SECOND AMENDMENT TO AGREEMENT

THIS SECOND AMENDMENT TO AGREEMENT (Amendment) made and entered into as of this _____ day of April 2020, amends the Agreement theretofore entered between the CITY OF FRESNO, a California municipal corporation (City), and CAROLLO ENGINEERS, INC., a Delaware corporation (Consultant).

RECITALS

WHEREAS, the City's Wastewater Management Division operates the Fresno-Clovis Regional Wastewater Reclamation Facility (RWRF) in accordance with Waste Discharge Requirements (WDR) Order R5-2018-0080 adopted by the Central Valley Regional Water Quality Control Board (Board) on December 13, 2018; and

WHEREAS, the City and the Consultant entered into an agreement on May 21, 2019, (Agreement) to provide professional consulting services for the preparation of workplans for the evaluation of the existing groundwater monitoring well network and arsenic and manganese assessment at the RWRF (Project) as required by the WDR for a total fee of $250,000; and

WHEREAS, the First Amendment expanded the scope of services to include evaluation of domestic wells located within the vicinity of the RWRF, including testing for nitrogen-based components as required by the Board and provided an increase to total compensation by an additional $49,287 to complete the expanded scope of services; and

WHEREAS, the workplans completed by the Consultant were submitted to the Board for approval on December 9, 2019 in accordance with the WDR; and

WHEREAS, the City and the Consultant desire to expand the scope of services to include completion of the Arsenic and Manganese Groundwater Compliance Assessment Report for submission to the Board no later than June 7, 2021, as per the WDR and in accordance with the approved workplans; and

WHEREAS, the parties desire to modify the Agreement to revise the project schedule and extend the completion date; and

WHEREAS, due to the need for additional services, the City and the Consultant desire to increase the compensation by $690,044 to complete the amended scope of services resulting in a total Consultant fee of $989,331; and

WHEREAS, with entry into this Amendment, the Consultant agrees it has no claim, demand, or dispute against the City.

AGREEMENT

NOW, THEREFORE, the parties agree that the aforesaid Agreement be amended as follows:

1. **Exhibit A** of the Agreement is amended to expand the scope of services indicated in **Exhibit A2**, attached hereto and incorporated herein by reference.

2. Section 2 of the Agreement is amended in its entirety to read as follows:

> "2. Term of Agreement and Time for Performance. This Agreement shall be effective from the date first set forth above and shall continue in full force and effect through the earlier of complete rendition of the services hereunder or October 29, 2021, subject to any earlier termination in accordance with this Agreement. The services of Consultant as described in **Exhibit A** are to commence upon City's issuance of a written "Notice to Proceed." Work shall be undertaken and completed in a sequence assuring expeditious completion, but in any event, all such services shall be completed within 778 consecutive calendar days from such authorization to proceed."

3. Section 3(a) of the Agreement is amended in its entirety to read as follows:

> "(a) Consultant's sole compensation for satisfactory performance of all services required or rendered pursuant to this Agreement shall be a total fee of Nine-Hundred Eighty-Nine Thousand Three-Hundred Thirty-One dollars ($989,331). Such fee includes all expenses incurred by Consultant in performance of the services."

4. Except as otherwise provided herein, the Agreement entered into by City and Consultant, dated May 21, 2019, as amended on October 25, 2019, remain in full force and effect.

[Signatures follow on the next page.]

IN WITNESS WHEREOF, the Parties have executed this Amendment at Fresno, California, the day and year first above written.

CITY OF FRESNO,
A municipal corporation

By: _____
Michael Carbajal, Director
Department of Public Utilities

APPROVED AS TO FORM:
DOUGLAS T. SLOAN
City Attorney

By: _____ 1/23/2020
Brandon M. Collet Date
Senior Deputy City Attorney

ATTEST:
YVONNE SPENCE, CRM MMC
City Clerk

By: _____
Date
Deputy

Attachment: Exhibit A2

CAROLLO ENGINEERS, INC.,
A Delaware corporation

By: _____

Name: Ken Wilkins Penny Carlo

Title: Senior Vice President Associate Vice President
(If corporation or LLC., Board Chair, Pres. or Vice Pres.)

