

Appendix 7. Pre-Acceptance and Acceptance Testing Requirements

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APPENDIX 7

Pre-Acceptance and Acceptance Testing Requirements



7.1 PURPOSE

The purpose of this Appendix is to set forth the requirements for the pre-Acceptance Test and the Acceptance Test for the SRWA Regional Surface Water Supply Project (Project) pursuant to Article 5 (Testing, Start-Up, and Acceptance) of the Design-Build Contract (Contract). The purpose of the Acceptance Test is to demonstrate that the Project meets all design requirements and Performance Standards set forth in the Contract.

During startup and testing phase, the Startup and Testing Manager shall provide daily onsite leadership of commissioning activities and lead formal weekly meetings with SRWA to communicate progress of testing activities.

The following categories of requirements are described below:

- Staff Training Plan
- Staff Training Requirements
- Pre-Acceptance Test Plan
- Pre-Acceptance Testing
- Pre-Acceptance Test Report
- Acceptance Test Plan
- Acceptance Testing
- Acceptance Test Report

7.2 STAFF TRAINING PLAN

The Company shall prepare a Staff Training Plan describing all planned equipment, systems, and operational training activities. This section shall (at a minimum) include the following details:

- Training location(s)
- Listing of all proposed training sessions, including the anticipated length of each training session and whether the session covers maintenance or operations tasks, necessary to ensure that the Stanislaus Regional Water Authority's (SRWA's) operations staff are capable of fully operating the Regional Water Facilities without Company supervision or direct support. The Company-hosted training scope and durations (exclusive of equipment vendor and package systems trainings) shall be substantially similar to the training sessions, content and durations included in the Company's proposal.
- Training protocols, including details related to the Company's procedures for tracking the training activities
- Examples of classroom materials, samples, and handouts that will be provided

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- Details regarding the documentation that will be provided to the SRWA upon completion of all training activities and that meets the training reporting requirements listed in Section 7.3.5 (Staff Training Reporting Requirements) of this Appendix
- List of ongoing training to be provided to the SRWA operations staff by the Company throughout pre-Acceptance testing and Acceptance testing, and continuing until and up to thirty (30) days after the Acceptance Date

The Staff Training Plan shall be submitted a minimum of two hundred and seventy (270) days prior to the Company's initiation of pre-Acceptance testing activities.

7.3 STAFF TRAINING REQUIREMENTS

The Company shall provide all training for SRWA operations staff, such that SRWA staff is capable of fully operating the Regional Water Facilities without Company supervision or direct support.

7.3.1 General

The Company shall be responsible for scheduling, furnishing, and the cost of all training activities, including equipment required to present videos, slides, and other visual aids and the equipment to record training sessions onto digital media. Training, preferably delivered by manufacturers' representatives, shall be provided for individual pieces of equipment or manufactured systems. Training, preferably delivered by the Company's training team, shall be provided for complete systems and the Regional Water Facilities as a whole. The training venue(s) shall be the Water Treatment Plant (Plant).

If a system malfunction occurs during any training event, the training shall be suspended and resumed only after the system malfunction has been corrected by the Company. Any field or classroom training will only be considered complete if all provisions detailed in the Staff Training Plan and/or in the specific training session syllabi are met. Training not in compliance shall be performed again in its entirety by the Company at no extra cost to the SRWA. The Company must successfully complete all Staff Training activities in order to qualify for commencement of the Acceptance Test.

In addition to all scheduled training activities, SRWA operations staff shall be permitted to shadow the Company's certified operations staff while they are conducting any pre-Acceptance testing and Acceptance testing activities. The intent during Acceptance Testing is for the Company's operators to provide continued direction and guidance to SRWA O&M staff, including always having SRWA O&M staff do the actual 'button pushing' and 'valve turning' and gradually moving from directing SRWA to allowing SRWA staff make the decisions first with Company operations oversight. Coordination of these shadowing activities shall be made between the SRWA's Plant manager and the Company's Acceptance Test manager.

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The Company shall maintain commissioning, I&C, and engineering staff onsite through Acceptance Testing to be able to provide further insight into the design and systems operations as new questions or situations arise. The Company shall provide access to tools and off-site support for nuanced discussion of long-term process optimizations and atypical operational scenarios through the Acceptance Test.

7.3.2 Training Schedule Requirements

Staff Training may begin only after SRWA approval of the final Staff Training Plan. The Company shall schedule and conduct a training planning and coordination meeting ten (10) Business Days prior to the first anticipated training session. The Company shall notify the SRWA of the scheduled training sessions and the times they will be conducted and shall provide all training materials to the SRWA at least five (5) calendar days before commencement of each training event.

7.3.3 Staff Training Personnel

The Company shall train SRWA personnel on specific equipment and manufactured systems only with experienced manufacturers' representatives that are factory-trained and familiar with the various pieces of equipment and with giving both classroom and hands-on instructions.

Unless otherwise approved by the SRWA, each treatment process trainer shall be either a certified Grade V operator (in California or equivalent from another state), or a professional engineer with a minimum of fifteen (15) years of experience with a minimum of five (5) years of experience in training and startup activities for surface water treatment plants. A significant portion of the trainer's experience should include classroom and hands-on instruction, which includes providing instruction on the start-up and operation of similar facilities. All treatment process trainers are subject to SRWA approval.

7.3.4 Staff Training Procedures

The minimum field and classroom training requirements are as follows:

- Classroom and field training activities shall encompass no more than four (4) hours each, and no more than eight (8) hours in total, of a typical 8-hour work day
- Training instructors shall arrive at training sessions on time
- Brief rest breaks shall be scheduled and taken
- At least two (2) live training sessions shall be conducted for each topic to accommodate operational and staff scheduling needs
- Sufficient classroom materials, samples, and handouts shall be provided
- The Company shall maintain a log of classroom training including: instructors, topics, dates, time, and attendance
- All classroom training sessions shall be recorded on digital media. Electronic copies of the recordings shall be provided to the SRWA upon completion of given training events

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7.3.5 Staff Training Reporting Requirements

The Company is responsible for providing all of the documentation to the SRWA needed to demonstrate satisfactory achievement of all the training activities, as detailed in the Staff Training Plan that will be developed by the Company. Specifically, after all training has been completed, the Company shall submit to the SRWA one comprehensive training materials package that provides all the written materials from, and demonstrates adequate completion of, all staff training sessions identified in the Staff Training Plan. At a minimum, the following information shall be submitted:

- Logs of all classroom and field training sessions including: instructors, topics, dates, time, and attendance
- Training session syllabi and all instruction materials
- Electronic copies of recorded classroom training sessions

7.4 PRE-ACCEPTANCE TEST PLAN

Prior to conducting any of the testing activities described in this Appendix, the Company shall prepare and submit a Pre-Acceptance Test Plan for the SRWA's review and approval.

