare an opinion of probable construction cost (“OPCC”) and related operation and maintenance (“O&M”) costs for such work. The Consultant will assess the hydraulic capacity of the East Primary Clarifiers, prepare a conceptual construction sequencing plan for the Primary Clarifiers and the PEPS, and update related OPCCs. This conceptual construction sequencing plan and the OPCCs will be reviewed and amended if needed by the design engineer in a subsequent rehabilitation project.

This SO consists of the following tasks:

- Task No. 1: Project Management and Quality Assurance / Quality Control (“QA/QC”)
- Task No. 2: Background Review, CIP/O&M Interviews
- Task No. 3: Condition Assessment, Seismic Analysis and Estimate of Remaining Useful Life
- Task No. 4: Primary Clarifier and PEPS Improvements Conceptual Construction Sequencing
- Task No. 5: East Primary Clarifier Capacity Assessment

Task No. 1: Project Management and Quality Assurance / Quality Control (“QA/QC”)

- A. Services:** The Consultant’s Project Manager (“PM”) shall make staffing assignments, review work progress, coordinate quality management and review procedures, monitor budget and schedule, submit invoices, and communicate progress through monthly reports to the City.

The Consultant’s PM will actively manage the activities, communication and deliverables of the Consultant’s team members and sub-consultants to achieve completion of the scope of work within the established budget, schedule, and recognized industry standards.

The City’s PM for the Project will direct the Consultant in accordance with this Approved SO. All coordination between the Consultant and the City shall be via the designated City and Consultant PMs or their designees. The Consultant’s scope of work will be conducted by the Consultant unless otherwise approved by the City.

The City will provide Project templates and guidelines no later than ten (10) business days following the Notice to Proceed. The deliverables submitted by the Consultant will conform to the City’s templates and guidelines. The templates and guidelines to be provided by the City include the following:

- Meeting Agenda;
- Meeting Minutes;
- Project Decision Log (“PDL”);
- Project Work Plan (“PWP”);
- Quality Management Plan (“QMP”);
- Quality Management Letter template;
- Quality Review Form;
- Reviewer’s Comment Log;
- Cost Estimating Guidelines;
- Project Delivery Model (“PDM”);
- Technical Memoranda (“TM”);
- Technical Report; and
- CIP Design Guidelines.

Specific Project Management Activities under Task No. 1 include:

1. **Project Setup and Closeout:** Consultant shall complete all steps necessary to setup and closeout project both internally and externally. Project setup activities include executing the project agreement and adding the project into the Consultant’s financial and document management systems. Project closeout activities include final invoicing and documentation file transfer to the City.
2. **Weekly Tracking and Coordination:** Consultant will oversee daily management of scope, deliverables, schedule, and budget.
3. **Weekly Status Teleconferences:** Consultant will participate in weekly status teleconferences with the City’s PM to discuss overall work progress and status on near-term efforts and requirements. More or less frequent communication may occur if necessary, and as requested by the City’s PM.
4. **Project Work Plan:** Consultant shall prepare and submit a PWP detailing tasks to be performed, schedule, deliverables (including their requirements and resources), and a risk management plan. The PWP shall be a single deliverable with no monthly updates required.
5. **Project Decision Log:** Consultant shall prepare and maintain a PDL that documents the City’s comments and decisions made for work performed under this Project. As applicable, the PDL shall reference other documents such as meeting minutes, technical memoranda and reports

- for all decisions made. The PDL shall be updated monthly and submitted with the Monthly Progress Report.
6. **Project Schedule:** Consultant shall prepare a project schedule utilizing Critical Path Method techniques using an electronic scheduling software tool (Microsoft Project or Primavera). The schedule shall adopt a Work Breakdown Structure that reflects the project scope of work and shall use working days for activity durations, link activities with the appropriate logic (predecessors and successors), and include required schedule constraints, sequences, and milestones. The schedule shall show a baseline, and the Consultant shall update the schedule monthly to show actual progress to date and anticipated future performance. No changes shall be made to the baseline without approval from the City's PM. The updated schedule shall be submitted with the monthly progress reports together with a summary of significant changes. The Consultant shall submit proposed corrective actions to the City's PM to mitigate negative variances (delays) to baseline as soon as they are identified.
 7. **Monthly Progress Reports:** Consultant shall prepare and submit a monthly progress report within ten (10) business days of the last calendar day of the reporting month unless requested otherwise by the City. The monthly progress report shall be a written summary of progress made on each task, estimate the overall task's percent completion, include the status of each deliverable, and an estimate of the total labor hours and costs incurred during the reporting month. The monthly progress report shall also include any significant issues encountered, risks or concerns that the Consultant might have (e.g., anticipates difficulty meeting deadlines due within the next thirty (30) days for some reason beyond their control).
 8. **Monthly Invoices:** Consultant shall prepare and submit invoices monthly. The invoices shall align with the information presented in the monthly progress report described above for that billing period. The invoices shall be accompanied by the monthly progress report described above for that billing period.
 9. **Client Kickoff Meeting:** Consultant shall organize and facilitate a four (4) hour Kickoff Meeting and Project Quality Management Workshop with City staff. Consultant's PM and the appropriate Consultant's Project team members shall attend the Kickoff Meeting and Project Quality Management Workshop. Topics to be discussed at the meeting(s) shall include the following:
 - a. Introduction of key Consultant and City Project team members;
 - b. Review of Consultant's understanding of the Project scope, needs and objectives;
 - c. Summary of Project scope, work plan, schedule and deliverables;
 - d. Recap of previously completed analyses, studies, and reports associated with the Project;
 - e. Discussion of other CIP or maintenance projects currently underway and/or planned to be initiated that may be dependent on and/or have implications for the Project;
 - f. Additional information Consultant has deemed relevant to Project which will be provided by the City, if available; and
 - g. Presentation of Quality Management Plan and discussion of Project approach.
 10. **Additional Client Meetings:** In addition to the Kickoff Meeting and Workshops, Consultant shall organize and facilitate regularly scheduled monthly meetings to discuss the Project's progress and other issues, unless otherwise determined not to be needed by the City's PM or unless more frequent meetings are needed as determined by the City PM. These meetings are expected to have at least one (1) Consultant staff member in attendance unless teleconference is authorized by the City's PM. Topics discussed at the monthly meetings shall be determined as conditions develop and in collaboration with the City. As determined by the City, the City can use the allocated budget for this task for other items such as Consultant attendance at a