By: _____

Name: Michael W. Barnes

Title: Corporate Secretary
(If corporation or LLC., CFO., Treasurer, Secretary or Assistant Secretary

EXHIBIT A2

SECOND AMENDMENT TO SCOPE OF SERVICES
Consultant Service Agreement between the City of Fresno (City)
and Carollo Engineers, Inc., (Consultant)
WORKPLANS FOR THE GROUNDWATER MONITORING NETWORK AND ARSENIC & MANGANESE GROUNDWATER ASSESSMENT

Under the original Agreement, Carollo Engineers, Inc. (Carollo), in association with Luhdorff & Scalmanini, Consulting Engineers (LSCE), are authorized to provide professional engineering services to prepare Workplans for the Groundwater Monitoring Network and Arsenic (AS) and Manganese (Mn) Groundwater Assessment. Carollo/LSCE will deliver the following services to Fresno/Clovis Regional Wastewater Reclamation Facility (RWRF) under the terms of Professional Engineering Services for the Fresno/Clovis Regional Wastewater Reclamation Facility *Workplans for the Groundwater Monitoring Network and Arsenic and Manganese Groundwater Assessment.*

The initial scope of work (Tasks 1-5) includes services for Carollo/LSCE to complete two workplans that are required by the Waste Discharge Requirements (WDR) for the RWRF. The first workplan (As/Mn Workplan) establishes the activities and tasks to be conducted to evaluate the impact of As and Mn beneath and downgradient of the RWRF. The second workplan establishes the activities and tasks to be conducted to evaluate the current groundwater monitoring network and its adequacy to characterize the influence on groundwater quality (including arsenic and manganese concentrations) in the vicinity of the RWRF.

Amendment No. 1 expands the scope of work to include a sampling program for one round of sampling of domestic and agricultural wells in the vicinity of the RWRF. The water quality results will be evaluated and used to inform the As/Mn Workplan, and also to support the City's upcoming Initial Assessment for Nitrates, anticipated to begin around the year 2020-2021. The sampling program is covered in Task 6 (Domestic/Agricultural Well Sampling Project).

Amendment No. 2 expands the scope of work to include completion of the **Arsenic and Manganese Groundwater Compliance Assessment (As/Mn Assessment)**, using data collected and evaluated through the work accomplished in Tasks 1 – 6. The WDR requires the City to complete and submit the As/Mn Assessment Report no later than June 7, 2021. The scope of work for the As/Mn Assessment and associated schedule have been developed to meet this deadline.

The As/Mn Assessment is covered under Tasks 7–13 in this Scope of Work. The As/Mn Assessment, the As/Mn Workplan, and the Domestic/Agricultural Well Sampling Project are all intertwined, and the work developed in prior Tasks 1-6 inform and provide the foundation for the As/Mn Assessment. Coordinating the work in Tasks 1-6 with the As/Mn Assessment tasks will be critical to meeting the submission deadline for the As/Mn Assessment.

PURPOSE

Consultant to complete an As/Mn Assessment in accordance with the approved As/Mn Workplan submitted in December 2019.

The Scope of Work assumes the As/Mn Workplan will be approved by the Regional Board by December 31, 2019. The Scope includes all elements associated with Tasks ii. and iii. of Provision J.1.a. of the WDR.

Task	***Description***	***Due Date***
ii.	***Arsenic and Manganese Groundwater Compliance Assessment Report*** *Submit the final Arsenic and Manganese Groundwater Compliance Assessment Report in accordance with the approved Workplan submitted pursuant to Task i of Provision J.1.a. If it is determined through the assessment that elevated arsenic and manganese concentrations have or threaten to impact downgradient domestic wells, the Report shall propose corrective actions (e.g., supplying drinking water to the user(s) of the impacted wells).*	*No later than June 7, 2021*
iii.	*Annually, submit a technical report that includes:* *1) An update on the preparation/implementation of the Arsenic and Manganese Groundwater Compliance Assessment Report,* *2) An analysis of the groundwater quality for arsenic and manganese, and an evaluation whether the arsenic and manganese concentrations at the approved compliance wells are below the applicable arsenic and manganese groundwater limits.*	*February 1, 2021*

CONSULTANT'S SERVICES

The approach to the Groundwater Compliance Assessment is summarized in the workflow diagram shown in Figure 1. The approach comprises three separate, but concurrent, workflows: (1) expansion of the monitoring well network as recommended in the Monitoring Well Network Evaluation and Well Installation Workplan (Tier 1), (2) development and application of numerical flow, transport and reactive transport models for assessing future groundwater quality conditions and determining appropriate locations for the points of compliance, and (3) sampling of domestic and agricultural wells and identification of impacted downgradient users. Tier 1 expansion of the monitoring well network will be implemented concurrently with the proposed compliance assessment; however, monitoring results from newly installed wells may not be available for inclusion in the assessment.

