Request for Proposal
RFP-5166-23-SDH

WASTEWATER TREATMENT PLANT SCADA UPGRADE DESIGN

RESPONSES DUE:
February 23, 2023 prior to 2:30 P.M.

Accepting Electronic Responses Only Submitted Through the Rocky Mountain E-Purchasing System (RMEPS)
www.bidnetdirect.com/colorado

(Purchasing Representative does not have access or control of the vendor side of RMEPS. If website or other problems arise during response submission, vendor MUST contact RMEPS to resolve issue prior to the response deadline. 800-835-4603)

PURCHASING REPRESENTATIVE:
Scott Hockins, IT Supervisor

Preproposal Meeting January 12, 2:00 Mountain Time
Join on your computer, mobile app or room device
Click here to join the meeting
Meeting ID: 219 402 986 09
Passcode: xtrRbZ
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This solicitation has been developed specifically for a Request for Proposal intended to solicit competitive responses for this solicitation and may not be the same as previous City of Grand Junction solicitations. All offerors are urged to thoroughly review this solicitation prior to submitting. Submittal by **FAX, EMAIL or HARD COPY IS NOT ACCEPTABLE** for this solicitation.

REQUEST FOR PROPOSAL

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REQUEST FOR PROPOSAL

SECTION 1.0: ADMINISTRATIVE INFORMATION & CONDITIONS FOR SUBMITTAL

NOTE: It is the Firm's responsibility to read and review all solicitation documentation in its entirety, and to ensure that they have a clear and complete understanding of not only the scope, specifications, project requirements, etc., but also all other requirements, instructions, rules, regulations, laws, conditions, statements, procurement policies, etc. that are associated with the solicitation process and project/services being solicited.

1.1 Issuing Office: This Request for Proposal (RFP) is issued by the City of Grand Junction. All contact regarding this RFP is directed to:

RFP QUESTIONS:
Scott Hockins, IT Supervisor
scotth@gjcity.org

1.2 Purpose: The purpose of this RFP is to obtain proposals from qualified professional consultant firms or individuals for a Wastewater Treatment Plant SCADA Upgrade Design.

1.3 The Owner: The Owner is the City of Grand Junction, Colorado and is referred to throughout this Solicitation. The term Owner means the Owner or his authorized representative.

1.4 Compliance: All participating Offerors, by their signature hereunder, shall agree to comply with all conditions, requirements, and instructions of this RFP as stated or implied herein. Should the Owner omit anything from this packet which is necessary to the clear understanding of the requirements, or should it appear that various instructions are in conflict, the Offeror(s) shall secure instructions from the Purchasing Division prior to the date and time of the submittal deadline shown in this RFP.

1.5 Procurement Process: Procurement processes shall be governed by the most current version of the City of Grand Junction Purchasing Policy and Procedure Manual.

1.6 Submission: Each proposal shall be submitted in electronic format only, and only through the Rocky Mountain E-Purchasing (BidNet Colorado) website, www.bidnetdirect.com/colorado**.** *This site offers both "free" and "paying" registration options that allow for full access of the Owner's documents and for electronic submission of proposals. (Note: "free" registration may take up to 24 hours to process. Please Plan accordingly.)* Please view our "**Electronic Vendor Registration Guide"** at http://www.gjcity.org/501/Purchasing-Bids for details. (Purchasing Representative does not have access or control of the vendor side of RMEPS. If website or other problems arise during response submission, vendor **MUST** contact RMEPS to resolve issue prior to the response deadline. **800-835-4603**).

1.7 Altering Proposals: Any alterations made prior to opening date and time must be initialed by the signer of the proposal, guaranteeing authenticity. Proposals cannot be altered or amended after submission deadline.

1.8 Withdrawal of Proposal: A proposal must be firm and valid for award and may not be withdrawn or canceled by the Offeror for sixty (60) days following the submittal deadline date, and only prior to award. The Offeror so agrees upon submittal of their proposal. After awarding this statement is not applicable.

1.9 Acceptance of Proposal Content: The contents of the proposal of the successful Offeror shall become contractual obligations if acquisition action ensues. Failure of the successful Offeror to accept these obligations in a contract shall result in cancellation of the award and such vendor shall be removed from future solicitations.

1.10 Addenda: All questions shall be submitted in writing to the appropriate person as shown in Section 1.1. Any interpretations, corrections and changes to this RFP or extensions to the opening/receipt date shall be made by a written Addendum to the RFP by the City. Sole authority to authorize addenda shall be vested in the City of Grand Junction Purchasing Representative. Addenda will be issued electronically through the Rocky Mountain E-Purchasing website at www.bidnetdirect.com/colorado and on the City's website at www.gjcity.org/501/Purchasing/Bids . Offerors shall acknowledge receipt of all addenda in their proposal.

1.11 Exceptions and Substitutions: All proposals meeting the intent of this RFP shall be considered for award. Offerors taking exception to the specifications shall do so at their own risk. The Owner reserves the right to accept or reject any or all substitutions or alternatives. When offering substitutions and/or alternatives, Offeror must state these exceptions in the section pertaining to that area. Exception/substitution, if accepted, must meet, or exceed the stated intent and/or specifications. The absence of such a list shall indicate that the Offeror has not taken exceptions, and if awarded a contract, shall hold the Offeror responsible to perform in strict accordance with the specifications or scope of services contained herein.

1.12 Confidential Material: All materials submitted in response to this RFP shall ultimately become public record and shall be subject to inspection after contract award. "**Proprietary or Confidential Information"** is defined as any information that is not generally known to competitors and which provides a competitive advantage. Unrestricted disclosure of proprietary information places it in the public domain. Only submittal information clearly identified with the words "***Confidential Disclosure***" and uploaded as a separate document shall establish a confidential, proprietary relationship. Any material to be treated as confidential or proprietary in nature must include a justification for the request. The request shall be reviewed and either approved or denied by the Owner. If denied, the proposer shall have the opportunity to withdraw its entire proposal, or to remove the confidential or proprietary restrictions. Neither cost nor pricing information nor the total proposal shall be considered confidential or proprietary.

1.13 Response Material Ownership: All proposals become the property of the Owner upon receipt and shall only be returned to the proposer at the Owner's option. Selection or rejection of the proposal shall not affect this right. The Owner shall have the right to use all ideas or adaptations of the ideas contained in any proposal received in response to this RFP, subject to limitations outlined in the entitled "Confidential Material". Disqualification of a proposal does not eliminate this right.

1.14 Minimal Standards for Responsible Prospective Offerors: A prospective Offeror must affirmably demonstrate their responsibility. A prospective Offeror must meet the following requirements.

- Have adequate financial resources, or the ability to obtain such resources as required.
- Be able to comply with the required or proposed completion schedule.
- Have a satisfactory record of performance.
- Have a satisfactory record of integrity and ethics.
- Be otherwise qualified and eligible to receive an award and enter into a contract with the Owner.

1.15 Open Records: Proposals shall be received and publicly acknowledged at the location, date, and time stated herein. Offerors, their representatives and interested persons may be present. Proposals shall be received and acknowledged only so as to avoid disclosure of process. However, all proposals shall be open for public inspection after the contract is awarded. Trade secrets and confidential information contained in the proposal so identified by offer as such shall be treated as confidential by the Owner to the extent allowable in the Open Records Act.

1.16 Sales Tax: The Owner is, by statute, exempt from the State Sales Tax and Federal Excise Tax; therefore, all fees shall not include taxes.

1.17 Public Opening: Proposals shall be opened virtually immediately following the proposal deadline. Offerors, their representatives and interested persons may attend virtually. See Section 1.6 for details. Only the names and locations on the proposing firms will be disclosed.

SECTION 2.0: GENERAL CONTRACT TERMS AND CONDITIONS

2.1. Acceptance of RFP Terms: A proposal submitted in response to this RFP shall constitute a binding offer. Acknowledgment of this condition shall be indicated on the Letter of Interest or Cover Letter by the autographic signature of the Offeror or an officer of the Offeror legally authorized to execute contractual obligations. A submission in response to the RFP acknowledges acceptance by the Offeror of all terms and conditions including compensation, as set forth herein. An Offeror shall identify clearly and thoroughly any variations between its proposal and the Owner's RFP requirements. Failure to do so shall be deemed a waiver of any rights to subsequently modify the terms of performance, except as outlined or specified in the RFP.

2.2. Execution, Correlation, Intent, and Interpretations: The Contract Documents shall be signed by the Owner and Firm. By executing the contract, the Firm represents that they have familiarized themselves with the local conditions under which the Services is to be performed and correlated their observations with the requirements of the Contract Documents. The Contract Documents are complementary, and what is required by anyone, shall be as binding as if required by all. The intention of the documents is to include all labor, materials, equipment, services, and other items necessary for the proper execution and completion of the scope of services as defined in the technical specifications and drawings contained herein. All drawings, specifications and copies furnished by the Owner are, and shall remain, Owner property. They are not to be used on any other project.

2.3. Permits, Fees, & Notices: The Firm shall secure and pay for all permits, governmental fees and licenses necessary for the proper execution and completion of the services. The Firm shall give all notices and comply with all laws, ordinances, rules, regulations and orders of any public authority bearing on the performance of the services. If the Firm observes that any of the Contract Documents are at variance in any respect, he shall promptly notify the Owner in writing, and any necessary changes shall be adjusted by approximate modification. If the Firm performs any services knowing it to be contrary to such laws, ordinances, rules and regulations, and without such notice to the Owner, he shall assume full responsibility and shall bear all costs attributable.