Treatment Plant Advisor Committee meeting and/or O&M staff calls with Consultant staff.

11. Quality Management Plan (“QMP”)

- a. Consultant shall develop and implement a Project-specific QMP to support execution of the work required by this Approved SO. The QMP shall describe the Consultant’s overall quality management process, identify the quality reviewers and the review levels associated with each Project milestone and deliverable. The QMP shall be a single deliverable with no monthly updates required.
- b. Consultant’s quality reviewers and their respective qualifications shall be identified in the QMP. Quality reviewers shall be independent (i.e., not be part of the Consultant’s core team for the Project) and shall be qualified reviewers to provide technical and readability reviews prior to submittal of Project deliverables to the City.
- c. Consultant’s review of deliverables, including draft and final versions, shall be recorded by submission of a Quality Review Form. The completed Quality Review Form will document the quality review process applied for that deliverable and summarize the comments addressed during the review.
- d. Consultant quality management efforts that should be addressed in the QMP include:
 - Coordinating work products, milestones, staff assigned for review activities and other information and detail this information along with quality review general criteria in a submitted QMP for City review;
 - Conducting milestone technical and readability reviews for Project deliverables;
 - Documenting comments and work product modifications in the PDL; and
 - Completing and submitting a Quality Review Form with each deliverable, including draft and final versions.

12. Health and Safety Plan (“HASP”): Consultant shall prepare a HASP for the Consultant’s portion of the project that may include any field work, assessment or investigations as part of this task or any other conditions assessment as part of the Project. The HASP shall include Consultant’s confined space entry program, in accordance with the City’s Confined Space Program, and assessments as well as general visits to the RWF. The HASP shall be a single deliverable with no monthly updates required, unless addendums are required as new conditions are encountered. It is assumed that the City will provide safe access to sites to be inspected for this project in accordance with the HASP, including activities such as lockout/tagout, etc.

13. Confined Space Rescue Services:

- a. Consultant shall provide rescue services associated with permit-required confined space entry during inspections and testing. Rescue services shall be provided by specialized contractor familiar with the RWF to support personnel on all confined space entries. All Consultant personnel associated with this task shall be properly trained and certified per OSHA regulations and the City’s requirements.
- b. Consultant shall consult with City staff and shall determine if the inspection spaces meet the regulatory requirements to be classified as either non-permit-required confined spaces or permit-required confined spaces in accordance with 9 CCR Section 5157.
- c. If the space is classified as a permit-required confined space based on the presence or potential for the presence of an atmospheric hazard only, Consultant shall evaluate if “alternate procedures”, as outlined in 8 CCR Section 5157 (c)(5)

and RWF reclassification requirements, can be employed that will allow the space to be reclassified.

- d. If the space is classified as a permit-required confined space, or if the site requires that all confined spaces be classified as permit-required confined spaces, Consultant shall provide onsite rescue services in accordance with the requirements of 8 CCR Section 5157 (k) and RWF Confined Space Procedures. The services shall include providing one or more staff members and all equipment needed to ensure that adequate rescue services are available when staff enters the various spaces. The Consultant must participate in debriefing sessions with RWF's Industrial Safety Officer following confined space entries and make available the material safety data sheets of any hazardous materials they shall be using in the confined space.

B. Deliverables: Consultant shall provide the following documents to the City PM throughout the entirety of the Project for all tasks. Unless otherwise specified, the Consultant shall allow the City fifteen (15) business days to review, compile, and provide comments on any major deliverables. All documents shall be submitted to the City's PM unless stated otherwise.

1. Meetings and Workshops:

a. Agenda and Materials

☐ Agenda, meeting materials, and presentation provided in electronic editable format no later than five (5) business days before the meeting. Consultant shall also provide sufficient printed copies of the final agenda and any handouts for meeting attendees.

b. Minutes

☐ Draft minutes in an electronic editable Microsoft Word file format submitted within five (5) business days after the meeting. Consultant shall allow City a minimum of five (5) business days to review, compile, and provide comments.