7.4.1 Submittal of Pre-Acceptance Test Plan

The Company shall prepare and submit to the SRWA for its acceptance a detailed Pre-Acceptance Test Plan, as described in this Section 7.4 of this Appendix. The Pre-Acceptance Test Plan shall be submitted a minimum of two hundred and seventy (270) days prior to the Company's initiation of pre-Acceptance testing activities. For each Pre-Acceptance Test Plan submittal, the SRWA shall have up to thirty (30) calendar days following receipt of the submittal to provide review comments to the Company. Pre-Acceptance testing shall not commence prior to the Company receiving SRWA acceptance, in writing, of the Pre-Acceptance Test Plan.

7.4.2 Pre-Acceptance Test Plan Requirements

The Pre-Acceptance Test Plan shall include the following:

- Detailed descriptions of the Company's plans for complying with all pre-Acceptance testing activities described in this Appendix
- Schedule of all pre-Acceptance testing activities to facilitate observation of testing activities by SRWA staff
- Description of how the Company will comply with the approved Operations and Maintenance (O&M) Manual (developed by the Company) and the Standard Operating Procedures (developed by the SRWA in consultation with the Company) throughout the planned pre-Acceptance testing activities
- Descriptions of the source(s) and quantities of water required for all pre-Acceptance testing activities, as well as the Company's plans for recirculating and/or disposing of any testing water

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All data generated and tracked by the Company during the pre-Acceptance testing and Acceptance testing activities must be made available for inspection by the SRWA and its representatives on a daily basis through the Project website. Such data includes, but is not limited to, the following: a commissioning tracking log to track the status and progress of commissioning activities; testing forms; correspondence; schedule updates; check lists; O&M manuals; photos; and training information.

7.5 PRE-ACCEPTANCE TESTING

The pre-Acceptance testing period shall precede the Acceptance Test. During the pre-Acceptance testing period each mechanical, electrical, and instrumentation component and system shall be tested to confirm and demonstrate compliance with the requirements of Appendix 5 (Project Technical Requirements). Testing shall occur in all modes of operation, including manual operation, automatic operation under programmable logic controller (PLC) control, and remote operation via the Project's supervisory control and data acquisition (SCADA) system. The Company shall be responsible for all chemical and electricity costs throughout the pre-Acceptance testing period. Pre-Acceptance testing is comprised of the following activities, at a minimum:

- Pre-Commissioning
- Component Testing
- Pressure and Leakage Testing
- Systems Testing
 - Mechanical Systems Testing
 - Electrical and Instrumentation Systems Testing
 - Hydraulic Systems Testing
- Process and Performance Testing
 - Tracer Testing (if performed – see Section 7.5.5.1)
 - Process Performance Verification for Selected Processes
 - Ozone System Challenge Testing
 - Loss-of-PLC Control Challenge Testing

Each of the above activities is described in further detail below.

7.5.1 Pre-Commissioning

Pre-commissioning shall consist of such early activities and quality assurance and quality control inspections necessary to ensure that components and systems are ready to commence pre-Acceptance testing in a safe and reliable manner.

7.5.2 Component Testing

Component testing shall consist of basic equipment inspections and testing completed under “dry” and “wet” conditions to establish proper connectivity, functionality, and operability, with a goal of confirming readiness to move to systems testing in “wet” conditions.

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7.5.3 Pressure and Leakage Testing

Pressure and leakage tests shall be conducted for all pipelines and water-containing structures in accordance with applicable portions of Appendices 4 (Design-Build Quality Management) and 5 (Project Technical Requirements) and shall be completed prior to mechanical systems testing of any connected mechanical equipment or valves.

7.5.4 Systems Testing

During systems testing, individual process units and systems shall be independently evaluated in a wet environment (i.e., in an environment similar to normal operating conditions) to confirm basic functionality and that controls are performing as designed. Following completion of testing of each system, the entire Project shall be tested in the same manner, including PLC and SCADA control systems testing. Additional systems testing requirements are described below.

7.5.4.1 Mechanical Systems Testing

Mechanical systems testing shall include:

- Startup and initial operation of major equipment in the presence of and with the assistance of the manufacturer's representative
- Verification that equipment is capable of operating correctly in manual, automatic and remote modes, and that alarms and control setpoints are properly established
- Checking of rotating machinery for correct direction of rotation and for freedom of movement
- Testing of rotating machinery, motors, and variable frequency drives (VFDs) to verify acceptable equipment performance over the full range of operating conditions, including, but not limited to, conditions for head, flow, pressure, capacity, and speed

7.5.4.2 Electrical and Instrumentation Systems Testing

The Company shall engage and pay for the services of a qualified third party independent testing firm for the purpose of performing certain inspections and tests as outlined below. The independent testing firm shall not be affiliated in any way with the Company. Prior to starting electrical and instrumentation systems testing, the Company shall submit detailed field test procedures and test forms along with the name of the independent testing firm and resumes of person(s) to perform tests for the SRWA's review and approval.

Electrical and instrumentation systems testing shall include:

- Pre-energization testing of equipment prior to powering equipment. Conduct the following pre-energization tests:
 - Visual inspection and recording of motor nameplate data
 - Torque Connections
 - Wire Insulation and Continuity Tests
 - Grounding System Tests

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- Panelboard Tests
- CAT6 and Fiber Testing: Every Fiber Optic cabling link in the installation shall be tested in accordance with the field test specifications defined in American National Standards Institute/Telecommunications Industry Association (ANSI/TIA)-568-C.2 “Commercial Balanced Twisted-Pair Telecommunications Cabling and Components Standard”
- Conducting field calibration, loop acceptance, and end-to-end testing
- Conducting phase rotation and motor testing. Verifying proper phase rotation and documenting amperage drawing and voltage balance for all motors
- Calibrate instruments and make required adjustments and control point settings
- Energizing transmitting and control signal systems; verify proper operation, ranges and settings
- Demonstrating proper operation of each instrument loop function including alarms, local and remote controls, instrumentation, and other equipment functions
- Generating signals with test equipment to simulate operating conditions in each control mode

7.5.4.3 Hydraulic Testing

Hydraulic testing shall include:

- Operation of the Raw Water Pump Station and each pump at maximum design capacity for a minimum of four (4) hours
- Operation of any Plant intermediate pump station(s) and each pump at its maximum design capacity for four (4) hours
- Operation of the Finished Water Pumping Station(s) and each pump at maximum design capacity for a minimum of four (4) hours
- The ability of all components of the Project to meet the design hydraulic capacity for a 4-hour period (i.e., hydraulic testing)

7.5.5 Process and Performance Testing

During process and performance testing, individual units shall be evaluated while operating the full treatment train to confirm that treatment facilities and controls are functioning as designed. A treatment process engineer shall be onsite during the Acceptance Test and engaged throughout the process and performance testing. Additional, process-specific testing requirements are described below.