2.4. Responsibility for those Performing the Services: The Firm shall be responsible to the Owner for the acts and omissions of all his employees and all other persons performing any of the services under a contract with the Firm.

2.5. Payment & Completion: The Contract Sum is stated in the Contract and is the total amount payable by the Owner to the Firm for the performance of the services under the Contract Documents. Upon receipt of written notice that the services is ready for final inspection and acceptance and upon receipt of application for payment, the Owner's Project Manager will promptly make such inspection and, when they find the services acceptable under the Contract Documents and the Contract fully performed, the Owner shall make payment in the manner provided in the Contract Documents. Partial payments will be based upon estimates, prepared by the Firm, of the value of services performed and materials placed in accordance with the Contract Documents. The services performed by Firm shall be in accordance with generally accepted professional practices and the level of competency presently maintained by other practicing professional firms in the same or similar type of services in the applicable community. The services and services to be performed by Firm hereunder shall be done in compliance with applicable laws, ordinances, rules and regulations.

2.6. Protection of Persons & Property: The Firm shall comply with all applicable laws, ordinances, rules, regulations, and orders of any public authority having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss. Firm shall erect and maintain, as required by existing safeguards for safety and protection, and all reasonable precautions, including posting danger signs or other warnings against hazards promulgating safety regulations and notifying owners and users of adjacent utilities. When or where any direct or indirect damage or injury is done to public or private property by or on account of any act, omission, neglect, or misconduct by the Firm in the execution of the services, or in consequence of the non-execution thereof by the Firm, they shall restore, at their own expense, such property to a condition similar or equal to that existing before such damage or injury was done, by repairing, rebuilding, or otherwise restoring as may be directed, or it shall make good such damage or injury in an acceptable manner.

2.7. Changes in the Services: The Owner, without invalidating the contract, may order changes in the services within the general scope of the contract consisting of additions, deletions, or other revisions. All such changes in the services shall be authorized by Change Order/Amendment and shall be executed under the applicable conditions of the contract documents. A Change Order/Amendment is a written order to the Firm signed by the Owner issued after the execution of the contract, authorizing a change in the services or an adjustment in the contract sum or the contract time.

2.8. Minor Changes in the Services: The Owner shall have authority to order minor changes in the services not involving an adjustment in the contract sum or an extension of the contract time and not inconsistent with the intent of the contract documents.

2.9. Uncovering & Correction of Services: The Firm shall promptly correct all services found by the Owner as defective or as failing to conform to the contract documents. The Firm shall bear all costs of correcting such rejected services, including the cost of the Owner's additional services thereby made necessary. The Owner shall give such notice promptly after discovering of condition. All such defective or non-conforming services under the above paragraphs shall be removed from the site where necessary and the services shall be corrected to comply with the contract documents without cost to the Owner.

2.10. Acceptance Not Waiver: The Owner's acceptance or approval of any services furnished hereunder shall not in any way relieve the proposer of their present responsibility to maintain the high quality, integrity and timeliness of his services. The Owner's approval or acceptance of, or payment for, any services shall not be construed as a future waiver of any rights under this Contract, or of any cause of action arising out of performance under this Contract.

2.11. Change Order/Amendment: No oral statement of any person shall modify or otherwise change, or affect the terms, conditions or specifications stated in the resulting contract. All amendments to the contract shall be made in writing by the Owner.

2.12. Assignment: The Offeror shall not sell, assign, transfer or convey any contract resulting from this RFP, in whole or in part, without the prior written approval from the Owner.

2.13. Compliance with Laws: Proposals must comply with all Federal, State, County and local laws governing or covering this type of service and the fulfillment of all ADA (Americans with Disabilities Act) requirements. Firm hereby warrants that it is qualified to assume the responsibilities and render the services described herein and has all requisite corporate authority and professional licenses in good standing, required by law.

2.14. Debarment/Suspension: The Firm herby certifies that the Firm is not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Governmental department or agency.

2.15. Confidentiality: All information disclosed by the Owner to the Offeror for the purpose of the services to be done or information that comes to the attention of the Offeror during the course of performing such services is to be kept strictly confidential.

2.16. Conflict of Interest: No public official and/or Owner employee shall have interest in any contract resulting from this RFP.

2.17. Contract: This Request for Proposal, submitted documents, and any negotiations, when properly accepted by the Owner, shall constitute a contract equally binding between the Owner and Offeror. The contract represents the entire and integrated agreement between the parties hereto and supersedes all prior negotiations, representations, or agreements, either written or oral, including the Proposal documents. The contract may be amended or modified with Change Orders, Field Orders, or Amendment.

2.18. Project Manager/Administrator: The Project Manager, on behalf of the Owner, shall render decisions in a timely manner pertaining to the services proposed or performed by the Offeror. The Project Manager shall be responsible for approval and/or acceptance of any related performance of the Scope of Services.

2.19. Contract Termination: This contract shall remain in effect until any of the following occurs: (1) contract expires; (2) completion of services; (3) acceptance of services or, (4) for convenience terminated by either party with a written *Notice of Cancellation* stating therein the reasons for such cancellation and the effective date of cancellation at least thirty days past notification.

2.20. Employment Discrimination: During the performance of any services per agreement with the Owner, the Offeror, by submitting a Proposal, agrees to the following conditions:

2.20.1. The Offeror shall not discriminate against any employee or applicant for employment because of race, religion, color, sex, age, disability, citizenship status, marital status, veteran status, sexual orientation, national origin, or any legally protected status except when such condition is a legitimate occupational qualification reasonably necessary for the normal operations of the Offeror. The Offeror agrees to post in conspicuous places, visible to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.

2.20.2. The Offeror, in all solicitations or advertisements for employees placed by or on behalf of the Offeror, shall state that such Offeror is an Equal Opportunity Employer.

2.20.3. Notices, advertisements, and solicitations placed in accordance with federal law, rule, or regulation shall be deemed sufficient for the purpose of meeting the requirements of this section.

2.21. Immigration Reform and Control Act of 1986 and Immigration Compliance: The Offeror certifies that it does not and will not during the performance of the contract employ illegal alien services or otherwise violate the provisions of the Federal Immigration Reform and Control Act of 1986 and/or the immigration compliance requirements of State of Colorado C.R.S. § 8-17.5-101, (House Bill 06-1343).

2.22. Ethics: The Offeror shall not accept or offer gifts or anything of value nor enter into any business arrangement with any employee, official, or agent of the Owner.

2.23. Failure to Deliver: In the event of failure of the Offeror to deliver services in accordance with the contract terms and conditions, the Owner, after due oral or written notice, may procure the services from other sources and hold the Offeror responsible for any costs resulting in additional purchase and administrative services. This remedy shall be in addition to any other remedies that the Owner may have.

2.24. Failure to Enforce: Failure by the Owner at any time to enforce the provisions of the contract shall not be construed as a waiver of any such provisions. Such failure to enforce shall not affect the validity of the contract or any part thereof or the right of the Owner to enforce any provision at any time in accordance with its terms.

2.25. Force Majeure: The Offeror shall not be held responsible for failure to perform the duties and responsibilities imposed by the contract due to legal strikes, fires, riots, rebellions, and acts of God beyond the control of the Offeror, unless otherwise specified in the contract.

2.26. Indemnification: Offeror shall defend, indemnify and save harmless the Owner and all its officers, employees, insurers, and self-insurance pool, from and against all liability, suits, actions, or other claims of any character, name and description brought for or on account of any injuries or damages received or sustained by any person, persons, or property on account of any negligent act or fault of the Offeror, or of any Offeror's agent, employee, sub-Firm or supplier in the execution of, or performance under, any contract which may result from proposal award. Offeror shall pay any judgment with cost which may be obtained against the Owner growing out of such injury or damages.

2.27. Independent Firm: The Offeror shall be legally considered an Independent Firm and neither the Firm nor its employees shall, under any circumstances, be considered servants or agents of the Owner. The Owner shall be at no time legally responsible for any negligence or other wrongdoing by the Firm, its servants, or agents. The Owner shall not withhold from the contract payments to the Firm any federal or state unemployment taxes, federal or state income taxes, Social Security Tax or any other amounts for benefits to the Firm. Further, the Owner shall not provide to the Firm any insurance coverage or other benefits, including Workers' Compensation, normally provided by the Owner for its employees.

2.28. Nonconforming Terms and Conditions: A proposal that includes terms and conditions that do not conform to the terms and conditions of this Request for Proposal is subject to rejection as non-responsive. The Owner reserves the right to permit the Offeror to withdraw nonconforming terms and conditions from its proposal prior to a determination by the Owner of non-responsiveness based on the submission of nonconforming terms and conditions.

2.29. Ownership: All plans, prints, designs, concepts, etc., shall become the property of the Owner.

2.30. Oral Statements: No oral statement of any person shall modify or otherwise affect the terms, conditions, or specifications stated in this document and/or resulting agreement. All modifications to this request and any agreement must be made in writing by the Owner.

2.31. Patents/Copyrights: The Offeror agrees to protect the Owner from any claims involving infringements of patents and/or copyrights. In no event shall the Owner be liable to the Offeror for any/all suits arising on the grounds of patent(s)/copyright(s) infringement. Patent/copyright infringement shall null and void any agreement resulting from response to this RFP.

2.32. Venue: Any agreement because of responding to this RFP shall be deemed to have been made in, and shall be construed and interpreted in accordance with, the laws of the City of Grand Junction, Mesa County, Colorado.

2.33. Expenses: Expenses incurred in preparation, submission and presentation of this RFP are the responsibility of the company and cannot be charged to the Owner.