☐ Final minutes addressing City comments provided in electronic PDF file format submitted to the City's PM within five (5) business days after receipt of City comments.

2. Technical Memoranda (as applicable for all tasks under this SO):

a. Draft Version

☐ Draft memorandum provided as five (5) bound printed copies, one (1) electronic editable WORD file format, and one (1) electronic PDF file. Consultant will allow City a minimum of ten (10) business days to review, compile, and provide comments to draft technical memoranda. The City's PM will reconcile all City comments into a single set of comments in a Microsoft Word file (track changes format).

b. Final Version

☐ Final memorandum addressing City comments provided as five (5) bound printed copies and one (1) electronic PDF file within ten (10) business days after receipt of City comments, unless otherwise noted or agreed upon by City's Project Manager and Consultant's PM.

3. Project Schedule:

a. Consultant shall provide the project schedule in a PDF and an electronic editable file format.

b. Consultant shall provide initial schedule at Kickoff Meeting and monthly updates with monthly progress reports.

4. PDL: Consultant shall provide PDL monthly, in an electronic editable Microsoft Excel format, with monthly progress reports.
 5. PWP:
 - a. Draft PWP shall be provided in an electronic editable Microsoft Word file format within fifteen (15) business days from the issuance of the NTP for this Approved SO. Consultant shall allow City a minimum of ten (10) business days to review, compile, and provide comments.
 - b. Final plan addressing City comments provided in electronic PDF file format within five (5) business days after receipt of City comments.
 6. QMP:
 - a. Draft QMP provided in an electronic editable file format to the City when the draft PWP is provided to City (can be included in the PWP).
 - b. Final QMP addressing City comments shall be provided in electronic PDF file format within five (5) business days after receipt of City comments.
 7. HASP to be provided prior to the initiation of site investigations. Consultant will submit one (1) electronic PDF file.
 8. Monthly progress reports provided in electronic PDF file format.
 9. Monthly invoices provided as one (1) printed document and in electronic PDF file format.
- C. Completion Time:** Consultant must complete the services and deliverables for this task in accordance with whichever one of the following times is marked:

- On or before the following date: February 28, 2023.
- On or before _____ Business Days from _____

Task No. 2: Background Review and CIP/O&M/Vendor Interviews

A. Services:

1. Collect and review existing background material
 - a. Consultant will gain an understanding of the existing infrastructure required to be assessed by reviewing recording drawings, Computerized Maintenance Management System ("CMMS") data, previous condition assessment reports, relevant studies, historical operational and maintenance data, ongoing and/or prior completed CIP improvements or condition assessment work, as provided by the City for convenience and reference purposes only. The Consultant shall review the following references and bring to the attention of the City any incorrect or inconsistent information encountered during the background review, and request additional information from the City, if available. :
 - i. Condition Assessment of Four Primary Settling Tanks, V&A, October 2009
 - ii. Infrastructure Condition Assessment, CH2M Hill, May 2007
 - iii. Confined Space Program Guidelines (EHSP-207), City of San Jose, June 2010
 - iv. Structural Design Guidelines, CIP, April 2017
 - v. Primary Effluent Pump Station Pump Inspection Report, MarTech, December 2016
 - vi. Gantt chart showing construction schedules for all CIP projects in 2021
 - vii. RWF CMMS asset inventory data for the East/West Clarifiers and the Primary Effluent Pump Station
2. Operations and Third-Party vendor interviews
 - a. Consultant will interview RWF CIP and O&M Staff about process performance and maintenance related issues on the Primary Clarifiers and PEPS. Up to six (6) conference

calls with various disciplines in the City may be necessary.

- b. In coordination with O&M staff, Consultant shall contact third-party vendors responsible for repairing and rehabilitating pumps and related equipment for the City. Up to three (3) conference calls may be necessary.
3. Pre-Assessment Site Walk:
- a. The Consultant shall provide an agenda describing the activities planned to be carried out during the pre-assessment site walk ten (10) business days prior to the site walk taking place.
 - b. The Consultant will then conduct a site walk of the Primary Clarifiers and PEPS. This site walk will occur over a period of two (2) days. The site walk will provide information to develop a plan for the condition assessment testing and assessment work. No confined space entry will be performed during the pre-assessment site walk.

B. Deliverables: Consultant shall provide the following to the City PM:

1. Consultant will schedule a two (2) hour meeting with the City to discuss the findings of the desktop background review, and provide a summary of decisions made by email to the City's PM for approval prior to the Pre-Assessment Site Walk.
2. Consultant will prepare a memorandum summarizing the pre-assessment site walk activities. This memorandum should also contain a section summarizing the desktop background review conducted earlier, including information obtained from O&M staff and vendor interviews.