The domestic and agricultural well sampling workflow includes the following major tasks:

- Evaluate Results of Phase 1 Domestic and Agricultural Well Sampling.
- Coordinate with the City on the implementation of Phase 2 Domestic and Agricultural Well Sampling.
- Evaluate Results of Phase 2 Domestic and Agricultural Well Sampling.
- Determine Impacted Domestic Wells.
- Determine/Propose Corrective Actions.

The numerical modeling and compliance assessment workflow includes the following major tasks:

- Develop Numerical Flow and Transport Models.
- Use Models to Assess Future Conditions.
- Re-evaluate Monitoring Well Network.
- Identify Points of Compliance.

- Provide Recommendations for Tier 2 Monitoring Well Network.

At the conclusion of all three workflows, the Compliance Assessment will be documented in an Arsenic and Manganese Groundwater Compliance Assessment Report.

Each of the tasks listed above for the Domestic and Agricultural Well Sampling Workflow and Modeling and Compliance Assessment Workflow is described in greater detail below. The City will be solely responsible for implementing the expansion of the monitoring well network as recommended in the Monitoring Well Network Evaluation and Well Installation Workplan; no tasks related to this workflow are included in the following scope.

Task 7. Evaluate Results of Domestic and Agricultural Well Sampling.

7.1. Phase 1 Sampling

For Phase 1 of the Domestic and Agricultural well survey, the City collected samples from a smaller number of domestic and agricultural wells that were either located closer to the RWRF and /or were included in the previous 2003 well survey and that the well owner had granted permission to sample in the response to the questionnaire or in a door-to-door interview. The City began collecting samples from these wells in October 2019, but sample results were not available in time to be fully incorporated into the evaluations presented in the As/Mn Workplan. Therefore, the first task in Phase 2 will be to further evaluate these sampling results and add the data into the evaluations for further use in Phase 2.

For this evaluation, the data will be quality-checked by reviewing the sample collection records, field parameter data, and laboratory reports; any potential issues identified through this review process will be resolved before the data are approved for use. Once approved, the data will be added to the Fresno RWRF Groundwater Data Information System. Once uploaded in to the database, this data will be included in the development of the numerical flow and transport models. Arsenic speciation and isotope data will be included in this evaluation.

7.2. Phase 2 Sampling

Collection of samples from the Phase 2 group of domestic and agricultural wells will begin as soon as possible after the start of the project. During the Administrative process leading up to the start of the Phase 2 Assessment, the City will continue outreach efforts started in Phase 1 to obtain permission to sample from additional well owners identified in Phase 1.

Results from Phase 2 sampling of domestic and agricultural wells will be evaluated and incorporated into the evaluations presented in the As/Mn Compliance Assessment. To minimize potential re-work, this evaluation process will not begin until results are received from all of the Phase 2 wells.

Just as for the Phase 1 sampling results, the data collected in Phase 2 will be quality-checked by reviewing the sample collection records, field parameter data, and laboratory reports; any potential issues identified through this review process will be resolved before the data are approved for use. Once approved, the data will be added to the Fresno RWRF Groundwater Data Information System.

7.3. Determine Impacted Domestic Wells

The results of both phases of the domestic well sampling program will be used to identify domestic wells that may be impacted by RWRF operations. A thorough, in-depth evaluation will be completed for each of the wells preliminarily identified by initial screening as being potentially impacted by RWRF operations to determine if RWRF operations have resulted in the observed elevated concentrations of arsenic and/or manganese. Other factors to be included in this evaluation may include location of the well in relation to the RWRF (e.g., upgradient, downgradient, cross-gradient), distance from the RWRF disposal ponds, other land uses in the vicinity of the well, concentrations of other constituents in the samples, and other data and information deemed relevant. A key aspect of this analysis is to determine whether RWRF operations have, or could in the future, contribute to an exceedance of the MCL for arsenic or manganese at one of these locations.

Task 7 Deliverables:

- Updated databases of groundwater monitoring data and geospatial features.
- Constituent maps showing domestic and agriculture well results.
- Map of impacted domestic wells.