2.34. Sovereign Immunity: The Owner specifically reserves its right to sovereign immunity pursuant to Colorado State Law as a defense to any action arising in conjunction to this agreement.

2.35. Public Funds/Non-Appropriation of Funds: Funds for payment have been provided through the Owner's budget approved by the City Council/Board of County Commissioners for the stated fiscal year only. State of Colorado statutes prohibit the obligation and expenditure of public funds beyond the fiscal year for which a budget has been approved. Therefore, anticipated orders or other obligations that may arise past the end of the stated Owner's fiscal year shall be subject to budget approval. Any contract will be subject to and must contain a governmental non-appropriation of funds clause.

2.36. Collusion Clause: Each Offeror by submitting a proposal certifies that it is not party to any collusive action or any action that may be in violation of the Sherman Antitrust Act. All proposals shall be rejected if there is evidence or reason for believing that collusion exists among the proposers. The Owner may or may not, at the discretion of the Owner Purchasing Representative, accept future proposals for the same service or commodities for participants in such collusion.

2.37. Gratuities: The Firm certifies and agrees that no gratuities or kickbacks were paid in connection with this contract, nor were any fees, commissions, gifts or other considerations made contingent upon the award of this contract. If the Firm breaches or violates this warranty, the Owner may, at their discretion, terminate this contract without liability to the Owner.

2.38. Performance of the Contract: The Owner reserves the right to enforce the performance of the contract in any manner prescribed by law or deemed to be in the best interest of the Owner in the event of breach or default of resulting contract award.

2.39. Benefit Claims: The Owner shall not provide to the Offeror any insurance coverage or other benefits, including Worker's Compensation, normally provided by the Owner for its employees.

2.40. Default: The Owner reserves the right to terminate the contract in the event the Firm fails to meet delivery or completion schedules, or otherwise perform in accordance with the accepted proposal. Breach of contract or default authorizes the Owner to purchase like services elsewhere and charge the full increase in cost to the defaulting Offeror.

2.41. Multiple Offers: If said proposer chooses to submit more than one offer, THE ALTERNATE OFFER must be clearly marked "Alternate Proposal". The Owner reserves the right to make award in the best interest of the Owner.

2.42. Cooperative Purchasing: Purchases as a result of this solicitation are primarily for the Owner. Other governmental entities may be extended the opportunity to utilize the resultant contract award with the agreement of the successful provider and the participating agencies. All participating entities will be required to abide by the specifications, terms, conditions and pricings established in this Proposal. The quantities furnished in this proposal document are for only the Owner. It does not include quantities for any other jurisdiction. The Owner will be responsible only for the award for our jurisdiction. Other participating entities will place their own awards on their respective Purchase Orders through their purchasing office or use their purchasing card for purchase/payment as

authorized or agreed upon between the provider and the individual entity. The Owner accepts no liability for payment of orders placed by other participating jurisdictions that choose to piggy-back on our solicitation. Orders placed by participating jurisdictions under the terms of this solicitation will indicate their specific delivery and invoicing instructions.

2.43. Definitions:

2.43.1. "Offeror" and/or "Proposer" refers to the person or persons legally authorized by the Consultant to make an offer and/or submit a response (fee) proposal in response to the Owner's RFP.

2.43.2. The term "Services" includes all labor, materials, equipment, and/or services necessary to produce the requirements of the Contract Documents.

2.43.3. "Firm" is the person, organization, firm or consultant identified as such in the Agreement and is referred to throughout the Contract Documents. The term Firm means the Firm or his authorized representative. The Firm shall carefully study and compare the Scope of Services, Addenda and Modifications and shall at once report to the Owner any error, inconsistency, or omission he may discover. Firm shall not be liable to the Owner for any damage resulting from such errors, inconsistencies, or omissions. The Firm shall not commence services without clarifying Drawings, Specifications, or Interpretations.

2.43.4. "Sub-Contractor is a person or organization who has a direct contract with the Firm to perform any of the services at the site. The term Sub-Firm is referred to throughout the contract documents and means a Sub-Contractor or his authorized representative.

2.44. Public Disclosure Record: If the Proposer has knowledge of their employee(s) or sub-proposers having an immediate family relationship with an Owner employee or elected official, the proposer must provide the Purchasing Representative with the name(s) of these individuals. These individuals are required to file an acceptable "Public Disclosure Record", a statement of financial interest, before conducting business with the Owner.

SECTION 3.0: INSURANCE REQUIREMENTS

3.1 Insurance Requirements: The selected Firm agrees to procure and maintain, at its own cost, policy(s) of insurance sufficient to insure against all liability, claims, demands, and other obligations assumed by the Firm pursuant to this Section. Such insurance shall be in addition to any other insurance requirements imposed by this Contract or by law. The Firm shall not be relieved of any liability, claims, demands, or other obligations assumed pursuant to this Section by reason of its failure to procure or maintain insurance in sufficient amounts, durations, or types.

Firm shall procure and maintain and, if applicable, shall cause any Sub-Firm of the Firm to procure and maintain insurance coverage listed below. Such coverage shall be procured and maintained with forms and insurers acceptable to The Owner. All coverage shall be continuously maintained to cover all liability, claims, demands, and other obligations assumed by the Firm pursuant to this Section. In the case of any claims-made policy, the necessary retroactive dates and extended reporting periods shall be procured to maintain such continuous coverage. Minimum coverage limits shall be as indicated below unless specified otherwise in the Special Conditions:

(a) Worker Compensation: Firm shall comply with all State of Colorado Regulations concerning Workers' Compensation insurance coverage.

(b) General Liability insurance with minimum combined single limits of:

ONE MILLION DOLLARS ($1,000,000) each occurrence and
ONE MILLION DOLLARS ($1,000,000) per job aggregate.

The policy shall be applicable to all premises, products and completed operations. The policy shall include coverage for bodily injury, broad form property damage (including completed operations), personal injury (including coverage for contractual and employee acts), blanket contractual, products, and completed operations. The policy shall include coverage for explosion, collapse, and underground (XCU) hazards. The policy shall contain a severability of interests provision.

(c) Comprehensive Automobile Liability insurance with minimum combined single limits for bodily injury and property damage of not less than:

ONE MILLION DOLLARS ($1,000,000) each occurrence and
ONE MILLION DOLLARS ($1,000,000) aggregate

(d) Professional Liability & Errors and Omissions Insurance policy with a minimum of:

ONE MILLION DOLLARS ($1,000,000) per claim

This policy shall provide coverage to protect the Firm against liability incurred as a result of the professional services performed as a result of responding to this Solicitation.

With respect to each of Consultant's owned, hired, or non-owned vehicles assigned to be used in performance of the Services. The policy shall contain a severability of interests provision.

3.2 Additional Insured Endorsement: The policies required by paragraphs (b), and (c) above shall be endorsed to include the Owner and the Owner's officers and employees as additional insureds. Every policy required above shall be primary insurance, and any insurance carried by the Owner, its officers, or its employees, or carried by or provided through any insurance pool of the Owner, shall be excess and not contributory insurance to that provided by Firm. The Firm shall be solely responsible for any deductible losses under any policy required above.

SECTION 4.0: SPECIFICATIONS/SCOPE OF SERVICES

Scope of Work: The City of Grand Junction is seeking proposals from qualified vendors to perform a Persigo Wastewater Treatment Plant (WWTP) SCADA Upgrade Design. This Design will document Persigo WWTP SCADA system current state, desired future state and recommended steps to achieve the desired future state. The service area that the Persigo WWTP serves is continuing to experience growth and as a result the Persigo WWTP SCADA system needs to be updated to account for this growth and for upgrading cyber and physical security.

Currently, the Persigo WWTP does not have fiber optics at the plant and Persigo relies on radio based telemetry for access to the City network. By the end of year 2023, the Persigo WWTP plans to have fiber installed to the plant. Getting fiber to Persigo in 2023 is a top priority and will allow Persigo and the City's IT Department to start implementing the results of the SCADA Upgrade Design.

The Persigo WWTP currently utilizes Siemens SCADA systems. The Persigo WWTP has two full-time SCADA Technicians/Programmers. The consultant selected as part of this RFP process shall meet with Persigo's SCADA Technicians to document the current SCADA system and our SCADA Tech's recommendations for improvements.

In 2020/2021 the Persigo WWTP worked with Carollo Engineering on developing the 2020 Wastewater Treatment Facilities Master Plan Study. The City initiated the 2020 Master Plan Study to address service area growth, aging infrastructure, and operational efficiencies at the WWTP and in the collection system. Chapter 7 within the Master Plan Study addresses infrastructure and personnel facilities at the WWTP including electrical distribution, SCADA, Instrumentation and Controls, Site Security, etc. The Master Plan Study will be made available.

The scope of services set forth in this Request for Proposals (RFP) represents an outline of the services which the City of Grand Junction anticipates the successful proposer to perform and is presented for the primary purpose of allowing the City of Grand Junction to compare proposals.

The City of Grand Junction's IT Department will be reviewing SCADA cybersecurity requirements, and the security recommendations presented in this Design should be modeled after industry standards such as America's Water Infrastructure Act (AIWA) or the American Water Works Association (AWWA) cyber security standards.