C. Completion Time: Consultant must complete the services and deliverables for this task in accordance with whichever one of the following times is marked:

- On or before the following date: February 28, 2023.
- On or before _____ Business Days from _____

Task No. 3: Condition Assessment, Seismic Analysis, and Estimation of Remaining Useful Life

A. Services: Specific activities related to the condition assessment work for the Primary Clarifiers and PEPS include:

1. Condition Assessment Plan:
 - a. Following the pre-assessment site walk, and prior to conducting the condition assessment, the Consultant shall develop a comprehensive Condition Assessment Plan to include the following:
 - Field investigation and condition assessment approach, including a preliminary schedule for all work needing to be completed as part of the Study;
 - A step-by-step work sequencing plan that includes a detailed description of the condition assessment activities, processes affected as a result of the condition assessment based on input from City Staff, anticipated durations of the assessment and required facility isolation(s);
 - All applicable requirements as stated in the Process Shutdown Request ("PSR") form;
 - Inspections and testing requirements at each facility;
 - Proposed access locations and confined space entry requirements;
 - Anticipated tools, techniques, equipment, labor, resources, etc.;
 - All required safety and inspection forms;
 - Communications plan;
 - Facilities needing to be exercised (i.e., pumps and valves) by O&M staff and schedule for completion of this work;
 - Spill prevention or any contingency plans;

- Space requirements for vehicle parking, equipment staging and working space; and
 - Requested water and electrical power supply, if available.
- b. Consultant will conduct a two (2) hour workshop with the City and O&M staff to discuss the Condition Assessment Plan and reach consensus on the requirements, methodology and timeline of the condition assessment for the Primary Clarifiers and PEPS. The workshop will be conducted after a summary of the final discussion points and presentation is prepared and delivered to the City's PM five (5) days prior to the meeting.
- c. Following the workshop, a Condition Assessment Plan will be submitted to the City for review and comment forty-five (45) days before the commencement of the inspection and testing field work. Depending on whether or not the condition assessment of the Primary Clarifiers or the PEPS needs to be coordinated with other ongoing projects to minimize burden on City Staff, the submission deadline can be reduced upon approval by the City PM. The Consultant will develop a construction interface calendar in coordination with the City.
- d. Consultant will prepare a PSR to be reviewed and approved by the City twenty-eight (28) days prior to any required shutdown activities or flow diversions at the RWF. The Consultant shall address City comments to the PSR, and coordinate the approval of the PSR prior to the commencement of the condition assessment work.
2. Inspection and Testing: Consultant shall evaluate the process, structural, mechanical, electrical, instrumentation and controls components of the Primary Clarifiers and PEPS as outlined in Appendix A. Key condition assessment tasks from Appendix A are described in further detail below.
- a. Structural/Corrosion: The structural and corrosion condition assessment inspection and testing will include:
- i. Non-Destructive Assessment: Conducting visual assessment and taking digital photographs and/or videos of structural and corrosion of the concrete and metal assets; and documentation of location and width measurement of major cracks.
 - ii. Concrete Destructive Testing: Concrete coring on lower and upper concrete walls as accessible from an access point. All core holes will be repaired using a hand-applied, quick-setting repair mortar such as SikaRepair 223. Surface penetrating radar will be used to locate rebar prior to coring to prevent coring through rebar. Core hole repair method and material specification to be provided to the City in advance of implementing repair. Laboratory testing and analysis of cores may include:
 - 1. Compressive strength (ASTM C42).
 - 2. Incremental chloride testing
 - 3. Incremental pH testing
 - 4. Macro-section and phenolphthalein indicator testing
 - iii. Penetration Test (impact hammer): Delamination survey on concrete accessible from ground level without scaffolding from the structure floor by striking a hammer on the surface of the concrete.
 - iv. Corrosion: electric potential (ASTM C 876): Half-cell potential testing will be conducted to investigate widespread corrosion within a structure.

- v. Surface pH and Penetration Depth: The in-situ surface pH of the concrete surfaces and the penetration depth to sound concrete will be measured.
 - vi. Ultrasonic Thickness Testing: Remaining wall thickness on accessible metal piping will be measured using Ultrasonic Thickness Measurement Testing Method. Representative corrosion pits will be measured using a dial or Thorpe pit depth gauge where there is significant metal corrosion.
 - vii. Coatings: A visual assessment of remaining coatings will be performed, and thickness of concrete coatings at core holes will be assessed.
 - viii. Dry Film Thickness: The thickness testing on the coatings of metal piping will be measured.
 - ix. Weld Deformities: A visual assessment of the weld deformities will be performed.
 - x. Below grade structure and equipment: Access below grade structures, including at the PEPS (dry well), clarifiers (sludge and drain pumps) and scum pit (scum pumps), and perform inspection and testing. One-half (0.5) day is assumed as the inspection and testing period for the below grade structure.
 - xi. Above grade structure and equipment: Access above grade structure and perform inspection. One-half (0.5) day is assumed as the inspection period for the above grade structure.
- b. Mechanical: The mechanical condition assessment inspection and testing will include:
- i. Visual assessment of all equipment and related appurtenances in the Primary Clarifiers and PEPS (for e.g., pumps, tanks, troughs, channels, gates, chain and flight sludge collector mechanisms, drives and gearboxes, valves and actuators, interconnecting pipes, meters, probes, etc.).
 - ii. Observing RWF O&M staff exercising of various pumps, valves and process mechanical equipment during the inspection and testing period, and noting any discrepancies or irregularities.
 - iii. Perform pump vibration tests to verify whether there is excessive vibration of rotating assemblies, such as impeller drive line and motor and reviewing the balance of the rotating assembly.
 - iv. Check pump bearing housing temperature and for indication of worn bearings.
 - v. Check pump for leaky seals caused by excessive shaft runout, worn seals, worn seals, poor seal water supply and quality.
 - vi. Conduct external visual inspection and inspection of accessible portions of the pump, including the seals/ water supply system, during the field inspections.
- c. Electrical: The electrical condition assessment inspection and testing include:
- i. Visual assessment of process electrical systems, including motor control centers, switchboards, switchgears, motors, variable frequency drives, lighting and communication.
 - ii. Load analysis and report on the adequacy or inadequacy of the existing electrical system.
 - iii. Overcurrent protection devices and motor starters.
 - iv. Megger and VLF testing of electrical wiring.
 - v. IR thermography of electrical power distribution.
 - vi. Electrical Tests of MV Wiring and Transformers, including:
 - 1. Resistance measurements: insulation, connections, winding-winding, winding-ground, winding at tap, core ground insulation;