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7.5.5.1 Tracer Testing

If the Company utilizes baffle factors higher than those initially allowed by the Division of Drinking Water (DDW) in accordance with Sections 5.2.4.5 (Primary Disinfection) and 5.2.4.7 (Final Disinfection and Clearwell Storage) of Appendix 5, the Company shall perform tracer testing during pre-Acceptance Testing in accordance with the following paragraphs. If the Company utilizes the baffle factors initially allowed by DDW in accordance with Appendix 5, the requirements of this section may be ignored.

In order to determine applicable baffle factors (T_{10}/T) required for Concentration-Time (CT) disinfection calculations, the Company shall prepare a tracer test plan at the Plant's rated capacity through the ozone contactors, chlorine contact basins (if provided), and clearwells. The tracer test plan must comply with applicable DDW standards and procedures. The Company shall submit the proposed plan for review and approval by the SRWA and DDW. The Company then shall conduct the tracer test in accordance with the test plan as approved by the SRWA and DDW. For the ozone contactors, tracer concentration shall be measured at each of the liquid-phase ozone residual monitoring locations through the contactor as well as the exit of the contactor. The final baffling factor must be approved by DDW and shall be a pre-condition of the Acceptance Test.

7.5.5.2 Process Performance Verification for Selected Processes

Compliance with selected process performance design criteria specified in Appendix 5 (Project Technical Requirements) shall be demonstrated during pre-Acceptance testing. Such testing shall include demonstration of the following design criteria at the Plant's rated capacity:

- Primary Disinfection (Ozone):
 - Delivery of design ozone dose
 - Ozone transfer efficiency
 - Ability of the quenching system to effectively quench ozone residual at the exit of the ozone contactors, while operating at the design ozone dose
- Filtration:
 - Minimum unit filter run volume
 - Individual Filter Effluent (IFE) turbidities and Combined Filter Effluent (CFE) turbidity
- Finished Water Quality:
 - Continuous measurement of Finished Water pH and free chlorine residual (leaving the Plant)
 - Continuous measurement of Finished Water turbidity to confirm the turbidity increase after lime addition does not exceed the design requirements as specified in Appendix 5 (Project Technical Requirements)

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Unless otherwise stated, demonstration of process performance shall require a minimum of twenty-four (24) hours of continuous acceptable performance for each of the above processes and criteria. If any design criteria confirmation testing fails, the Company shall take or implement appropriate corrective actions or modifications to rectify the cause of the failure and then re-conduct the testing at time zero.

The Company, may, at its discretion, perform the testing described above during the Acceptance Test, prior to the start of variable production testing described in Section 7.8.3.2 of this Appendix.

7.5.5.3 Ozone System Challenge Testing

The Company shall demonstrate operational controls of the ozone system and required pathogen treatment when operating the system at three different performance ratios at the Plant's rated capacity. The performance ratio is defined as the measured disinfection credit (log removal) divided by the target disinfection credit. This includes documenting that the ozone system can automatically adjust to water quality variability to continuously meet the specified log removal value (LRV) performance ratio at the ozone system efficiency (i.e., design ozone concentration, power requirements, and mass transfer efficiency) designated in Appendix 5 (Project Technical Requirements) and the Secondary Technical Criteria throughout each of the three performance ratios.

Each performance ratio shall be tested continuously at the Plant's rated capacity for a minimum of six (6) hours. The minimum, maximum, average, median LRV for both *Giardia* and viruses, and standard deviation from the target shall be reported for each 6-hour test.

7.5.5.4 Loss-of-PLC Control Challenge Testing

The Company shall demonstrate the Project's ability to continue producing Finished Water in the event of PLC outages at selected facilities. To simulate the loss of PLC control for a given facility, the Company shall de-energize the controlling PLC in a manner that completely eliminates PLC control for the subject facility and transition to manual operation for a minimum of four (4) hours. Only one process area shall be removed from PLC control at a time. Loss-of-PLC control challenge testing shall be conducted for each of the following facilities:

- Clarification
- Primary Disinfection
- Filtration
- Residual Disinfection and Clearwells
- Finished Water Pumping

Loss-of-PLC control challenge testing may be conducted prior to the production and delivery of drinking water (e.g., while the Plant is recirculating water).

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7.6 PRE-ACCEPTANCE TEST REPORT

Within twenty (20) calendar days of completing pre-Acceptance testing, the Company shall submit a Pre-Acceptance Test Report certifying that all systems have been successfully tested and have demonstrated satisfactory performance, meeting all performance criteria established in the approved Pre-Acceptance Test Plan. This Pre-Acceptance Test Report shall include summary tables, graphs, and other presentation of test results as needed to demonstrate that each unit process met all performance standards for the required test duration, as established in the approved Pre-Acceptance Test Plan. Additional results from the pre-Acceptance testing activities to be included in the Pre-Acceptance Test Report shall include the following:

- Certification of acceptable performance, as required by Appendix 5 (Project Technical Requirements), of all mechanical, electrical and instrumentation systems
- Hydraulic test results
- Tracer test results (if performed – see Section 7.5.5.1 [Tracer Testing]); results shall be signed and sealed by a registered Professional Engineer in the State of California
- Process performance design criteria performance test results
- Ozone system challenge test results
- Loss-of-PLC control challenge test results

This Pre-Acceptance Test Report shall be certified as true, complete and correct by the Company and its Engineer.

7.7 ACCEPTANCE TEST PLAN

The Company shall prepare an Acceptance Test Plan that describes in detail the procedures for all Acceptance testing activities and provides the necessary checklist and forms for performing and tracking this work. The Acceptance Test Plan shall describe all operating procedures, clearly indicating that all equipment and systems are capable of and shall be operated as intended within established operating boundaries as defined in Appendix 5 (Project Technical Requirements). All portions of the Acceptance Test shall be conducted at flow rates between the minimum Plant capacity and the Plant's design capacity, as specified in Appendix 5.