The Persigo WWTP SCADA Upgrade Design shall include:

1. Identification of the technology, manufacturer, and additional functionality needed from the SCADA system. This shall include recommendations for a new WWTP SCADA system control room and recommendations for the number of workstations needed to meet security and staffing needs and identify the requirements and types of audio-visual equipment needed in the new control room.
2. Determine the effectiveness and reliability of the overall network infrastructure, identify areas that need improvement and documented design for future state SCADA network.
3. Develop a site plan and construction plans of the proposed routing for implementing a facility-wide (loop) upgrade to medium-voltage and installation of an industrial fiber network. An example of the proposed routing for new electrical and fiber is shown in the Master Plan Study in Figure 7.2. The Persigo WWTP intends to use the construction plans developed as part of this Design for future construction.
4. Recommendations and design for replacing control panels and PLCs at the Persigo WWTP and connecting PLCs to the Ethernet network. Provide a recommended PLC replacement program with estimated annual costs per year.
5. Conduct a facility-wide cyber security audit and provide recommendations and design for physical security improvements including access control and video surveillance at the Persigo WWTP.

6. Recommendations and designs for cyber-security improvements that include network segmentation and isolation between Operations Technology (OT) and Information Technology (IT) networks. Secure remote access to OT network for monitoring and controls, proper network address to match City's networking scheme, plans for device and software patching, and integration with City's security monitoring services.
7. Asset inventory into City's asset management system. Including life-cycle management and expected replacement dates of equipment and projected budgetary considerations. The City uses Lucity for asset management.
8. Recommendations for maintenance contracts for software and hardware.
9. Evaluate and document Persigo's current non-standard 3rd party supported equipment in the WWTP process buildings and provide recommendations for 3rd party service level agreements for maintenance.
10. Sufficient SCADA design detail to support the secure implementation of SCADA upgrades.

Attached Documents: 2020 Wastewater Treatment Facilities Master Plan – Chapter 7

- Pre-Proposal Meeting: January 12, 2023
- Inquiry deadline, no questions after this date: February 10, 2023
- Addendum Posted: February 16, 2023
- Submittal deadline for proposals: February 23, 2023

Questions Regarding Scope of Services:
scotth@gjcity.org

SECTION 5.0: PREPARATION AND SUBMITTAL OF PROPOSALS

Submission: **Each proposal shall be submitted in electronic format only through the BidNet website, www.bidnetdirect.com/colorado.** This site offers both "free" and "paying" registration options that allow for full access of the City's documents and for electronic submission of proposals. (Note: "free" registration may take up to 24 hours to process. Please Plan accordingly.) (Purchasing Representative does not have access or control of the vendor side of RMEPS. If website or other problems arise during response submission, vendor **MUST** contact RMEPS to resolve issue prior to the response deadline; **800-835-4603**). For proper comparison and evaluation, the City requests that proposals be formatted as directed. Offerors are required to indicate their interest in this Project, show their specific experience and address their capability to perform the Scope of Services in the Time Schedule as set forth herein. For proper comparison and evaluation, the City requires that proposals be formatted **A** to **F**.

A. **Cover Letter:** Cover letter shall be provided which explains the Firm's interest in the project. The letter shall contain the name/address/phone number/email of the person who will serve as the firm's principal contact person with Owner's Contract Administrator and shall identify individual(s) who will be authorized to make presentations on behalf of the firm. The statement shall bear the signature of the person having proper authority to make formal commitments on behalf of the firm. By submitting a response to this solicitation, the Firm agrees to all requirements herein.

B. **Qualifications/Experience/Credentials:** Provide qualifications for consideration as a professional consultant with experience wastewater treatment plant SCADA system designs. Include prior experience with similar projects.

C. **Strategy and Implementation:** Describe your (the firm's) interpretation of the Owner's objectives regarding this RFP. Describe the proposed strategy and/or plan for achieving the objectives of this RFP. The Firm may utilize a written narrative or any other printed technique to demonstrate their ability to satisfy the Scope of Services. The narrative should describe a logical progression of tasks and efforts starting with the initial steps or tasks to be accomplished and continuing until all proposed tasks are fully described and the RFP objectives are accomplished. Include a **time schedule** for completion of your firm's implementation plan, deliverables, and an estimate of time commitments.

D. **References:** A minimum of three (3) **references** that can attest to your experience in projects of similar scope and size. **Please also summarize the projects completed with these references including** Client Name, Address, Contact Person, Telephone, Email Address, Project Dates, Project Description, Budget, etc.

E. **Design Budget:** The Owner has $200,000 budgeted for the completion of this design.

F. **Additional Data (optional):** Provide any additional information that will aid in evaluation of your qualifications with respect to this project.

SECTION 6.0: EVALUATION CRITERIA AND FACTORS

6.1 **Evaluation:** An evaluation team shall review all responses and select the proposal or proposals that best demonstrate the capability in all aspects to perform the scope of services and possess the integrity and reliability that will ensure good faith performance.

6.2 **Intent:** Only respondents who meet the qualification criteria will be considered. Therefore, it is imperative that the submitted proposal clearly indicate the firm's ability to provide the services described. Submittal evaluations will be done in accordance with the criteria and procedure defined. The Owner reserves the right to reject all portions of proposals and take into consideration past performance.

References of the short-listed firms will be assessed during the final phase of the evaluation process. The Owner will undertake negotiations with the top-rated firm and may choose not to negotiate with lower rated firms unless negotiations with higher rated firms have been unsuccessful and terminated.

6.3 **Oral Interviews:** **T**he Owner reserves the right to invite the most qualified rated proposer(s) to participate in oral interviews, if needed.

6.4 **Award:** The Owner reserves the right to consider all the information submitted and/or oral presentations, if required, in selecting the project Firm.

Chapter 7

SUPPORTING INFRASTRUCTURE AND PERSONNEL FACILITIES

For safe and reliable facility operation, it is critical to maintain the condition of the support utilities, such as electrical systems, control systems, natural gas supply, and potable water systems. Doing so promotes staff health and safety and provides the ability to reliably meet effluent goals and regulatory requirements.

This chapter provides information and recommendations for the support systems, developed from site investigations and discussions with Grand Junction staff.

7.1 Electrical Systems

7.1.1 Main Utility Feeds and Primary Switchgear

The Persigo WWTP has two primary electric utility feeds to a pad mount medium voltage switch maintained by Xcel Energy (Xcel). The pad mount equipment can automatically transfer between sources during power interruptions to either source. From the Xcel-owned pad mount equipment, a single medium voltage feed continues to the City-owned outdoor primary switchgear, which utilize fused switches to power a medium voltage loop.

The medium voltage loop continues through the site duct bank system to distribute power to step down transformers for various facilities. A diagram of the electrical connections and basic routing of the loop is shown in Figure 7.1.

7.1.1.1 Outdoor Primary Switchgear

The outdoor primary switchgear consists of fused switches to provide loop power for the facility. The outdoor gear was replaced in the last 5 years and appears to be in good condition. Because the equipment is new, it is not recommended for replacement. The gear is vulnerable to weather and wildlife and because of the fuses, there is limited coordination with downstream overcurrent devices. In the future, when the gear is considered for replacement, Carollo recommends evaluating an electrical room and switchgear that uses a circuit breaker and relays for overcurrent protection, a remote-control panel so facility staff does not have to be near electrical hazards, remote racking mechanism, and arc flash detection relays.

Primary switchgear.

During the site investigation, it was noted that the electrical staff does not have current training or capabilities to work on the medium voltage equipment. To handle emergencies and general maintenance of the medium voltage electrical system, it is recommended to either:

1. Invest in the training and equipment needed to safely work on the medium voltage system.
2. Develop an on-call contract with a third-party company to maintain and respond to emergencies in the medium voltage system.

Additionally, it is not known what the current fuse sizes are withing the gear. This should be I investigated, and spare fuses of each size be kept and stored for future use.