2. Turns ratio;
 3. Power-factor/dissipation-factor;
 4. Excitation-current
- d. Instrumentation and Control: The instrumentation and control condition assessment will include:
 - i. Assessing all instrumentation associated with the Primary Clarifiers and PEPS .
 - ii. Assess workstations (ABB DCS) to confirm if any upgrades are required.
3. Code Review: The Consultant shall document potential code compliance issues (building code, fire code, seismic, electrical, power, etc.) that may be observed while performing condition assessments, however a code compliance assessment will not be performed.
4. PEPS Pump Performance Testing:
 - a. Consultant shall perform hydraulic performance testing at the PEPS to verify whether or not the pump performance matches the system requirements.
 - b. Prior to initiating the performance testing, Consultant shall review available operations data (e.g., pump age, run times, flow, pressure, power consumption and basic control strategy), maintenance data (repair history, spare parts, prior condition assessments, and vendor reports from prior rehabilitation/repair work), and any prior testing results (vibration, bearing temperature, listening for unusual noises and pump hydraulic performance testing).
 - c. All performance testing will be based on RWF operational flexibility, and the number of pumps that can be exercised for testing during the testing and inspection period.
5. Seismic Evaluation: Consultant shall perform a seismic evaluation of the Primary Clarifiers, PEPS and related appurtenances, including access walkways and stairways. Seismic evaluation will be in accordance with ASCE 41 consisting of a Tier 1 screening and Tier 2 deficiency-based evaluation. The seismic evaluation shall be conducted in accordance with the CIP Structural Design Guidelines and in accordance with the details listed in Appendix A.
6. Estimation of Remaining Useful Life: Consultant shall develop an estimation of remaining useful life for equipment and appurtenances in the Primary Clarifiers and PEPS. The Consultant shall also make recommendations for repairs and/or rehabilitation required to extend the remaining useful life of the Primary Clarifiers to the year 2051. The Consultant can use spreadsheets or software to estimate the remaining useful life.
7. Confined Space Entry Requirements:
 - a. Primary Clarifiers:
 - i. Consultant will be required to enter confined space in two (2) East Primary Clarifier tanks and two (2) West Primary Clarifier tanks (no scaffolding) to perform inspection and testing over a two (2) day period.
 - ii. Primary Clarifiers Influent and Effluent Channels: Perform a confined space entry (no scaffolding) in accessible influent and effluent channels to perform inspection and testing over a one (1) day period.
 - b. PEPS:
 - i. Consultant will be required to enter confined space at the PEPS wet well (no scaffolding) over a one (1) day period.

8. Opinion of Probable Construction Cost (“OPCC”):

- a. Consultant will prepare Class 5 OPCCs and assemble annual operation and maintenance cost estimates. The Consultant will develop net present value costs that includes capital costs, and annual (or otherwise periodic) costs associated with construction, operation, maintenance, and material replacement to extend the remaining useful life of the Primary Clarifiers to the year 2051. The OPCCs will be prepared to a level of accuracy consistent with the standards of AACE International, formerly known as the American Association of Cost Engineering and the Association for the Advancement of Cost Engineering, and adhere to the CIP’s cost estimating guidelines.

9. Development of draft and final TM1:

- a. The Consultant shall hold a four (4) hour workshop with the City to discuss the results of the Condition Assessment. The workshop will be conducted after a summary of the final discussion points and presentation is prepared and delivered to the City’s PM five (5) days prior to the meeting.
- b. Following the conclusion of the Condition Assessment results workshop, the Consultant will prepare a draft and final TM1 that documents the results of the condition assessment. TM1 will include the following items:
 - i. Brief description of existing facilities;
 - ii. Process overview of the Primary Clarifiers and PEPS that describes the facilities and process performance and identifies items of concern or improvement;
 - iii. Approach for condition assessment activities;
 - iv. Tabular summary of assessment observations and test results;
 - v. Tabular summary of current condition of facilities, recommended improvements, and improvement time frames, as applicable. Prioritization of improvements will be reflected in the recommended repair/replacement time frames;
 - vi. Results of the condition assessment analysis for the Primary Clarifiers and PEPS will include remaining useful life determinations. Remaining useful life will be determined based on forecasted replacement or rehabilitation time frame;
 - vii. Results of the condition assessment analysis for the Primary Clarifiers will include recommendations for repairs and/or rehabilitation required to extend the remaining useful life of the Primary Clarifiers to the year 2051;
 - viii. Results of the seismic analysis;
 - ix. Levels of Service Recommendations: The recommendations of the condition assessment will be based on the levels of service, performance requirements and forecasted operations and maintenance for the facilities. If this information is not available or provided by the City, the Consultant propose assumptions for use by the City regarding levels of service; and
 - x. Opinion of Probable Construction Cost.
- c. Following conclusion of all workshops, the Consultant will prepare a final summary document that will include an executive summary outlining all work completed, conclusions reached, and recommendations made as part of this study, and include all technical memoranda and references as attachments.