7.7.1 Submittal of Acceptance Test Plan

The Company shall prepare and submit to the SRWA for its review and approval a detailed Acceptance Test Plan as required pursuant to this Appendix and Section 5.3(A) (Submittal of Acceptance Test Plan) of the Contract. The Acceptance Test Plan shall be submitted a minimum of two hundred and seventy (270) days prior to the Company's initiation of Acceptance testing activities. For each Acceptance Test Plan submittal, until SRWA approval of the Acceptance Test Plan, the SRWA shall have thirty (30) calendar days following receipt of the Acceptance Test Plan to provide review comments to the Company. Acceptance testing shall not commence prior to the Company receiving SRWA approval, in writing, of the Acceptance Test Plan.

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7.7.2 Acceptance Test Plan Requirements

The Acceptance Test Plan shall include the following:

- Detailed description of the Company's approach to meeting the requirements of the Contract, this Appendix, and the Interim Operations Approval, including testing of all treatment, conveyance, monitoring and control systems.
- Proposed Acceptance Test schedule.
- Procedures for determining that all Finished Water is in compliance with Applicable Law and Additional Finished Water Quality Standards specified in Appendix 6 (Performance Standards).
- Procedures for preventing any non-potable water from entering the City of Ceres and City of Turlock (Cities) Water Supply Systems, including operating procedures for performing the Acceptance Test at minimum Clearwells level.
- Procedures for the disposal of partially treated water or Finished Water not in compliance with Applicable Law. Include drawings and diagrams depicting the diversion of water to the Ceres Main Canal and provide technical details for all temporary equipment required to facilitate such diversions. At a minimum, such details shall address: temporary pumping, piping and valving equipment; temporary chemical storage addition facilities; and temporary instrumentation, such as flow meters, water quality analyzers, pressure indication, level indication, and valve or gate position indication.
- Procedures for producing Finished Water at SRWA-specified production rates during the Acceptance Test.
- Procedures for delivering Finished Water to the Points of Interconnection on a schedule designated by the SRWA and for the disposal of Finished Water produced in excess of the volumes requested by the Cities during Acceptance testing. Each City will prepare a surface water integration plan that will address the introduction of Finished Water into the City Water Supply Systems, the ramp up of flows over time, and other matters relating to the introduction of surface water into the City groundwater-based systems. The Acceptance Test Plan shall incorporate, implement, and comply with the City-prepared integration plans.
- Procedures for testing the standby power capabilities of the Project, including operation of the Plant, the Raw Water Pump Station, and Finished Water Pump Station, on standby power.
- List of all necessary permanent and temporary monitoring and testing equipment needed to support the Acceptance Test. The listed equipment shall be on-site and functioning prior to the start of the Acceptance Test.

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- Organization (in consultation and collaboration with the SRWA) of an Acceptance testing team to assist with and monitor the Acceptance Test. The testing team shall consist of appropriate representatives from the Company and SRWA and the final team composition shall be subject to the review and approval of the SRWA. The plan shall describe the testing team responsibilities, authority, and decision-making protocols. A contact list of the Acceptance testing team shall be prepared, including phone numbers that can be used to reach members of the team 24/7 in case of emergencies or unexpected conditions.
- Staffing plan for normal operations of the Project, which must be consistent with the O&M labor and staffing assumptions in the Request for Proposals and the Company Proposal. The plan shall include Acceptance Test period coordination and communication with SRWA operations staff, which must, in accordance with Applicable Law, be responsible for operating the Project when Finished Water is delivered to the City Water Supply Systems.
- Procedures for demonstrating compliance with all Acceptance Test Standards set forth in this Appendix, including but not limited to:
 - Response and re-testing procedures for unsuccessful test results, including definition of threshold results that constitute failure of the Acceptance Test
 - Internal and external communications protocols
 - Forms for tracking individual unit process performance
 - Forms for tracking electrical demand and utilization
- Operating and maintenance schedule during the Acceptance Test Period.
- Planned operating conditions for the Raw Water Pump Station, the Plant, and the Finished Water Pumping Station(s), including but not limited to the numbers of pumps and unit processes on-line, proposed chemical doses, and loading rates for treatment unit processes.
- SCADA system monitoring and control functions along with a list of real-time fields that shall be captured during the Acceptance Test.
- Procedures for testing the Project's cathodic protection systems.
- Procedures for demonstrating compliance with Applicable Law and Additional Finished Water Quality Standards as specified in Appendix 6 (Performance Standards), including:
 - A list of all parameters to be monitored and measurements to be made, including but not limited to: Raw Water, partially treated water, and Finished Water quality; flow rates; and pressures.
 - A list of sampling/monitoring frequencies compliant with the minimum requirements set forth in Section 7.8.7 (Water Quality Monitoring Requirements during Acceptance Testing) of this Appendix.
 - A complete list of sampling protocols to be utilized during the Acceptance Test.

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- Identification and qualifications of the State-certified independent laboratory(s) proposed to be used for all off-site water quality analyses. Use of the proposed third-party State-certified laboratory shall not commence without the SRWA’s written approval.
- A complete list of all analytical methods and laboratory Quality Assurance and Quality Control (QA/QC) practices that will be utilized at both the on-site laboratory and State-certified contract laboratory, including identification of which analyses are to be made at the on-site laboratory and the State-certified contract laboratory. Only DDW-approved analytical method, or United States Environmental Protection Agency (U.S. EPA)-approved methods if DDW approved methods are not available, shall be used during Acceptance testing. The Acceptance Test Plan shall also list associated Minimum Detection Limits (MDLs) for all on-site and State-certified laboratory water quality analyses. All MDLs shall be lower than regulatory DDW-required detection limits for reporting (DLR) or below MCLs, DDW drinking water notification levels, and Additional Finished Water Quality Standards where DLRs are not available.
- Identification of equipment calibrations to be performed, descriptions of all calibration techniques to be used and timing of calibrations relative to the Acceptance Test (all instruments, including benchtop units, used in the Acceptance Test operations and to monitor and evaluate the Acceptance Test shall be calibrated in accordance with manufacturer’s requirements), QA/QC procedures, including those to be utilized for all equipment used for testing and measuring different parameters within the treatment process and at the in-house laboratory. The description of calibration practices shall include frequency and accuracy requirements. The calibration procedures shall consider intermediate spot and cross checks with secondary standards in addition to the formal calibration periods.
- Descriptions of how all data collected during Acceptance testing will be compared with Appendix 6 (Performance Standards). This data and Performance Standards comparison shall be conducted in a manner that complies with SRWA and regulatory requirements including applicable data handling requirements of DDW. Examples shall be provided for all data presentation methods and evaluation techniques that will be utilized.
- A protocol for delivering samples to the SRWA for the SRWA’s own testing program, should the SRWA elect to have such a program during the Acceptance Test.