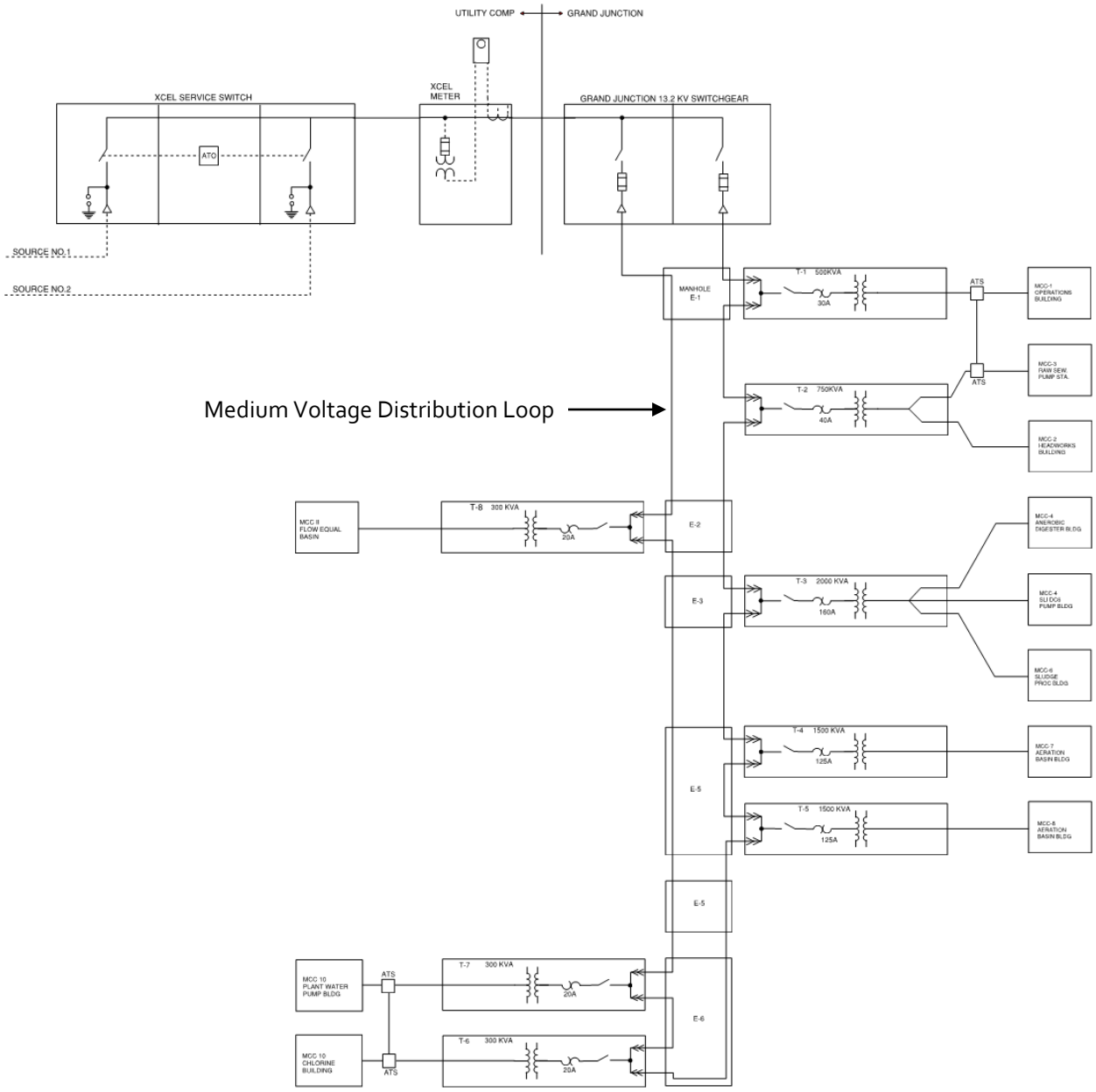

Figure 7.1 Existing Electrical One-Line Diagram

7.1.1.2 Loop Power Distribution

The outdoor primary switchgear provides power to the primary medium voltage loop. The loop routes through the plant's duct bank system to step-down transformers at various points in the facility. A diagram of the routing including the manholes it passes through is shown in Figure 7.1.

The cables for the medium voltage loop were part of the original installation in 1981 and reported to be submerged under groundwater throughout the year. No failures have been reported or recorded to this point. One consideration for the loop conductors is that both ends of the loop route through the same duct bank, and through the same manholes. This is not ideal because a single failure in a manhole or duct bank (fault condition, accidently damaged while digging, etc.) can cause a complete outage of the facility.

Considering the age of the conductors and the reliability concerns of the routing, planning for replacement of the medium voltage loop conductors is recommended. As part of the replacement, the design criteria should include a new path for the conductors that will ensure that the loops are not in a single point of failure (common manhole or common duct bank). Additionally, the loop system would provide an opportunity to have spare conduits to accommodate a fiber backbone ring for the facility's communications system discussed more in Section 7.2.

Installation of the new medium voltage power distribution loop requires coordination between on-going projects and operations to ensure sequencing does not cause service interruptions and ultimately discharge permit violations. Installing the new power distribution loop requires redundant duct banks and assumes the existing electrical distribution system would be maintained. Figure 7.2 illustrates a proposed routing for the new electrical duct bank, which would include both electrical cabling and fiber to provide a networked facility. A capital cost estimate has been provided in Appendix G.

7.1.2 Standby Generation

As described above, the facility has two electric utility sources that power the main facilities on-site through a medium voltage loop. In addition to dual utility sources, there are stationary diesel back-up generators dedicated to Raw Water Pumping and Headworks. In the event that both utility sources are lost, water can still be pumped through the plant. Plant staff noted that the raw water generator can support up to two Raw Water Pumps concurrently (of the five installed).

Staff noted that the generators are in reasonably good condition with no major concerns. Currently, the generators are operated weekly, but there is no regular load testing performed. To bring the generators up to operating temperature, and for the overall health of the machine, the manufacturers and National Fire Protection Association (NFPA) 110 recommend operating the generators under load at least twice a year. This can be done by using plant loads if available, or by load bank testing. It is recommended that the facility develop a regular load testing schedule for the generators.

7.1.2.1 Additional Standby Generator Needs

Facility staff indicated that the current electrical system is adequately reliable with the redundant feeders to the facility site. However, on-site generation would be beneficial at the disinfection building, which supports the UV system. Providing on-site generation will allow the staff to maintain disinfection during extended outages, which is critical to discharge permit compliance and maintaining service.

7.1.3 Medium Voltage Transformers

Throughout the facility, step-down transformers are present to reduce the voltage from 13.2 kilovolts (kV) to 480 V). As the existing electrical one-line diagram in Figure 7.1 shows, each building or process area can be fed from either side of the medium voltage loop. In total, there are eight transformers as shown on Figure 7.1.

Over the years, the staff has proactively replacement and maintained the pad mount transformers on site. As part of the current maintenance procedures, the transformer oil is tested regularly. Carollo recommends that the staff continue to test the transformer oil and trend for transformer replacements, especially on the transformers that have not been replaced.

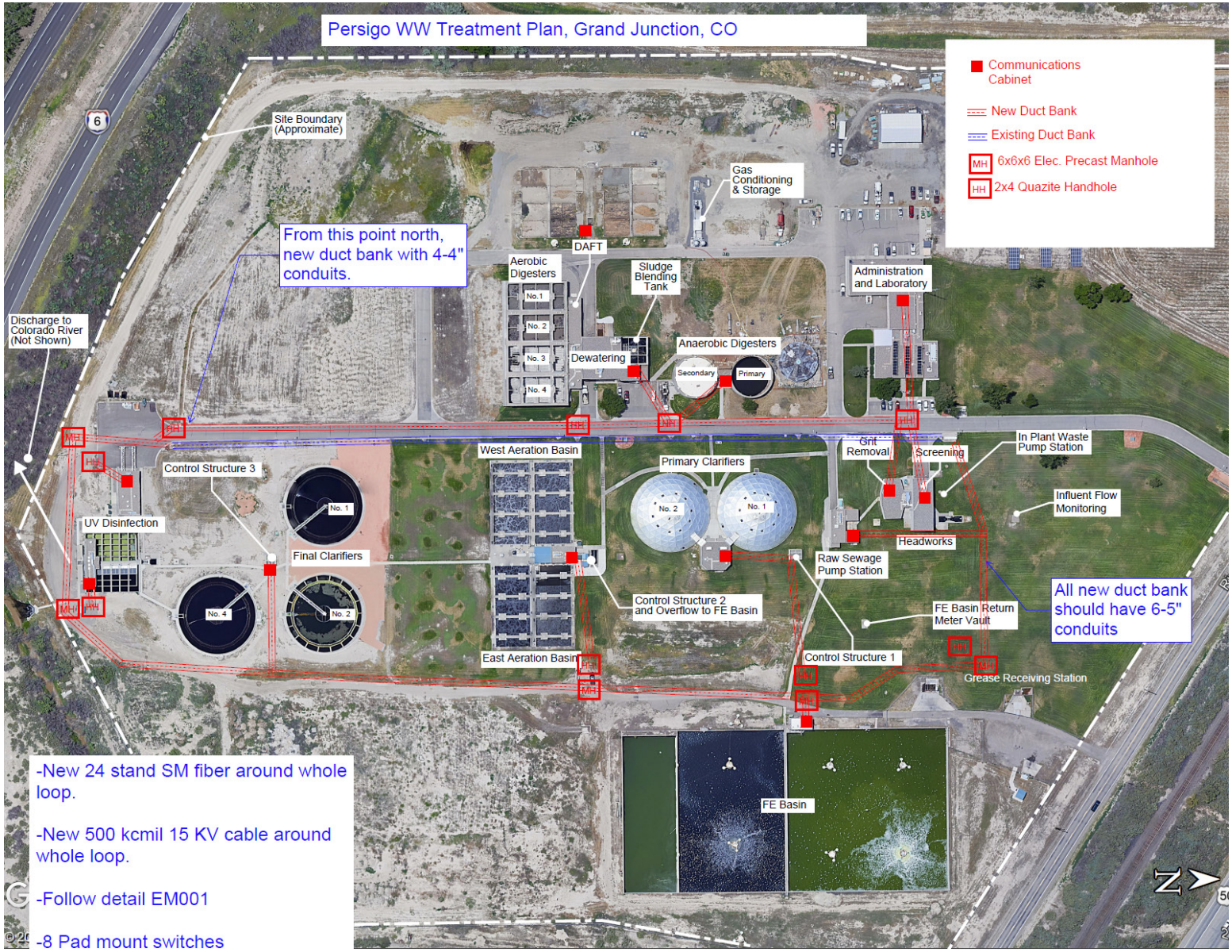

Figure 7.2 Proposed Routing for New Electrical Duct Bank

During the facility site visit, the transformer at the Administration Building was observed to be original equipment and may be leaking oil as shown in Figure 7.3. This transformer should be considered for replacement in the near-term and may be combined with the Administration Building upgrades or Medium Voltage distribution loop Projects.

When asked, the staff confirmed that many of the transformers on site have internal fusing. However, there are no records of which transformers have the internal fusing, nor the replacement fuse sizes. The existing fuse sizes for each transformer should be identified and spare fuses of each size should be kept on site for quick replacement. Additionally, the City should consider an on-call contract with a company that can help replace the fuses or invest in the proper training and equipment for staff to be able to replace fuses.