10. Additional Information

- a. Consultant will conduct condition assessment inspection and testing contingent upon existing RWF operations, availability of the area requiring to be assessed, safe access and conditions of the facilities. Consultant shall inform the City of any shifts in the schedule to accommodate unforeseen events.
- b. The City will provide safe access and drain and dewater facilities to be inspected to the extent required. Cleaning and pressure washing of the Primary Clarifiers and PEPS wet wells will be performed by the City. Consultant will work with City to determine the minimum cleaning required to complete the assessments and testing.
- c. Consultant will work with the City to plan and coordinate shutdowns. Equipment operations associated with inspection and testing will be performed by the City, including shutdowns, isolations, equipment operation, and lockout-tagouts.

B. Deliverables: Consultant shall provide the following to the City PM:

- 1. Agenda and Workshop Materials
 - a. Agenda, meeting materials, and presentation provided in electronic editable format no later than five (5) business days before the meeting.
- 2. Minutes
 - a. Draft minutes in an electronic editable Microsoft Word file format submitted within five (5) business days after the meeting with decision log and action items. Consultant shall allow City a minimum of five (5) business days to review, compile, and provide comments.
 - b. Final minutes addressing City comments provided in electronic PDF file format submitted to the City's PM within five (5) business days after receipt of City comments.
- 3. TM1 :
 - a. Draft memorandum provided as five (5) bound printed copies, one (1) electronic editable Microsoft Word file format, and one (1) electronic PDF file. Consultant will allow City a minimum of ten (10) business days to review, compile, and provide comments to draft technical memoranda. The City's PM will reconcile all City comments into a single set of comments in a Microsoft Word file (track changes format).
 - b. Final memorandum addressing City comments provided as five (5) bound printed copies and one (1) electronic PDF file within ten (10) business days after receipt of City comments, unless otherwise noted or agreed upon by City's Project Manager and Consultant's PM.

C. Completion Time: The Consultant must complete the services and deliverables for this task in accordance with whichever one of the following times is marked:

- On or before the following date: February 28, 2023.
- On or before _____ Business Days from _____

Task No. 4: Primary Clarifier and PEPS Improvements Conceptual Construction Sequencing

A. Services:

1. Confirm required improvements for the Primary Clarifiers and the PEPS develop conceptual construction sequencing based on recommendations outlined in TM1.
 - a. The Consultant shall develop a conceptual construction sequencing approach and timeline for the Primary Clarifiers and PEPS facilities improvements recommended in TM1.
 - b. The Consultant shall include as part of the conceptual construction sequencing any improvements recommended in Task 5.
 - c. The Consultant shall identify whether the recommended rehabilitation timeline for the PEPS impacts conceptual construction sequencing of the East and West Primary Clarifiers, or vice versa.
2. Define conceptual construction sequencing constraints
 - a. The Consultant shall identify RWF operational and shutdown requirements that could potentially impact conceptual construction sequencing of the East and West Primary Clarifiers and the PEPS, and prepare a list of constraints, including:
 - i. Hydraulic capacity limitation of the East Primary Clarifiers (verified in Task 5);
 - ii. Hydraulic capacity limitation of the West Primary Clarifiers (based on prior fieldwork performed by the City);
 - iii. Minimum requirements for primary treatment (wet and dry weather, based on prior studies);
 - iv. Operational workarounds required during construction (based on input from City staff);
 - v. Routine maintenance shutdowns (based on input from City staff);
 - vi. Ongoing and future CIP projects (based on input from City on project interfaces)
3. Estimate duration of construction
 - a. The Consultant shall estimate construction durations for improvements related to the Primary Clarifiers identified for implementation in Task 4.A.1.
4. Develop conceptual construction sequencing timeline
 - a. The Consultant shall develop a 10-year conceptual construction sequencing timeline for the East and West Primary Clarifiers, including activities for planning, design, bid and award and construction based on a design-bid-build procurement method. Typical durations for bid and award, pre-construction activities, and procurement will be provided by the City.
 - b. The Consultant shall identify opportunities for implementing the PEPS improvements concurrent to the East and West Primary Clarifiers improvements and develop a PEPS conceptual construction sequencing timeline.
 - c. The Consultant shall update the OPCCs and NPVs prepared in Task 3 using capital cost escalation guidance provided by the City where applicable. The OPCCs and NPVs for the selected East Primary Clarifier improvements shall reflect the conceptual construction sequencing timeline developed in Task 4.
5. Technical Memorandum No. 2 (TM2): Consultant shall prepare the draft and final TM2 and will include the following items:
 - a. Improvements identified for the Primary Clarifiers and PEPS conceptual construction sequencing;
 - b. Ten (10) year conceptual construction sequencing approach and implementation schedule;
 - c. Operational and shutdown constraints;

d. OPCCs and NPVs

6. Meetings: The Consultant shall conduct up to six (6) conference calls to discuss and review the recommended improvements, operational and programmatic constraints, conceptual construction sequencing activities and project results.