Task 8. Determine/Propose Corrective Actions

This task assumes there will be at least one domestic well tapping groundwater under the influence of the RWRF with arsenic or manganese concentrations exceeding the applicable MCL. ***If it is found in Task 7.3 that no domestic wells are impacted by RWRF operations, this task would be eliminated.***

Carollo/LSCE will develop a plan that identifies specific activities, and a schedule for implementing those activities, that will be undertaken to ensure immediate access to safe drinking water for those who are dependent on wells that provide groundwater with arsenic or manganese exceeding the applicable MCL. Development of the plan will include the following tasks:

a.) Identification of Potentially Affected Groundwater Users and Outreach. Provide process to identify affected residents and the outreach utilized to ensure that impacted groundwater users are informed of and given the opportunity to participate in the development of proposed solutions.

b.) Actions and Schedule of Implementation. Propose specific actions and a schedule of implementation to address the immediate drinking water needs of those affected groundwater users that do not otherwise have interim replacement water that meets drinking water standards.

c.) Preparation of Plan Report. The Corrective Action Plan will be documented as a Technical Memorandum and will be included as a separate chapter within the overall Compliance Assessment Report.

Task 8 Deliverables:

- Corrective Action Plan TM.

Task 9. Develop Numerical Flow and Transport Models

Development and calibration of the numerical flow and transport models is the longest duration task of the Phase 2 assessment, and this task is critical for determining appropriate locations for the points of compliance. Therefore, this task (particularly flow model development) will begin immediately at the start of Phase 2 concurrent with evaluation of the Phase 1 domestic and agricultural well sampling results and implementation of Phase 2 sampling.

The proposed level of effort for modeling has been developed in light of the recent information on water quality results for the domestic and ag well sampling and also the additional analytes for the monitoring wells at the RWRF. Some factors include:

- Based on the first round of water quality sampling, the constituents of interest, for reactive transport in particular, are not widespread geographically. This will allow the modeling to focus more on a smaller area and reduces the number of reactive transport model input datasets needed, as well as reduces the post-processing and calibration of this aspect of the model.
-

Recognizing that the water quality datasets are limited for most constituents outside of the facility, the assumed effort for analysis and interpolation through space and time for these constituents, e.g. carbonate system constituents, etc., has been reduced.
Model development will be conducted in accordance with the process described in Section 8 of the As/Mn Workplan. Initial development of the flow and transport models will be based on available hydrogeologic and analytical data. Existing hydrogeologic information will be used to develop model hydraulic parameters. Additional data from the Phase 2 domestic and agricultural well sampling along with data from the RWRF monitoring network, including new analytes added in October 2019, will be incorporated into model development. New data will also be considered in the selection of important geochemical processes to be simulated in the chemical reaction network of the reactive transport model.

9.1 Flow Model Development and Calibration

The numerical flow model will be established with appropriate initial and boundary conditions. The numerical flow model elements are provided below:

a) Define the flow model extent to be larger than the As/Mn reactive transport model for future nitrate transport modeling
b) Determine the grid spacing, model layering, simulation time, and temporal and spatial discretization
c) Develop the three-dimensional distribution of the subsurface heterogeneity by assigning initial values of associated parameters (hydraulic conductivity, specific storage, and specific yield). These parameters will be determined based on hydrogeologic conceptualization in the vicinity of the RWRF and will capture the heterogeneity encountered in the subsurface as seen in well completion reports and lithology logs in the area.
d) Assign initial conditions of the hydraulic head at start of the model simulation time. Initial groundwater levels will be based on interpolated contour maps of groundwater elevation for each model layer.
e) Assign boundary conditions along the model domain area
f) Assign appropriate source and sink terms that can simulate hydrologic features (wells, pond, canals, and irrigated lands) that represent physical features within the study area where water

enters and leaves the aquifer system.

g) Calibrate the flow model by adjusting hydraulic parameters, boundary conditions, and source/sink parameters to obtain a good match (within a reasonable range) between simulated and measured groundwater hydraulic heads.

h) Results of the calibrated flow model will be presented in different formats (tables, time-series plots, cross sections, and maps). The results include model fit descriptive statistics, water budgets, and groundwater levels in different vertical horizons and for different time scales.

9.2 Transport Model Development and Calibration

The development and calibration of the numerical transport model will simulate the fate and transport of conservative constituents (TDS and chloride). This will involve using the calibrated flow model flux output as described above and incorporating transport parameters and features. The numerical transport model elements are provided below:

a) Define the transport model extent, which is same as the flow model domain
b) Define the temporal discretization of the numerical transport model which will be finer than flow model temporal discretization
c) Transport parameters (porosity, dispersivity, and effective diffusion coefficient) initial values will be assigned based on literature values considering soil class and constituent type.
d) Assign initial conditions for TDS and chloride concentrations at the start of the model simulation time.
e) Assign TDS and chloride concentrations to boundary conditions and sources with associated hydrologic features water fluxes
f) Transport model calibration and sensitivity targets and calibration criteria will be developed, focusing on achieving a representative fit to measured TDS and chloride concentrations. Transport parameters such as porosity and dispersivity will be adjusted to improve the model fit.
g) Post processing of the model runs and calculating model fit statistics will be used to evaluate and present model output and findings in the form of text, tables, time-series plots, and maps.