Figure 7.3 Administration Building Transformer

7.1.4 Low Voltage Distribution and Equipment

7.1.4.1 Motor Control Centers

There have been a number of MCC replacements over the years. However, there are still a few original MCCs on-site that are past their recommended useful life, and other MCCs that are installed in harsh environments and are recommended to be replaced even though they are newer. MCCs that are recommended for replacement include:

- Flow Equalization (EQ) Building.
- Headworks.
- Administration Building.
- Primary Clarifier Building.
- Blower Building.
  Replacement of the existing MCCs in the Blower Building is recommended. However, this 2020 Master Plan also recommends a complete replacement of the Blower Building for equipment and process reasons. As such, the replacement or upgrades to the existing Blower Building MCC needs to be evaluated to maintain secondary sludge (RAS and WAS pumping) operations in the basement of the existing Blower Building. Additionally, the controls upgrades/replacement should be coordinated and sequenced with the replacement of the Blower Building.
- Old Chlorine Building.

In addition to the MCC replacement, it is important to consider environmental improvements as well. If the City is going to invest in the replacement of the MCC, it makes sense to also invest in improvements to the environmental conditions to ensure longevity of the equipment. Some considerations noted from the site investigation include:

1. Headworks Electrical Room:
   a. Ventilation is poor and the room is located adjacent to classified spaces. Conduct NFPA 820 evaluation and modify the electrical room accordingly. Implement heating, ventilation, and air conditioning (HVAC) improvements to increase air flow and consider isolation from classified air spaces to increase MCC life expectancy.

2. Primary Clarifier Electrical Room:
    a. Ventilation is poor and room is located adjacent to classified spaces. Conduct NFPA 820 evaluation and modify the electrical room accordingly. Implement HVAC improvements to increase air flow and consider isolation from classified air spaces to increase MCC life expectancy.
    b. There appear to be potential roof leaks above the MCC as well. The building roof should be inspected and repaired as necessary to improve protection for the MCC.
3. Administration Building:
    a. The MCC is located in the walkway of the Administration Building. Recommend relocating and isolating so that staff are not exposed to the electrical hazards of 480 VAC electrical equipment.
4. Old Chlorine Building:
    a. The building's purpose has changed over the last several years. Consider replacement with equipment that is less expensive and adequate for the new purpose of the building.
5. Flow EQ Building:
    a. The future floating mixer replacement project identified as an asset replacement project in Chapter 4 could have an impact on electrical improvements if alternative technologies are used.
    b. Significant corrosion was also identified on the EQ Return Vault electrical infrastructure. This should also be considered for replacement after the future EQ basin plans have been finalized.

When considering building upgrades and equipment replacement, also consider access and space around the equipment. One concern is that currently, many facilities utilize the space around electrical equipment for storage. This is a violation of National Electric Code requirements and alternate storage methods and locations should be considered for the electrical spaces. In Chapter 8, it is recommended a storage and personnel space allocation and programming evaluation be completed to address these storage concerns.

Another consideration is trying to limit unqualified staff from having to interact or be around the power distribution equipment. There are design concepts such as separating the PLC controls by placing them in a different room from the power distribution equipment that can reduce interactions with unqualified staff to improve safety on site.

In addition to the environmental considerations, it is also important to note that today's MCCs are available with many different features, including but not limited to:

- Power metering.
- Networked or "intelligent" motor starters.
- Arc flash preventative equipment.
- Absence of voltage measurements.
- Remote controls, etc.

The City should review available features and consider defining standards to be implemented at all City facilities when replacing major electrical equipment such as the MCCs. These features are always evolving, and it is ideal to be consistent with replacements to the extent possible.

7.1.4.2 Ancillary Electrical Equipment

Corrosion concerns are common among many wastewater plant processes. The gas vapors associated with wastewater coupled with poor ventilation can create a harsh environment for electrical equipment, conductors, lighting, etc. Several facilities visited are seeing visual corrosion, as well as frequent failures due to the environmental conditions. It is recommended that while conducting the MCC replacements noted

above, the conductors, conduits, lighting, and other miscellaneous boxes and components be evaluated and replaced as well.

While it is ideal to replace all the electrical in a building or process at one time, it can also be costly. To prioritize investments, it is recommended to start with replacing critical equipment, like the MCCs, and main feeders, then budget for other electrical improvements for future CIP projects.

7.1.4.3 Raw Water Pump Station Electrical Room

Currently, the raw water pump station Electrical Room houses the MCC, a switchboard distribution panel, and a control enclosure, which has the PLC as well as the raw water pump VFDs. Failures have occurred within the switchboard, and the VFD cabinet is experiencing issues with overheating.

To address the corrosive atmosphere and failures noted above, the following steps are recommended:

- Remove the switchboard.
- Separate the VFDs from the PLC enclosure.
- Install new PLC cabinet.
- Redesign HVAC system for the Electrical Room.

Completing these equipment replacements and implementing a properly designed HVAC system will increase the reliability and the life expectancy of the equipment in one of the most critical areas of the plant.

Additionally, the power meter installed in the existing MCC appears to be metering negative values. The meter should be investigated and verified that the polarity is correct on the current transformers.

7.1.4.4 Blower Building General Upgrades

The staff have identified several concerns with the aging electrical equipment in the Blower Building. The age coupled with the many modifications to date (see photo of modified control panel in Figure 7.4), equipment overheating, power quality issues below, and performance concerns of the process, replacements to the electrical and control systems are recommended. However, a complete Blower Building replacement is identified in this 2020 Master Plan. As such, replacement of the electrical system should be completed as part of the Blower Building replacement project.

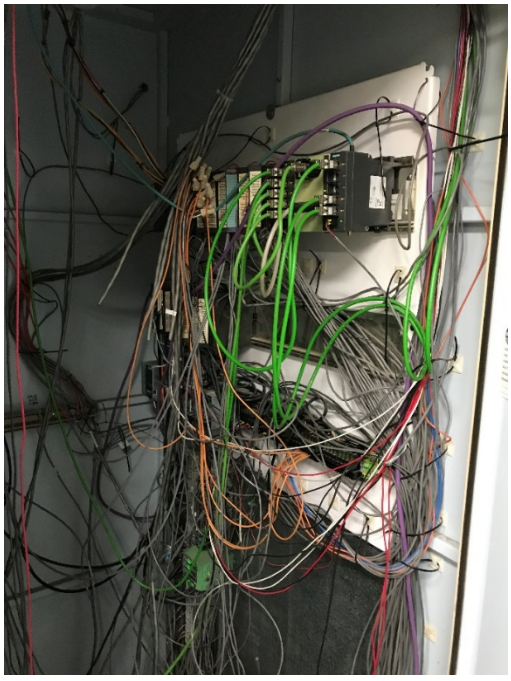

Figure 7.4 Blower Building Control Panel

7.1.4.5 Plant Variable Frequency Drives

Power quality concerns have been identified by the staff during blower operation. It is primarily noticed when the VFD for the 400-hp blower is operational. Upon starting and operating, lights are noted to flicker during VFD operation. Additionally, the large drives for the BFP process are on 6-pulse VFDs without any filtering.

VFDs generate electrical noise on the electrical system called harmonics. When severe enough, they can cause issues with lighting, extra heating in electrical components, and even equipment failures. When there are a large number of VFDs on an electrical system or high hp rated VFDs, harmonic mitigation is needed to maintain the stability of the electrical system. To address the current power quality concerns and future issues in the electrical system, addition of harmonic filtering to the Blower Building replacement project is recommended. A harmonic analysis is also recommended to determine other locations in the plant where harmonic mitigation is warranted.

7.1.5 Lift Stations

The City Owns and operates 26 lift stations throughout the collection system. The lift station design varies between three different layouts:

- Above ground.
- Partially above and partially below ground.
- Below ground.

The City is steadily replacing the below ground lift stations as these are older and have confined space concerns.

The newer lift stations have been installed with electrical labeling and have design drawings available for troubleshooting. However, many of the existing pump stations are missing labeling and have no record documentation. Additionally, many of the lift stations do not appear to properly address NFPA 820 which has specific continuous ventilation requirements to handle classified spaces as well as specific equipment ratings for classified areas. It is recommended that the lift stations be evaluated for conformance to current NFPA 820 requirements and the City maintain or develop record documents for all lift stations.

The lift stations currently communicate over a license-free, spread spectrum, 900 megahertz (MHz) radio system. The existing radio system is obsolete, becoming unsupported, thus it is not reliable and requires constant maintenance/attention. The City started investigating different options for cellular communications. The remote facilities should be connected to a secured cellular network. This cellular approach could be managed by the City or using a third-party provider.

For cellular communication, the City staff has been working with manufacturers to price and determine opportunities to connect the remote assets and provide real-time data and dashboards through a cloud service for City use. This would provide immediate resolution and connection to the remote facilities. Using a third party would also likely result in the lowest near-term costs; however, there are likely to be long-term management and annual fees associated with the third-party approach.

7.1.6 Recommended Capital Improvement Projects

Table 7.1 shows the recommended capital improvement projects to address the electrical infrastructure. Project costs are shown in 2021 dollars. Some of these projects have been captured in Chapter 4 Asset Replacement Projects. As a result, most of these identified projects will not be included as stand-alone projects in the implementation plan.