B. Deliverables: Consultant shall provide the following to the City PM:

1. OPCC and NPVs
 - a. Draft report provided as an electronic editable Microsoft Excel file and one (1) electronic PDF file. Consultant shall allow City ten (10) Business Days to review, compile and provide comments.
 - b. Final report addressing City comments provided as an electronic editable Microsoft Excel file and one (1) electronic PDF file within five (5) Business Days after receipt of City comments.
2. TM2
 - a. Draft memorandum provided as five (5) bound printed copies, one (1) electronic editable Microsoft Word file format, and one (1) electronic PDF file. Consultant will allow City a minimum of ten (10) business days to review, compile, and provide comments to draft technical memoranda. The City's PM will reconcile all City comments into a single set of comments in a Microsoft Word file (track changes format).
 - b. Final memorandum addressing City comments provided as five (5) bound printed copies and one (1) electronic PDF file within ten (10) business days after receipt of City comments, unless otherwise noted or agreed upon by City's Project Manager and Consultant's PM.

C. Completion Time: The Consultant must complete the services and deliverables for this task in accordance with whichever one of the following times is marked:

- On or before the following date: February 28, 2023.
- On or before _____ Business Days from _____

Task No. 5: East Primary Clarifier Capacity Assessment

A. Services: Consultant shall perform a desktop modeling analysis to determine the hydraulic capacity of the East Primary Clarifiers, followed by a field assessment to calibrate or confirm model parameters as determined by the Consultant. The Consultant shall also review the hydraulic capacity of the effluent pipeline to the PEPS and the Settled Sewage Pump Station (SSPS) and inform the City of deficiencies. The East Primary Clarifier capacity assessment shall consist of the following:

1. Perform desktop hydraulic evaluation
 - a. Background Review:
 - i. The Consultant shall review existing the existing Visual Hydraulics (VH) model of the Primary Clarifiers provided by the City. The Consultant shall then assess the suitability of the VH model for the hydraulic capacity analysis, identify data gaps and recommend model updates. Consultant shall agree with the City as to which model updates shall be performed.
 - ii. The Consultant shall also review the following reference documents:
 1. TM8, Secondary System Hydraulic Evaluation, Brown and Caldwell, November 2017;

2. Flow Management Report, Stantec, July 2017;
 3. Flow and Load Projection Update, Stantec, July 2019
 4. Study 16, Chemically Enhanced Primary Treatment, CIP, July 2020;
 5. RWF Hydraulic Profile Review, BC, August 2021
- b. Hydraulic Model Update:
- i. The Consultant shall update the VH model to accurately represent the dimensions and attributes of the East Primary Clarifiers, including associated influent pipelines, influent channels, effluent channels and effluent pipelines to the PEPS and SSPS.
 - ii. The downstream boundary condition for the VH model for the north and south sides of the East Primary Clarifiers shall be the PEPS and SSPS respectively.
- c. Model Calibration:
- i. The Consultant shall prepare an approach for the model calibration and provide the City with a list of data requirements. The model will be calibrated using data provided by the City.
 - ii. Data gaps will be addressed using assumptions based on engineering judgement or by performing field testing.
 - iii. The Consultant shall confirm the water levels/freeboard in channels, tanks and wetwells with the City prior to conducting the hydraulic analysis.
 - iv. The Consultant shall confirm the number of tanks in service and redundancy criteria with the City prior to conducting the hydraulic analysis.
- d. Hydraulic Analysis
- i. The Consultant shall perform a hydraulic analysis to verify the existing capacity of the East Primary Clarifiers.
 - ii. If the existing capacity of the clarifiers is not adequate to meet EPHWWF, the Consultant shall recommend and incorporate improvements within the VH model to meet EPHWWF (adding additional inlets, raising weirs or walls, performing flow distribution modifications, increasing conduit sizes, etc.). in agreement with the City.
 - iii. The Consultant shall subsequently perform a hydraulic analysis to evaluate whether the East Primary Clarifiers can accommodate the EPHWWF after the recommended improvements are incorporated.
- e. Process Review
- i. Consultant shall conduct a high-level process review to verify that any recommended improvements to accommodate the EPHWWF in the East Primaries do not impact the overall primary treatment process.
 - ii. The Consultant shall review the City's Chemically Enhanced Primary Treatment (CEPT) memorandum along with historic operational data for the East Primary Clarifiers to confirm the ability of the East Primary Clarifiers to operate consistently at high Surface Overflow Rates (SORs) for extended durations (6 hours or more).
 - iii. The Consultant shall recommend whether additional capacity testing is required to verify or confirm SORs predicted by the City.
- f. Any improvements required to pass the EPHWWF through the East Primary Clarifiers will be included in the conceptual construction sequencing timeline and cost estimates described in Task 3.
- g. Any improvement recommendations and associated costs will be conceptual in nature and no detailed engineering analysis or design will be performed by the Consultant.