9.3 Reactive Transport Model Development and Calibration

Similar to the approach for conservative constituents above, the development and calibration of the numerical reactive transport model will simulate the fate and transport of reactive constituents by adding the effect of chemical reactions in solute concentrations as sources or sinks in the governing equation. The numerical reactive transport model elements are provided below:

a) A chemical reaction network (CRN) will be established and defined to understand the way that constituents react chemically in their environment. The most important chemical reaction simulated for this study is the redox reaction that controls the existence of arsenic and manganese in a solid or aqueous phase. The mineral forms of arsenic and manganese will be considered, and the reductive environment will be examined that leads to mobilization of arsenic and manganese in the model domain area. Acid/base reactions may be considered, given the existence of the carbonate system in the system (e.g., hydroxide, carbonate, and bicarbonate). Reactive components and chemical reaction types will be defined in this stage.
b) Define the reactive transport model extent, which is smaller than the flow model domain

c) Define the temporal discretization of the numerical reactive transport model, which will be similar to or finer than temporal discretization for the transport model
d) Assign initial conditions of reactive components' concentrations at the start of the model simulation time.
e) Assign reactive components' concentrations to boundary conditions and sources with associated hydrologic features and water fluxes.
f) Assign reactive transport parameters such as rate coefficients and other parameters of kinetic chemical reactions and the equilibrium constant of the chemical reaction values based on literature values
g) Develop reactive transport model calibration and sensitivity targets and calibration criteria , with the focus on achieving a representative fit to measured water quality constituent concentrations and speciation data. Reactive transport parameters such as kinetic chemical reaction parameters will be adjusted to improve the model fit. Flow model parameters will be adjusted as necessary to achieve a better fit to measured constituents if necessary.
h) Post processing of the model runs will be used to evaluate and present model output and findings in the form of text, tables, time-series plots, and maps.

9.4 Model Development Documentation

The model development will be documented as a separate chapter within the overall Compliance Assessment Report.

Task 9 Deliverables:

- Calibrated flow model.
- Calibrated transport model.
- Calibrated reactive transport model for arsenic and manganese.
- Model development chapter for the Draft Compliance Assessment Report.

Task 10. Use Models to Assess Future Conditions

The calibrated flow, transport, and reactive transport models for arsenic and manganese will be used to assess the effects of RWRF operations on arsenic and manganese distribution and transport in the study area. The models, along with groundwater quality results from RWRF monitoring and offsite domestic and agricultural well sampling, will inform proposed locations to meet point of compliance requirements and identify any domestic wells that might be potentially affected by arsenic and manganese contributions due to RWRF operations. The modeling tools will also be used to assess potential groundwater quality considerations (e.g., arsenic, manganese, and in the future other constituents) in relation to changed RWRF operations (increased volume of effluent discharged to percolation ponds, modifications to reclamation well pumping, etc.) The estimated level of effort for this task is also based on the same considerations noted for Task 9 with regard to the geographic extent of the transport model and the number of constituents to be included.**10.1 Develop and Implement Scenarios**

A sufficient number of scenarios will be developed to demonstrate arsenic and manganese behavior under a plausible range potential RWRF operational practices. The focus of modeling will be to simulate conditions that are believed likely to occur rather than potential extremes in order to provide the most useful information for determining the points of compliance.

10.2 Evaluate and Process Results

The results of each scenario will be processed to develop maps, charts, and tables of model output data that can be directly used to assess the locations for points of compliance. Specifically, the model output must provide an evaluation of horizontal and vertical extent of the elevated arsenic and manganese and potential impacts of elevated concentrations on downgradient beneficial uses.

10.3 Model Applications Documentation

The model scenarios and processed results will be presented as a separate chapter within the overall Compliance Assessment Report.

Task 10 Deliverables:

- Processed results of model scenarios.
- Model application chapter for the Draft Compliance Assessment Report..