Table 7.1 Recommended Electrical System Improvements

Implementation Period	Identified Projects	Capital Costs (2021 $)
2021-2025	1. Medium voltage loop and fiber ring installation.	$7.1 million
	2. MCC replacements (for the six identified above) and associated electrical equipment replacement.	$350,000 per MCC $2,100,000 total
	3. Administration Building transformer replacement.	$500,000
	4. Headworks Electrical Room improvements.	Costs included in Chapter 4 Asset Revitalization Projects
	5. Raw Water Pump Station Electrical Room improvements.	
	6. Primary Clarifier Electrical Room improvements.	
	7. Flow EQ basin and return vault electrical replacement.	
	8. Generator addition to UV Building.	
	9. Harmonic study and plant VFD upgrades/replacement.	
2026-2030	1. Electrical system studies.	$100,000
	2. Miscellaneous electrical improvement projects for unit process areas and site electrical.	Included as allowance with identified projects
2031-2040	1. MCC replacements (future – assume 5).	$350,000 per MCC $1,750,000 total
	2. Electrical system studies.	$150,000
	3. Transformer and switchgear replacements (future allowance).	$1,500,000 every 5 years

7.2 Instrumentation and Controls

The Persigo WWTP focuses on providing the appropriate level of instrumentation for the right application. As treatment processes and instrumentation evolve, the organization will confirm that implemented new technologies make sense financially and are appropriate for the facility staffing requirements. To date, the facility's design philosophy has been and should continue to be focused on using the best available technologies to provide more precise, robust, reliable control and require less operator intervention in process control.

The existing Siemens SCADA system is maintained with in-house SCADA technicians. There is local support in the greater Grand Junction area by Siemens and other integrators to support the Persigo WWTP staff with troubleshooting and implementing software upgrades.

7.2.1 Organizational I&C Vision

In order to understand the future direction, a visioning exercise was completed through a series of facilitated discussions with Persigo WWTP and City staff. In developing and understanding the existing SCADA and business networks, a network architectural diagram was created. Figure 7.5 illustrates Carollo's understanding of the current network configurations at the Persigo WWTP.

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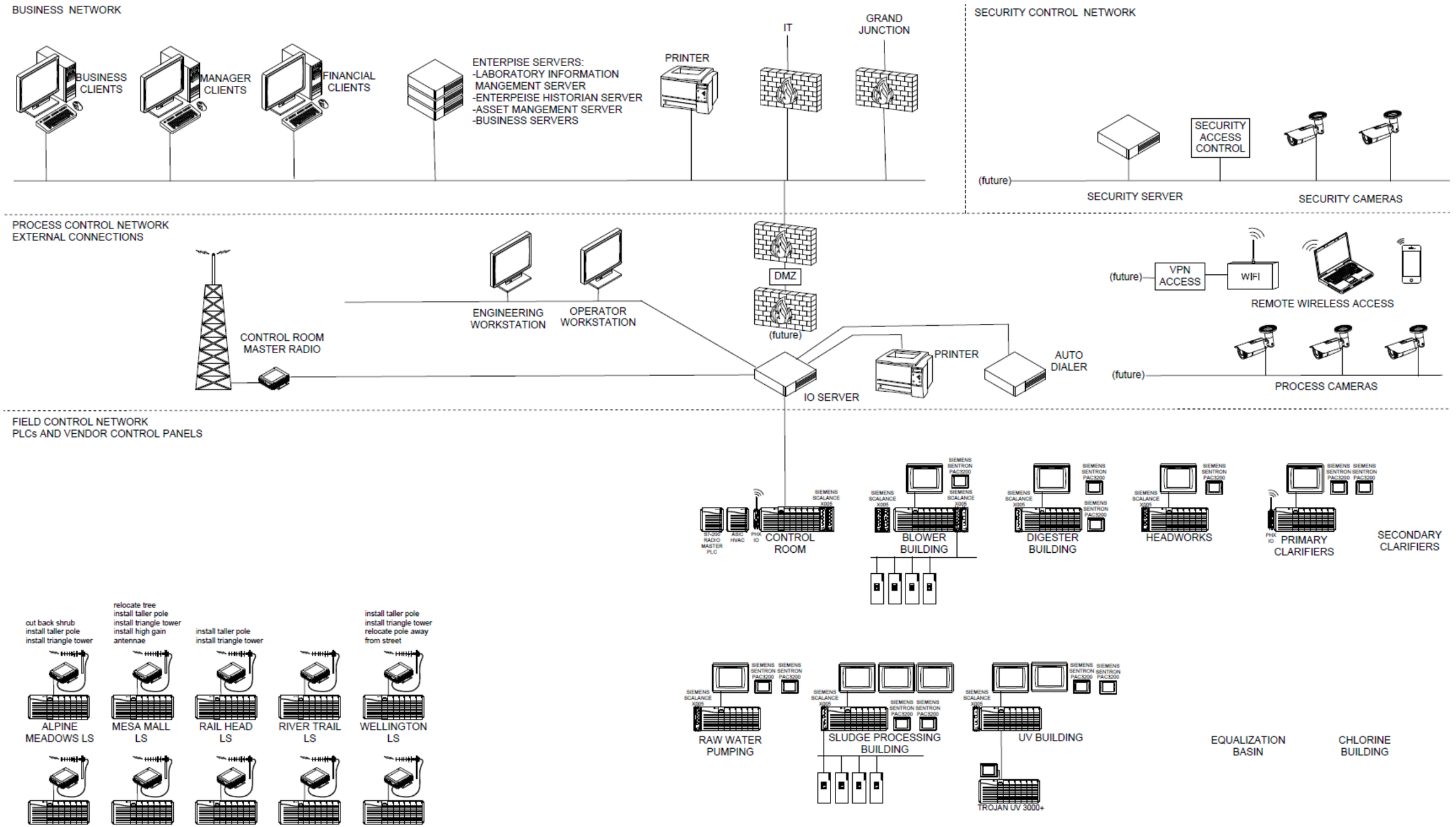

Figure 7.5 Persigo WWTP Current Network Diagram

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Figure 7.6 illustrates the eight different policy areas that were discussed during the I&C visioning exercises. By understanding the current network architecture and the City's vision, the following themes and recommendations were established.

Figure 7.6 I&C Policy Areas Discussed

1. **Operational / Staffing Needs –** The Persigo WWTP staff would like to have the ability to monitor and control operations remotely. As technologies and level of instrumentation increase, the Persigo WWTP staff will need to increase the headcount and number of I&C staff (instrument technicians, SCADA/network managers, etc.).
2. **IT Security –** The City will be managing security requirements and should be modeled after industry standards such as America's Water Infrastructure Act (AIWA) or American Water Works Association (AWWA) cyber security standards. City and Persigo WWTP staff should implement security protocols prior to implementing cellular improvements for the lift stations.
3. **City IT Staff** – The City IT staff will support the Persigo WWTP networks and can be used as a resource. It is assumed the process control and human-machine interface (HMI) networks will remain the responsibility of the Persigo WWTP staff.
4. **Process Monitoring / Controls –** The Siemens PLCs have been used and maintained through the years. Per Persigo WWTP staff, these PLCs have been easy to use and support has been available when needed. Connecting these PLCs to a fiber network will improve the data transfer and use needed.
5. **Alarm Management –** Improvements to the alarm management needs to be evaluated in the future as there are a number of alarms received and staff would like the ability to address remotely.
6. **Data Management –** Improved data management will take a coordinated effort with the City IT to ensure server space is available for the data historian and data analytic platforms desired. The City may evaluate the use of cloud-based servers to minimize capital investments. Data access and management will be greatly enhanced with the installation of a fiber network.
7. **Reporting –** The City should invest in developing dashboard and reporting software to simplify the process for developing, submitting, and analyzing process and financial reports.

7.2.2 Instrumentation

The Persigo WWTP has invested in functional instrumentation appropriate for the level of treatment required. However, as treatment processes change and evolve, the staff will be challenged to continue deploying new instruments and invest in additional instruments and controls that will add to the reliability of the plant's automation strategy and enable Operators to better control the plant 24/7 with enhanced functionality for remote operations. These investments will increase the facilities' efficiency and improve operational performance and controls.

No specific instrumentation deficiencies were identified during the project development. However, each project identified has an allowance for evaluating and implementing instrumentation. A key area to focus on increased IC is the flow management in the flow EQ basins and the aeration basins. In addition, when replacing MCCs and electrical equipment, the City should evaluate the use of smart-MCCs and power measurement throughout the facility.

7.2.3 Control Hardware and Software

The I&C visioning recommended the following instrumentation and control upgrades.

- Evaluate the Persigo WWTP SCADA HMI software and operator interface to ensure it meets the growing needs for remote 24/7 monitoring with base level control. Consider high-performance HMI graphics development for future upgrades.
- Upgrade the process alarm features and notification systems and procedures in the SCADA systems.
- Evaluate the Persigo WWTP facilities, duct banks, and site plan for deployment of a plant-wide, industrial Ethernet network.
- Evaluate and upgrade the Persigo WWTP and lift station PLC control network as infrastructure reaches end of useful life. Recommend completing a SCADA Upgrades Study, which will identify the technology, manufacturer, and additional functionality needed from the SCADA system.
- Retire the radio communications and move towards a cellular network for the Persigo WWTP lift station controls, and remote facilities.

The plant staff indicated the existing Siemens SCADA system functions well and the plant has proactively replaced and maintained the Siemens SCADA system and PLCs. A software upgrade would be recommended to modernize the SCADA system. However, at this point, a complete overhaul or change of SCADA platforms is not recommended. The Siemens SCADA system is one of the top five systems implemented in the United States. The City should develop a technical support or on-call contract with a Siemens certified programmer to support the Persigo WWTP staff with integration of new capital projects into the existing SCADA platform.

A multi-faceted SCADA Upgrades Study is suggested. This study will serve as a long-term implementation approach for evaluating the security, reliability, and responsibilities of the overall network infrastructure and control system. As part of the SCADA Upgrades Study, the Persigo WWTP should consider conducting a facility-wide cyber security audit, implementing a plant-wide industrial Ethernet network, and developing a responsible approach to achieve enhanced remote monitoring and operations. Looking to the future, regular reviews of new technologies are essential to making the Persigo WWTP system more robust and efficient. Adding a recurring SCADA Upgrades Study effort every 5 to 8 years is recommended to maintain perspective on new/evolving technology.