Preliminary tests not required as part of pre-Acceptance testing activities may be conducted at the Company’s expense prior to the start of Acceptance testing. The results of such preliminary tests shall not be made part of the Acceptance Test Plan or Report.

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7.8 ACCEPTANCE TESTING

7.8.1 Notice of Commencement of the Acceptance Test

The Company shall provide the SRWA with written notice of the expected initiation of the Acceptance Test in accordance with the timing requirements of Section 5.3(B) (Notice of Commencement of the Acceptance Tests) of the Contract. Prior to the actual commencement of the Acceptance Test, the Company shall certify in writing that it is ready to begin the Acceptance Test in accordance with the Section 5.3(B) (Notice of Commencement of the Acceptance Tests) of the Contract, the approved Acceptance Test Plan, and this Appendix.

7.8.2 Conditions to Commencement of the Acceptance Test

The Company shall not commence the Acceptance Test until the events and conditions set forth below have occurred or been satisfied. Prior to commencement of the Acceptance Test, the Company shall prepare and submit to the SRWA certification that all of these events and conditions have occurred or been satisfied.

1. The requirements of Sections 5.3(A) (Submittal of Acceptance Test Plan) and 5.3(B) (Notice of Commencement of the Acceptance Tests) of the Contract have been met and the SRWA has approved the Acceptance Test Plan
2. If required by Applicable Law, DDW has approved the Acceptance Test Plan proposed by the Company and approved by the SRWA
3. Substantial Completion has occurred as specified in Section 4.21 (Substantial Completion) of the Contract
4. A New Domestic Water Supply Permit or an Interim Operations Approval has been issued by DDW, and contains sufficient authorization to permit the planned Acceptance Test and post-Acceptance Test operations (including the delivery of Finished Water to the City Water Supply Systems)
5. Waste Discharge Requirements have been issued by the Regional Water Quality Control Board to allow discharge of Raw Water, partially treated water, or Finished Water produced during pre-Acceptance testing and Acceptance testing (and that is not delivered to the City Water Supply Systems) to the Turlock Irrigation District (TID) Ceres Main Canal
6. The Company has certified that it has complied with the pre-Acceptance testing requirements of this Appendix
7. Training of SRWA operators, as required to ensure the SRWA's operations staff are capable of fully operating the Regional Water Facilities without Company supervision or direct support, has been satisfactorily commended in accordance with Section 5.9 (Operations Training by Company) of the Contract and Section 7.3 (Staff Training Requirements) of this Appendix

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7.8.3 Acceptance Test Period

During the Acceptance Test period, the Company shall demonstrate the Project's full and continuous compliance with the Performance Standards. The Acceptance Test duration shall be of sufficient length to satisfy all of the testing requirements specified in this Appendix and the approved Acceptance Test Plan but shall have a minimum duration of twenty (20) consecutive 24-hour periods. Each 24-hour period of the Acceptance Test shall begin at a convenient, recurring time that is mutually agreeable to the Company and SRWA. The SRWA and its representatives shall have the right to observe the Acceptance Test. The Company shall be responsible for all chemical and electricity costs throughout the Acceptance Test period.

A treatment process engineer shall be onsite for the duration of the Acceptance Test period.

The Acceptance Test shall be comprised of the following three periods, described in further detail below:

- Chlorine Disinfection System Challenge Testing
- Variable Production Testing
- Continuous Production Testing

7.8.3.1 Chlorine Disinfection Systems Challenge Testing

The Chlorine Disinfection Systems Challenge Test shall be completed if required by DDW. If DDW waives demonstration of the emergency disinfection system based on CT calculation, then the Chlorine Disinfection Systems Challenge Test requirement will be waived.

During the Chlorine Disinfection Systems Challenge Testing period, the Company shall demonstrate full and continuous compliance with Applicable Law and the Performance Standards while operating the Plant with the primary disinfection system off-line. Chlorine Disinfection Systems Challenge Testing shall occur at the Plant's design Finished Water production rate. Notwithstanding the requirements of Section 7.8.9 (Failure of the Acceptance Test) of this Appendix, the Chlorine Disinfection Systems Challenge Testing period shall last a minimum of 24 consecutive hours. This Chlorine Disinfection System Challenge Test shall include (a) the clearwell from the point of chlorine addition to the point of chlorine residual measurement at the Finished Water Pump Station and (b) the Finished Water Transmission Main to each City from the point of Finished Water Pump Station to the point of chlorine residual measurement near the Points of Interconnection. This test must be completed before the Cities begin delivering water to their distribution systems.

Chlorine Disinfection Systems Challenge Testing must be completed satisfactorily prior to advancing to the Variable Production Testing and Continuous Production Testing periods. During Chlorine Disinfection Systems Challenge Testing, all Finished Water shall be diverted to TID's canal system as close to the Points of Interconnection as possible and may not be introduced into the City Water Supply Systems.

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During the Chlorine Disinfection Systems Challenge Testing, the Company shall record the following parameters via grab samples every 15 minutes or continuously with portable analyzers, as appropriate, to support calculation of the minimum, maximum, median and average pathogen inactivation for *Giardia* and viruses:

- Water depth and basin volume of the clearwell and flow rate through each Transmission Main in which free chlorine disinfection occurs
- Residual chlorine concentration at the exit of the clearwell and end of each Transmission Main where CT compliance is calculated
- pH at the exit of the clearwell and end of each Transmission Main where CT compliance is calculated
- Temperature at the exit of each clearwell and end of each Transmission Main
- All other parameters or conditions deemed necessary by DDW for calculation of pathogen inactivation per Applicable Law

7.8.3.2 Variable Production Testing

During the Variable Production Testing period, the Company shall demonstrate full and continuous compliance with Applicable Law and the Performance Standards while operating the Project over the range of Finished Water production rates specified in Appendix 5 (Project Technical Requirements), and as directed by the SRWA. The SRWA shall provide the Company with notice a minimum of 24 hours, but not more than 48 hours, in advance of all Finished Water production rate changes during the Variable Production Testing period. Changes to Finished Water production rates may result in an increase or decrease of the prior rate requested by the SRWA. A maximum of two (2) changes to Finished Water production rates may be requested by the SRWA during any 24-hour period.