Task 11. Tier 2 Monitoring Well Network Evaluation

The City is implementing a two-tiered approach to the evaluation of the groundwater monitoring network for the RWRF. In Tier 1, documented in the Groundwater Monitoring Network and Well Installation Workplan, the City has completed an evaluation of the existing monitoring well network focused on meeting immediate monitoring needs identified by currently available data. Immediate needs addressed in Tier 1 include evaluating the need for replacement of wells that have gone dry, ensuring adequate monitoring upgradient and downgradient of all disposal ponds and surrounding restricted irrigation Use Areas, and filling of data gaps. The proposed new monitoring wells for Tier 1 are not specifically intended to demonstrate compliance with the groundwater limitations for arsenic and manganese.

The Arsenic and Manganese Groundwater Compliance Assessment will propose the wells to be designated as points of compliance in the Tier 2 analysis of the monitoring well network along with the statistical methods to be employed in the determination of compliance.

11.1. Well Network Evaluation

The Tier 2 evaluation of the monitoring well network will incorporate other, more complex considerations into the evaluation including fate and transport modeling of arsenic and manganese in groundwater and the results of both phases of domestic and agricultural well sampling. The primary goal of Tier 2 will be to identify monitoring locations to demonstrate compliance with the groundwater limitations for arsenic and manganese along with additional monitoring locations that may be needed to assess potential groundwater impacts attributable to RWRF operations and discharge.

The Tier 2 monitoring network evaluation will incorporate the results of sampling of domestic and agricultural wells in the vicinity of the RWRF. The flow and reactive transport modeling will improve the understanding of arsenic and manganese occurrence and movement in groundwater beneath and downgradient of the RWRF. This task will be completed concurrently with Task 10.

11.2. Identify Points of Compliance

The estimated point of compliance will be determined through the use of reactive transport modeling of arsenic and manganese occurrence and movement along with the results of sampling of domestic and agricultural wells in the vicinity of the RWRF. In order to meet the requirement of Provision J.1.a. that the distances of the proposed compliance monitoring well locations from the RWRF are as small as practicable, it is anticipated that new monitoring wells will be needed to serve as the points of compliance for arsenic and manganese. These new wells may be located downgradient of the RWRF to the southwest in relation to the existing and proposed Tier 1 monitoring well network. The actual number and locations of compliance monitoring wells will be determined through this analysis.

11.3. Statistical methods for compliance. The WDR requires the use of statistical data analysis methods specified in the USEPA's 2009 Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance (Unified Guidance) for evaluating compliance with the Groundwater Limitations of the WDR. The Unified Guidance provides a number of options for statistical tests that can be applied for determining compliance. Therefore, the Arsenic and Manganese Groundwater Compliance Assessment will include a statistical analysis approach that will propose the statistical strategy and design details to be used for determining compliance with the groundwater limits for arsenic and manganese. The Unified Guidance recommends the use of the lower confidence limit as the appropriate statistic of interest in compliance testing. The statistical analysis approach will propose the use of parametric or non-parametric tests along with the method for calculation of lower confidence limits.

11.4. Recommendations for Tier 2 Monitoring Well Network

Based on the outcomes of the Tier 2 evaluation of the monitoring well network and identified points of compliance, recommendations for the final groundwater monitoring network for arsenic and manganese compliance assessment will be developed. A map of the proposed monitoring well network will be prepared that shows the locations and depth zones of existing and proposed monitoring wells to be included in the network and the locations of new wells to be installed to meet monitoring objectives.

Deliverables:

- Map of Proposed Tier 2 Monitoring Network with Points of Compliance Designated
- Statistical analysis approach for Compliance Assessment (draft to be included in Compliance Assessment Report)
- Schedule for Completion of Work (schedule for installing monitoring wells as recommended by the As/Mn Assessment)

Task 12. Prepare As/Mn Groundwater Compliance Assessment Report

Carollo/LSCE will prepare and submit a final report documenting the activities, findings, and recommendations of the Groundwater Compliance Assessment. A draft and final report will be prepared. The report shall be prepared using current versions of Microsoft Office and GIS software. Copies of the final report shall incorporate City staff comments from the reviewed draft report.

12.1 Annual As/Mn Groundwater Compliance Assessment Progress Report

The WDR requires the annual submission of a technical progress report for the As/Mn Compliance Assessment with the first report due on February 1, 2021. Carollo/LSCE will prepare the first progress

report incorporating data collected through the third quarter of 2020 including available domestic and agricultural well data. The progress report will include an update on the preparation of the As/Mn Compliance Assessment as required by Task iii. of Provision J.1.a. of the WDR. Given the June 7, 2021 deadline for the full As/Mn Compliance Assessment Report, the first Progress Report is planned to be brief and focused on summarizing the offsite domestic and agricultural well sampling with recent data collected from RWRF monitoring wells and providing a status update for the Compliance Assessment.