2. Perform Field Capacity Testing

- a. The desktop hydraulic evaluation will require field testing to fill data gaps or support any engineering assumptions derived from the VH model.
 - b. The Consultant shall develop a field capacity testing plan, including the testing approach, testing sequencing, and data monitoring and collection at various locations. City shall agree with the Consultant on the field capacity testing plan.
 - c. Existing treatment facilities will be operated by City Staff during this testing period in accordance with the field capacity testing plan.
3. Technical Memorandum No. 3 (TM3): Consultant shall prepare the draft and final TM3 and include the following:
- a. Summary of the desktop hydraulic capacity analysis, including data gaps, model updates, calibration techniques and testing approach;
 - b. A list of hydraulic bottlenecks in the East Primary Clarifiers, including in the influent channel, effluent channel, and effluent conduits to the PEPS and SSPS.
 - c. Proposed improvements to the East Primary Clarifiers to allow the EPHWWF to pass through the East Primary Clarifiers;
 - d. Capacity of the West Primary Clarifiers;
 - e. Improvements to the West Primary Clarifiers;
 - f. Results of the process review;
 - g. Field capacity testing plan and results.
4. Meetings:
- a. The Consultant shall conduct up to six (6), one (1) hour biweekly meetings to discuss progress.
 - b. The Consultant shall conduct three (3), two (2) hour meetings to discuss findings with City staff, review recommended improvements, review operational and programmatic constraints, outline conceptual construction sequencing activities, review modeling approach and results, and discuss field capacity testing results.

C. Deliverables: Consultant shall provide the following to the City PM:

1. VH Model Files
 - a. All modeled configurations, including input and output files.
 - b. PDF files showing the output from the VH model runs.
2. TM3
 - a. Draft memorandum provided as five (5) bound printed copies, one (1) electronic editable Microsoft Word file format, and one (1) electronic PDF file. Consultant will allow City a minimum of ten (10) business days to review, compile, and provide comments to draft technical memoranda. The City's PM will reconcile all City comments into a single set of comments in a Microsoft Word file (track changes format).
 - b. Final memorandum addressing City comments provided as five (5) bound printed copies and one (1) electronic PDF file within ten (10) business days after receipt of City comments, unless otherwise noted or agreed upon by City's Project Manager and Consultant's PM.

B. Completion Time: The Consultant must complete the services and deliverables for this task in accordance with whichever one of the following times is marked:

CPMS Contract No. 7995
Service Order No.: 7 (Fourth Amendment)
Consultant: AECOM Technical Services, Inc.

- On or before the following date: February 28, 2023.
- On or before _____ Business Days from _____

CPMS Contract No. 7995
 Service Order No.: 7 (Third Amendment)
 Consultant: AECOM Technical Services, Inc.

First Second Third **Fourth Revised Attachment C: Compensation Table**

This Revised Attachment C is an attachment to the First Second Third Fourth amendment to Approved Service Order No. 7 issued pursuant to the Master Agreement having the above-referenced CPMS Contract No.

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7
Task No. and Task Title from Attachment A	Invoice Period	Multiplier Compensation	Contract Personnel	Reimbursable Expenses (Including applicable markup)	Subconsultant Costs (Including markup)	Total Compensation
Task No. 1: Project Management and Quality Assurance / Quality Control	<input checked="" type="checkbox"/> Monthly <input type="checkbox"/> Completion of Task(s) <input type="checkbox"/> Completion of Work	\$ 92,389	\$ 0	\$ 0	\$ 20,843	\$ 113,232
Task No. 2: Background Review and CIP/O&M/Vendor Interviews	<input checked="" type="checkbox"/> Monthly <input type="checkbox"/> Completion of Task(s) <input type="checkbox"/> Completion of Work	\$ 83,897	\$ 0	\$ 0	\$ 20,307	\$ 104,204
Task No. 3: Condition Assessment, Seismic Analysis and Estimate of Remaining Useful Life	<input checked="" type="checkbox"/> Monthly <input type="checkbox"/> Completion of Task(s) <input type="checkbox"/> Completion of Work	\$ 370,189	\$ 0	\$ 1,888	\$ 217,992	\$ 590,069
Task No. 4: Primary Clarifier and PEPS Improvements Conceptual Construction Sequencing	<input checked="" type="checkbox"/> Monthly <input type="checkbox"/> Completion of Task(s) <input type="checkbox"/> Completion of Work	\$ 40,720	\$ 0	\$ 0	\$ 0	\$ 40,720
Task No. 5: East Primary Clarifier Capacity Assessment	<input checked="" type="checkbox"/> Monthly <input type="checkbox"/> Completion of Task(s) <input type="checkbox"/> Completion of Work	\$ 147,330	\$ 0	\$ 4,000	\$ 0	\$ 151,330
Maximum Compensation		\$734,525	\$ 0	\$ 5,888	\$ 259,142	\$999,555