Throughout the Variable Production Testing period, the following additional testing shall take place:

- Chemical consumption testing shall be performed to demonstrate compliance with the chemical consumption standards, as described in Appendix 6 (Performance Standards). Measurements of chemical consumption for all chemical metering systems shall be accomplished using monitored feed rate data tracked by the Project's SCADA historian.

Notwithstanding the requirements of Section 7.8.9 (Failure of the Acceptance Test) of this Appendix, the Variable Production Testing period shall last a minimum of five (5) consecutive 24-hour periods.

7.8.3.3 Continuous Production Testing

During the Continuous Production Testing period, the Company shall demonstrate full and continuous compliance with Applicable Law and the Performance Standards while operating the Project at the design Finished Water production capacity specified in Appendix 5 (Project Technical Requirements).

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The Continuous Production Testing period shall follow satisfactory completion of the Variable Production Testing period. Notwithstanding the requirements of Section 7.8.9 (Failure of the Acceptance Test) of this Appendix, the Continuous Production Testing period shall last a minimum of twelve (12) consecutive 24-hour periods.

During the Continuous Production Testing period, the following additional testing shall take place:

- Environmental testing shall be performed to demonstrate compliance with the Noise Control and Outdoor Lighting Requirements, as described in Appendix 6 (Performance Standards), over three (3) 24-hour periods

7.8.4 Acceptance Test Coordination Meetings and Daily Reporting Requirements

The Company shall conduct a daily coordination meeting prior to the start of each 24-hour period of the Acceptance Test. In addition to the Company, meeting attendees may include, but are not limited to, representatives of the SRWA, the City of Ceres, the City of Turlock, TID, the SRWA's Engineer, and the SRWA's Construction Manager. At these meetings the group will discuss any issues or complaints within the Cities' distribution systems. The Company will support the Cities in identifying any root causes and develop a plan to rectify the situation.

Prior to the start of each coordination meeting, the Company shall prepare and submit to the SRWA a summary of planned testing activities. Such summaries shall include:

- The planned Finished Water production rate
- The planned Finished Water delivery rates to each of the Cities (based on SRWA direction)
- The planned Finished Water quality setpoints for each of the Cities for pH, chlorine residual and corrosion inhibitor (dictated by each of the Cities through the SRWA)
- Any plans for special testing activities

Within 24 hours of the conclusion of each 24-hour period of the Acceptance Test, the Company shall submit to the SRWA a daily report. Each daily report shall include the following:

- Name of the Company representative responsible for the daily report
- List of attachments
- Staff present on-site, including SRWA and Company staff
- Summary of Raw Water quality sampling results, including comparisons to Uncontrollable Circumstance Relief conditions defined in Appendix 6 (Performance Standards)
- Summary of Finished Water quality sampling results, including comparisons to Performance Standards
- Summary of recycle flow rates as a percentage of Finished Water production

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- Summaries of continuous monitoring results for each unit process at the Plant, including control methods and setpoints, lists of required documentation and/or trends, narrative descriptions of any anomalies in data or performance, and time-varying charts displaying performance data throughout the 24-hour testing period

Within 24 hours of the SRWA's receipt of each daily report, the SRWA will prepare and submit written review comments.

7.8.5 Discharge of Finished Water During Acceptance Test Period

Except as otherwise provided in this Appendix, the Finished Water shall be delivered to the Points of Interconnection throughout the Acceptance Test period, in accordance with the Finished Water production schedule, as specified by the SRWA, as set forth in the approved Acceptance Test Plan, and in accordance with Section 5.4 (Water Deliveries During Acceptance Test and Prior to Acceptance) of the Contract. However, if either City or DDW determines that the delivery of Finished Water to the Points of Interconnection results in adverse impacts to the City Water Supply System(s) at any time during the Acceptance Test, the SRWA may direct the Company to temporarily adjust or cease deliveries to the Points of Interconnection or a Point of Interconnection. Such temporary adjustments or cessations may result in Finished Water delivery rates during the Acceptance Test that range from 0 to 5 MGD for Ceres, and from 0 to 10 MGD for Turlock.

Unless otherwise approved by the SRWA, Finished Water produced by the Project in excess of the volumes established for delivery to the Cities, and/or Finished Water that does not meet Applicable Law or the Performance Standards shall be diverted to the TID Ceres Main Canal or other location(s) approved by TID. Any discharges to the TID Ceres Main Canal shall be in compliance with the applicable Waste Discharge Requirements and other Government Approvals and utility coordination requirements described in Appendix 9 (Government Approvals, Utilities, and Landowner Coordination).

7.8.6 Acceptance Test Standards

The ability of the Project to satisfactorily meet and comply with the following Acceptance Test Standards shall be demonstrated by the Company during the Acceptance Test:

- Compliance with Applicable Law, all Performance Standards (Appendix 6), and all applicable Governmental Approvals at all times.
- The ability of the Raw Water Pump Station to operate at its full range of delivery Flow Rates described in Appendix 5 (Project Technical Requirements).
- The ability to deliver Finished Water at Flow Rates in accordance with Section 7.8.3 (Acceptance Test Period) of this Appendix, which may be equal to or less than the design capacity of the Project.

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- The ability of the Project to deliver Finished Water with separate, City-specified concentrations of alkalinity, pH and/or Langelier Saturation Index (LSI), total chlorine residual, and calcium to each of the two Points of Interconnection. The SRWA, on behalf of the Cities, shall have the right to modify the target concentration for these parameters in the Finished Water delivered to each of the Cities no more than once in any 24-hour period during the Acceptance Test, and the Company shall be responsible for meeting the changed concentrations.
- The ability of the Project to continue to produce an uninterrupted supply of Finished Water at the Project's design capacity and deliver Finished Water to the Points of Interconnection without primary power supply.
- The ability of the Project to be operated under normal conditions consistent with the staffing plan part of the approved Acceptance Test Plan, which must be consistent with the operations and maintenance labor and staffing assumptions in the Request for Proposals and the Company Proposal, with the exception of additional Company staffing required for the collection and analysis of samples and other test data during the Acceptance Test.
- The proper function of the Project upon loss of power, loss of control systems, manual startup and shutdown, and automatic shutdown.
- Operation of equipment over the full range of operating capabilities with all components free from cavitation and excessive vibration.
- Successful performance of hydraulic testing.
- The solids handling systems function as intended.
- The chemical systems function as intended.
- The monitoring, instrumentation, and automated control systems function as intended without interruption, notwithstanding the requirements of Section 7.5.5.4 (Loss-of-PLC Control Challenge Testing) of this Appendix.