12.2 Draft As/Mn Groundwater Compliance Assessment Report

Draft version of the As/Mn Compliance Assessment Report for City review.

12.3 Final As/Mn Groundwater Compliance Assessment Report

Final version of the As/Mn Compliance Assessment Report for submittal to the RWQCB.

12.4 Respond to RWQCB Comments

It is expected that a nominal effort may be needed to address and respond to any comments from the Board.

Deliverables:

- As/Mn Groundwater Compliance Assessment Annual Progress Report (PDF and 5 hard copies)
- Draft As/Mn Groundwater Compliance Assessment Report (PDF)
- Final As/Mn Groundwater Compliance Assessment Report (PDF and 5 hard copies)

Task 13. Project Management and Meetings.

Carollo's project manager shall direct and coordinate the efforts of the project team members in order to deliver all of the components of the project. Project management includes facilitation of a Kick-Off Meeting, periodic meetings, work order administration, monthly progress reports, coordination with RWRF staff, and quality management.

The project manager will make staffing assignments, review work progress, coordinate quality management procedures, manage subconsultants, and communicate monthly progress reports to the City. The project manager shall manage the budget, schedule, and invoicing. The project manager will prepare and maintain decision and action item logs that will record the decisions made by the City throughout the project as well as action items assigned to the Carollo/LSCE team and City team members.

13.1 Project Kickoff Meeting. Carollo/LSCE will facilitate a project Kick-off Meeting with RWRF staff to review the Workplan requirements and develop the City's goals and objectives for the As/Mn Compliance Assessment. This will be a working meeting with participation from key RWRF staff to discuss the RWRF goals and objectives, preferences, key concerns and project constraints. Additionally, Carollo/LSCE will review the overall scope, schedule, and budget, and establish lines of communication between the Carollo/LSCE team and RWRF staff. Carollo/LSCE will provide an initial data request list and list of past studies and work to review. The list will be updated during the course of the project. Key members of the Carollo/LSCE team will attend the Kick-Off Meeting.

13.2 Meetings with RWQCB. Two meetings will be held with the RWQCB.

The first meeting will be scheduled to review the results of Phase 2 domestic and agricultural well sampling, determine impacted domestic wells, and discuss potential corrective actions. This meeting will also include a presentation of the approach to flow and transport modeling to introduce modeling concepts and to familiarize the Board with the modeling tools and processes (modeling code, flow/transport model setup and calibration, approach to reactive transport) built into the models.

A second meeting will be to present the results of the flow and transport modeling and proposed points of compliance.

13.3 Progress meetings. Four progress meetings will be conducted. The progress meetings will be held at key project milestones to present interim results and obtain City feedback/approval on key decisions. It is assumed that meetings will alternate between Webex and in-person meetings (two Webex/two in-person).

PROJECT ASSUMPTIONS

1. The City shall furnish Carollo available studies, reports and other data pertinent to Carollo's services; obtain or authorize Carollo to obtain or provide additional reports and data as required; furnish to Carollo services of others required for the performance of Carollo's services hereunder, and Carollo shall be entitled to use and rely upon all such information and services provided by the City or others in performing Carollo's services under this Amendment.

2. Carollo has no control over the cost of labor, materials, equipment or services furnished by others, over the incoming water quality and/or quantity, or over the way City's plant and/or associated processes are operated and/or maintained. Data projections and estimates are based on Carollo's opinion based on experience and judgment. Carollo cannot and does not guarantee that actual costs and/or quantities realized will not vary from the data projections and estimates prepared by Carollo and Carollo will not be liable to and/or indemnify the City and/or any third party related to any inconsistencies between Carollo's data projections and estimates and actual costs and/or quantities realized by the City and/or any third party in the future, except to the extent such inaccuracies are caused by Carollo's negligent performance under this Amendment.

TIME OF PERFORMANCE

The work will be completed to meet the required As/Mn Compliance Assessment submittal date of June 7, 2021.

Estimated Project Delivery Schedule

The preliminary schedule for completing the tasks is provided in the table below assuming Notice to Proceed is received on March 1, 2020. The schedule is driven by the WDR completion deadline of June 7, 2021. The schedule is contingent on timely participation by the RWQCB to review the workplan submitted by the City to the RWQCB on December 10, 2019. The workplan provides initial findings from Phase 1 and establishes the technical approach for this project. The schedule also assumes timely participation and prompt feedback by the RWQCB during the two proposed meetings (Task 13.2).

Task	Task Duration (months)	Cumulative Duration (months)	Tentative Completion Date
Task 7. Evaluate Results of Domestic and Agricultural Well Sampling	9	9	
Task 8. Determine/Propose Corrective Actions	3	12	
Task 9. Develop Numerical Flow and Transport Models	9	9	
Task 10. Use Models to Assess Future Conditions	3	12	
Task 11. Tier 2 Monitoring Well Network Evaluation	4	14	
Task 12. Preparation of Compliance Assessment Report	6	15	6/7/2021
Task 13. Project Management and Meetings	15	--	

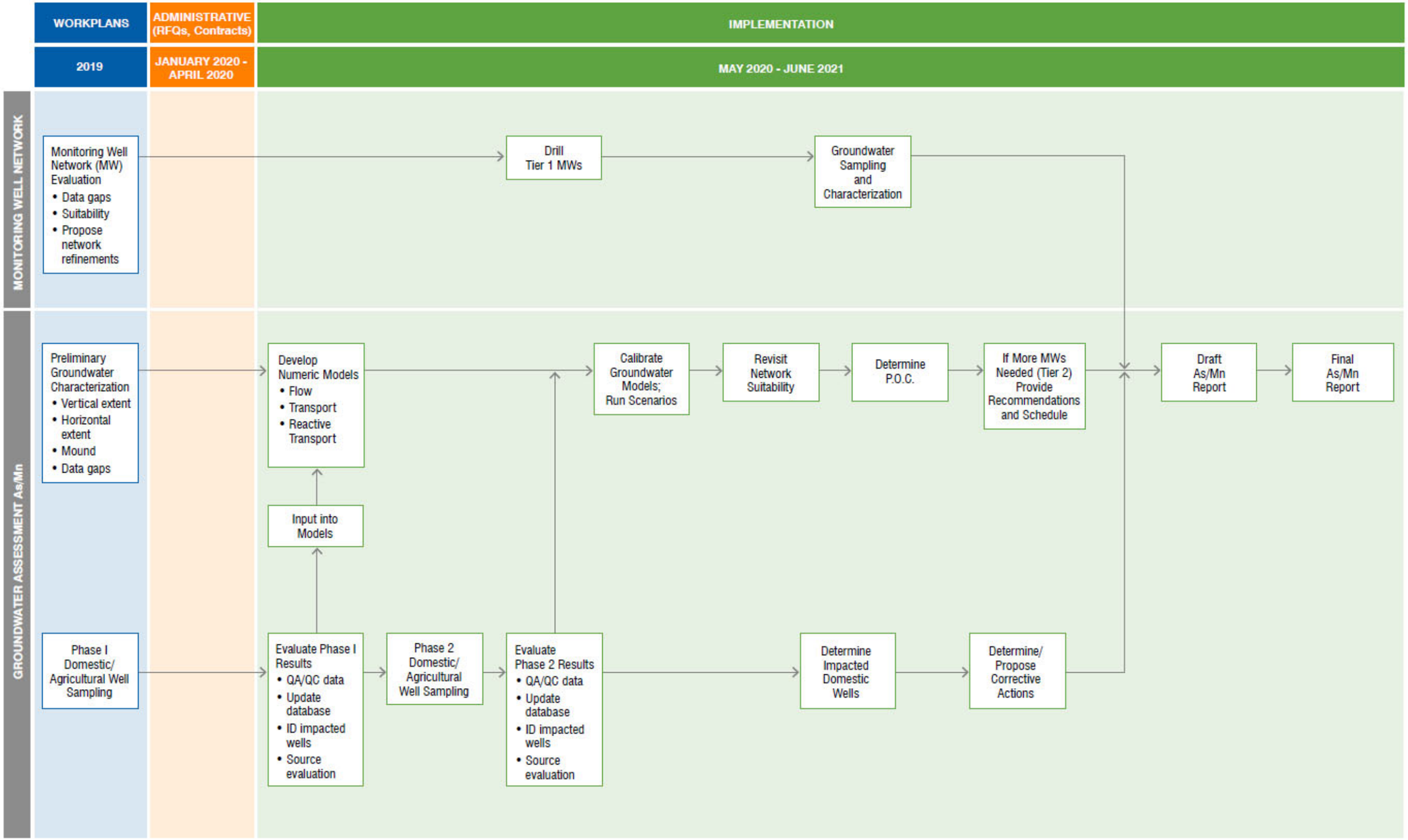

FIGURE 1 GROUNDWATER COMPLIANCE ASSESSMENT WORKFLOW DIAGRAM