Water quality testing of Raw Water, partially treated water, and Finished Water shall be performed in accordance with the Acceptance Test Plan and this Appendix.

7.8.7 Water Quality Monitoring Requirements during Acceptance Testing

During the Acceptance Test period, the Company shall regularly monitor the Raw Water, partially treated water, and Finished Water for key water quality parameters, as specified in Tables 7-1 and 7-2, to evaluate the performance of the Project. The minimum monitoring frequency during Acceptance testing for these key parameters is also specified in Tables 7-1 and 7-2.

In addition, the Company shall collect grab samples a minimum of once per day from all locations where continuous monitoring instrumentation is installed (including, but not limited to: temperature, turbidity, pH, alkalinity, ozone residual, and total chlorine residual) and analyze the samples with a benchtop analyzer to confirm on-line instrumentation readings.

Table 7-1. Minimum Monitoring Requirements during the Acceptance Test for Constituents with Applicable Law Standards and Additional Finished Water Quality Standards^(h)

Parameter	Units	Point of Performance Measurement	Sampling Frequency during Acceptance Testing	Compliance Monitoring Period ^(a)	
Constituents with Applicable Law Standards	Varies		3 samples ^(g)	Each sample	
Turbidity	Milligrams per liter (mg/L)	Comply with 40 C.F.R §141.718, Treatment performance toolbox component (1) Combined Filter Performance, (2) Individual Filter Performance			
Total Organic Carbon (TOC)	mg/L	(i)	Daily	N/A	
Total Trihalomethanes (TTHMs) ^(b)	mg/L	Refer to Table 6-2 of Appendix 6 (Performance Standards)	Every 4 days	(c)	
Five Haloacetic Acids (HAA ₅) ^(b)	mg/L		Every 4 days	(c)	
Bromate	mg/L		Every 4 days	(c)	
Manganese, total	mg/L		Every day	Each sample	
Iron, total	mg/L		Every 2 days	Each sample	
Aluminum, total	mg/L		Every 2 days	Each sample	
Pathogen Treatment	LRV		As required by State and Federal regulations		
Free Chlorine Residual	mg/L as Cl ₂		Every 15 minutes ^(d)	Daily	
Finished Water pH	pH units		Every 15 minutes ^(d)	Daily	
LSI	--		Calculated daily	Weekly	
Alkalinity, total	mg/L as CaCO ₃		Daily	Weekly	
Calcium	mg/L as Ca		Daily	Weekly	
Methylisoborneol (MIB), Geosmin ^(f)	Nanograms per liter (ng/L)		Only if requested by the SRWA	Each sample	
Recycle Flow	Percent of Finished Water Flow		Every 15 minutes ^(d)	Daily	
Recycle Turbidity	Nephelometric Turbidity Unit (NTU)		Every 15 minutes ^(d)	Daily	

- (a) Compliance with the required concentrations specified in Appendix 6 (Performance Standards) during Acceptance Testing is based on the average of all samples taken during the Compliance Monitoring Period specified herein, except for total chlorine residual, pH, and LSI. Compliance with specified concentrations for total chlorine residual, pH and LSI shall be based on the median, rather than the average, of samples taken during the Compliance Monitoring Period.
- (b) TTHM and HAA₅ concentrations shall be determined using the Simulated Distribution System Disinfection Byproduct (SDSDBP) test method in Standard Methods (Method 5710C). Samples of Finished Water pumped to each City's Point of Interconnection shall be collected, with no adjustment of chlorine residual or pH, and held at the temperature of the Finished Water at the time of collection (±2°C) for a 96-hour holding time. Each City shall independently specify the chlorine residual and pH for Finished Water delivered to its Point of Interconnection, which requires that separate SDSDBP samples are collected for each City.
- (c) Average of all tests during Acceptance Testing.
- (d) For a specified sampling frequency of 15 minutes, the Company shall utilize continuous monitoring equipment with data recorded at least once every 15 minutes.
- (e) Not used.
- (f) Samples for MIB and Geosmin shall be taken immediately and analyzed upon SRWA's request. MIB and Geosmin concentrations shall be measured using Standard Methods 6040D. If the measured MIB or Geosmin concentration exceeds the required concentration, the Company may resample within 24 hours of receiving results of the first sample, and then average the two sample results before concluding whether a Finished Water quality violation has occurred. Repeat analyses shall be performed at the same laboratory.
- (g) Sample collection is to be evenly distributed throughout the entire Acceptance Test Period.
- (h) Measurements of Total Organic Carbon (TOC) at various locations during the Acceptance Test are necessary to prepare theoretical chemical usage rates for ozone and LOX.
- (i) Measurements shall be made for settled water (i.e., water leaving the sedimentation basins), and Finished Water. See Table 7-2 for TOC monitoring requirements for Raw Water.

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The Company shall demonstrate compliance with total log reduction requirements for *Cryptosporidium*, *Giardia*, and viruses. These results shall be included in the daily Acceptance Test Report, which summarizes for each day of the Acceptance Test, the average and the minimum removal credit for each hour and for the whole of that day—for each applicable unit process and for the plant as a whole. Demonstration of pathogen removals shall be calculated in a manner consistent with Applicable Law requirements.

The Acceptance Test Plan shall include the day and time of day when each water quality sample shall be collected during the Acceptance Test, and each sample shall be collected at the specified sample collection points and collection times identified in the Acceptance Test Plan—with no exceptions. The Acceptance Test Plan also shall have established acceptable deviation between on-line instrumentation and the verification grab samples.

The SRWA may collect and analyze its own samples during the Acceptance Test period to confirm the results of the Company’s analyses. the SRWA shall have the right to request sampling of additional parameters and/or increased monitoring frequency, once the Acceptance Test Plan is submitted to the SRWA for review, beyond the minimum requirements specified here; such additional sampling and/or monitoring shall be at the SRWA’s expense.

7.8.8 Conditions of Uncontrollable Circumstance Relief for Specified Raw Water Quality Parameters

As specified in the Contract and Appendix 6 (Performance Standards), the Company may be entitled to relief for certain Uncontrollable Circumstances related to adverse Raw Water quality. The Company shall be entitled to such relief only to the extent that the Company can demonstrate to the satisfaction of the SRWA that the specified Raw Water conditions existed, and that the Company was not able to comply with the Performance Standards. To demonstrate Raw Water quality for conditions of Uncontrollable Circumstance Relief, Raw Water samples shall be collected by the Company at frequencies greater than or equal to the minimum frequencies specified in Table 7-2.

Table 7-2. Minimum Raw Water Monitoring Requirements for Specified Raw Water Quality Parameters		
Parameter	Point of Performance Measurement	Raw Water Minimum Sampling Frequency
Turbidity	Raw Water Transmission Main ^(a)	3 samples per day, with at least 3 hours between samples
Total Organic Carbon (TOC)		1 sample per day
Bromide		3 samples per week, with at least 48 hours between samples
Manganese, dissolved		Every day
Iron, dissolved		Every 2 days
MIB, Geosmin		No more than twice during the Acceptance Test
(a) Raw water samples shall be collected from a location on the raw water pipeline as close to the Raw Water Pump Station as practical, but at least 100 pipe diameters upstream of the first point of chemical addition and/or point of recycle return flow.		

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7.8.9 Failure of the Acceptance Test

Failure to continuously demonstrate compliance with the Acceptance Test Standards during the Acceptance Test period shall constitute a failure of the Acceptance Test, except as noted in Section 7.8.9.1 (Failure to Comply with Noise Control and Outdoor Lighting Standards) of this Appendix. Any failure of the Acceptance Test shall require: (a) correction of those components or conditions that resulted in the failure; and (b) a restart of the Acceptance Test at time zero after proper notification is provided to the SRWA in accordance with Article 5.3 (Acceptance Testing) of the Contract. At the sole discretion of the SRWA, and upon request of the Company, the above requirements for restarting the Acceptance Test may be relaxed.

7.8.9.1 Failure to Comply with Noise Control and Outdoor Lighting Standards

If failure of the Acceptance Test is solely related to failure to achieve the Noise Control and Outdoor Lighting Standards that are not based on third party complaints, only retesting related to the specific aspect of the Noise Control and Outdoor Lighting Standards that failed Acceptance testing is required. Such testing shall be performed over three (3) 24-hour periods of Project operation at its design capacity.

Failure by the Company to achieve Noise Control and Outdoor Lighting Standards that are based on third-party complaints will not constitute a failure of the Acceptance Test. However, prior to Final Completion, the Company shall demonstrate to the SRWA's satisfaction that the Company has resolved the issue that caused the failure of the Noise Control and Outdoor Lighting Standards that is based on third-party complaints, including the implementation of modifications to the Project or the Company's recommended operating practices, as applicable.

7.8.9.2 Failure to Demonstrate Acceptable Chemical Use

Failure by the Company to demonstrate acceptable chemical use in accordance with Appendix 6 (Performance Standards) will not constitute a failure of the Acceptance Test. However, prior to Final Completion, the Company shall demonstrate to the SRWA's satisfaction that the Company has resolved the issue that caused the failure of the chemical usage, including the implementation of modifications to the Project or the Company's recommended operating practices, as applicable.

7.9 ACCEPTANCE TEST REPORT

Within thirty (30) calendar days following the last day of any Acceptance Test, the Company shall furnish the SRWA and the SRWA Engineer with five (5) hard copies and one (1) electronic copy of a written Acceptance Test Report. The Acceptance Test Report shall be prepared in accordance with the requirements specified in this Appendix, including the Acceptance Test Plan, and Section 5.3(D) (Test Report) of the Contract. The Acceptance Test Report shall be certified as true, complete, and correct by the Company and signed and stamped by its Engineer registered in the State of California. Additional, minimum requirements for the Acceptance Test Report are listed below:

- A detailed table of contents
- A certification that pre-Acceptance testing and the Acceptance Test was conducted in accordance with the approved Acceptance Test Plan.

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- A certification of the results of the testing with respect to each of the Acceptance Test Standards. Each Acceptance Test Standard shall be addressed separately and the basis for the determination presented. This certification of the results of the testing shall include:
 - A summary table and Excel[®] graph (or legible SCADA-generated graph with clearly labeled axes designating units of measurement) comparing the actual values to the minimum performance Acceptance Test Standards, and explanations for any failures to achieve such minimum Acceptance Test Standards. The level of detail of such information shall be sufficient so that all performance metrics cited in the Acceptance Test Report can be independently calculated and verified.
 - A determination of the extent to which the Project complies with the applicable Performance Standards.
- All data measured and recorded during the tests, including: laboratory analyses; instrument calibrations and measurements; chemical consumption; and noise and light measurements. Chemical consumption data shall be accompanied by the Company's theoretical usage calculations as required under Section 6.2 of Appendix 6 (Performance Standards).
- Pre-Acceptance testing results, including the following (the Company may incorporate the Pre-Acceptance Test Report by attachment to the Acceptance Test Report):
 - Pressure and leakage test results
 - Mechanical systems test results
 - Electrical and instrumentation systems test results
 - Hydraulic test results
 - Process and performance testing results, including:
 - Tracer test results (if performed – see Section 7.5.5.1 [Tracer Testing]), signed and sealed by a registered Professional Engineer in the State of California
 - Process performance design criteria test results related to primary disinfection, filtration, and Finished Water quality
 - Ozone system challenge test results, signed and sealed by a registered Professional Engineer in the State of California
 - Loss-of-PLC control challenge test results
- All data deemed to be outliers along with an explanation of why such data were judged to be outliers.
- All water quality laboratory reports prepared by or for the Company.
- An organized comparison of all SCADA data, laboratory analytical data, local instrumentation readings, and field measurements that is sufficiently detailed to show how the data were verified for accuracy and precision.
- All instrument and control settings (including proportional–integral–derivative (PID) loop control parameters) and any measurements, checks, and settings that may be required by operating and maintenance personnel.

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- Record of equipment outages, failures, repairs, and preventative maintenance.
- Report of all spare parts used and replaced during pre-Acceptance testing and Acceptance testing.
- Summary of test results and conclusive evidence of compliance with all test requirements.
- All calculations used in determining test results, including sufficient documentation to allow independent verification.
- Summary of whether or not, and how often, the Acceptance Test was aborted. If the Acceptance Test was aborted at any time, include a summary of causes and resolutions.
- Summary of whether or not any portion of the Project was shut down during Acceptance testing. If any shutdowns occurred, include a summary of causes and resolutions.
- All other data reasonably requested by the SRWA to be included in such reports.
- All certifications shall be signed and sealed by an Engineer licensed in California, employed by the Company, and responsible for the design of the Project.