Control panels are one of the more expensive assets to account for in this project. Many of the hardware components in the facility's area process control cabinets are becoming obsolete. Upgrading control panels can be completed on a project-by-project basis or as a separate project. This replacement approach should

be further defined in a future SCADA Upgrade Study. For master planning purposes, a budgetary line item for PLC replacements will be added to the capital schedule.

7.2.4 Data Management

As part of the IC Visioning, it was recommended to complete a data mapping exercise to better understand the functionality of each data system and better streamline the use, management, and presentation of data. This would include analyzing your laboratory information system, the operations data, SCADA network, Lucity database, business network/financial information, and process control data and reports.

7.2.5 Process Control Center

The existing process control center does not meet the security and staffing needs for the Persigo WWTP. As a result, Carollo recommends building a security process control center and increasing the number of workstations for operators to monitor treatment plant activities. This process control center is assumed to be included in the existing administration building improvements. The SCADA Upgrades Study will further identify the requirements and types of audio-visual equipment required for the control room.

Additionally, it is considered best practice to have a redundant location located off-site to operate the treatment facility in the event of an emergency. This facility would have a redundant data center and connection to the process network. Carollo recommends constructing a secondary process control location and backup data center at another City owned facility to provide this service.

7.2.6 Recommended Capital Improvement Projects

Table 7.2 lists the recommended CIPs for the instrumentation and controls systems.

Table 7.2 Recommended Instrumentation and Controls System Improvements

Implementation Period	Identified Projects	Capital Costs (2021 $)
2021-2025	Industrial fiber installation at Persigo WWTP installed with new MV electrical distribution system as discussed in Table 7.1.	Included above
	SCADA Upgrades Study with cyber-security assessment.	$150,000
	Connect lift stations and remote assets to cellular network and retire radio communications.	$200,000
	PLC Replacement Program (annual cost – 1 per year).	$150,000
	Upgrade the Persigo WWTP SCADA HMI, alarming, call-out/paging software and operator hardware.	$125,000
2026-2030	Continuous IT master planning.	$200,000
	Security improvements (access control, video surveillance, etc.).	$250,000
	Redundant Data Center infrastructure.	$125,000
	Upgrade lift station controllers to newer PLC (included as part of lift station upgrades).	NA
	Replacement of PLCs and control panels (annual allowance).	$200,000
2031-2040	Replacement of PLCs and control panels (annual allowance).	$200,000

7.3 Site Security

The site is secured by a perimeter fence and a gate entry access system. Inside the facility, security is limited. After implementation of a fiber loop, a security evaluation is recommended to consider the installation of cameras and an access system for each building.

To improve the access control and visibility, it is recommended that the front gate and the septic receiving station both have surveillance cameras installed.

In October 2018, the United States Congress signed into law the AWIA. The AWIA focuses on drinking water systems and is not explicitly required for WWTP. It is recommended, as good practice, that WWTP facilities conduct a Risk and Resilience Assessment to understand the physical and cyber threats that could impact the safety of the Persigo WWTP staff and the operations of the facility.

7.4 Site Utilities (Natural Gas, Potable, and Plant Water)

The Persigo WWTP site has underground utilities, which include natural gas service provided by Xcel and potable water service provided by the City. In addition, the facility has a distribution network of non-potable water owned and operated by the Persigo WWTP.

7.4.1 Natural Gas

Xcel provides natural gas to the Persigo WWTP and maintains the natural gas piping to each facility. According to Persigo staff, the distribution gas piping on the Persigo WWTP site were recently updated by Xcel and there are no known improvements needed. This 2020 Master Plan assumes since Xcel owns the natural gas piping, future replacement or rehabilitation will be Xcel's responsibility.

7.4.2 Potable Water Systems

Ute Water provides potable water to the Persigo WWTP site. According to staff, the existing potable water system is adequate for all current and anticipated process needs, and no expansions or improvements are necessary.

7.4.3 Non-Potable Water System

The Persigo WWTP has a non-potable water system used for process water and irrigation uses around the facility site. Disinfected secondary effluent is pumped and provides non-potable water to the system at approximately 80 psi. The pump station includes three vertical turbine pumps at 600 gpm and one vertical turbine pump at 320 gpm.

The replacement or rehabilitation needs for the plant water system were identified as part of the Disinfection Building improvements as identified in Chapter 4.

7.4.4 Recommended Capital Improvement Projects

No specific asset revitalization projects were identified for the gas, potable, and non-potable water systems.

7.5 Administration Building

The existing Administration Building is over 40 years old and requires improvements to address the following:

1. Modernize the facility to meet current code requirements, enhance operational safety, and security.
2. Replace aging assets to improve building operations and efficiencies.
3. Increased staffing levels and assumed growth in staffing for the future requires additional workspaces and resources.
4. Provide dedicated area for the plant SCADA control center.

The following near-term projects or improvements to the Administration Building have been identified and included in the implementation plan.

7.5.1 Modernization and Expansion of Administration Building

Improvements to modernize and increase capacity of the existing facilities in order to address staffing and additional maintenance space have been identified as follows.

1. Contract with an Architectural Engineering firm to complete a plant-wide personnel and facilities storage architectural programming study. This will refine and update the long-term plans and budgetary numbers for the laboratory space and storage facilities across the plant. Storage facilities across the plant and inside the Administration Building will become a priority as additional staffing or office remodels occur.
2. Create an updated control room with updated control stations, central monitoring point, and improved security to room. This area should have one central common station along with four additional workstations. Assume workstations would be open concept with potential cubicle walls creating separation, as needed.
3. Modernize the entry way to accommodate larger groups and create shared workstations for floating staff or individuals not requiring office space.
4. Remodel the laboratory office space to create one office and two workstations in the existing footprint. Improve and replace existing HVAC systems in the laboratory area and for the building.
5. Replace and relocate the existing electrical equipment or improve the safety levels associated with the electrical equipment.
6. Provide up to up to seven enclosed offices based on discussions with Persigo WWTP staff for following roles: Plant Manager, Supervisors (three - Collection, Maintenance, Operations), office space for use by City engineers or staff, future biosolids management role or septic elimination program role, and a future office space. Adding these spaces to the Administration Building will require additional planning and determination of space can be configured to accommodate these additional enclosed offices. Potential considerations for providing additional office space:
    a. Relocate items in storage spaces to other buildings on-site.
    b. Re-purpose the kitchen area and relocate kitchen facilities to existing patio/breezeway.
    c. Provide temporary trailer to accommodate the additional spaces needed, or
    d. Expand the storage/maintenance facility to the north of the Administration Building to add personnel offices.
7. Improvements to the maintenance facilities include adding bench space, which could be accommodated by moving storage items or less used equipment to adjacent storage areas on the plant.
8. Additionally, as the City's collection system maintenance requirements increase, an additional jetter truck will be needed. To provide additional space for storage and cleaning of this additional equipment, another truck bay is recommended.

To achieve the goals and improvements listed above and shown in Figure 7.7, additional storage space has been planned to be constructed adjacent to the existing storage building to the north of the Administration Building. Figure 7.8 illustrates the intended expansion to provide additional office spaces, storage area (for supplies, files, and equipment), and includes truck bay for future jetter truck.

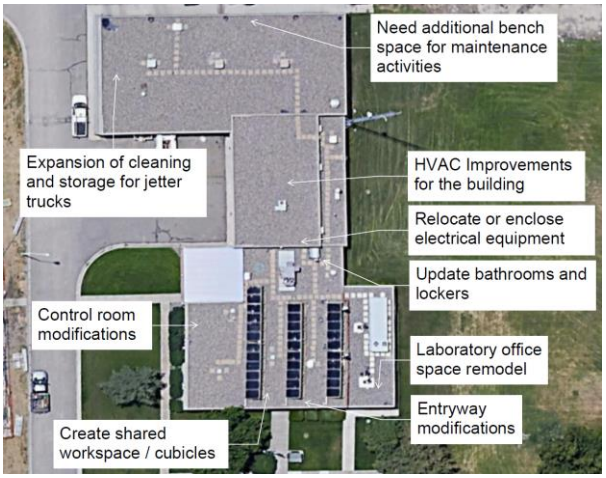

Figure 7.7 Recommended Improvements to Administration Building

Figure 7.8 Additional Storage Facility

7.5.2 Recommended Capital Improvement Projects

Table 7.3 lists the recommended capital improvements for the Support Facility Building improvements carried forward into the CIP.

Table 7.3 Recommended Capital Improvements for Support Facility Building

Implementation Period	Identified Projects	Capital Costs (2021 $)
2021-2025	Personnel and Storage Facilities Master Plan.	$75,000
	Administration Building improvements and storage facility.	$2,500,000
2026-2030	None identified.	
2031-2040	Renovate laboratory space and other facilities or construct new Administration Building.(1)	NA

Notes:
(1) Assumed the long-term vision for the laboratory space and entire Administration Building would be evaluated by the architectural consultant that completes the Administration Building repairs project.

7.6 Yard Piping

A detailed assessment of the yard piping condition was not performed as part of this 2020 Master Plan. A project to complete a condition assessment or survey of the buried yard piping is recommended to develop mitigation strategies for reducing pipeline failure events. The evaluation phase could include closed-circuit television (CCTV), soil corrosivity testing, and electromagnetic testing.

The original pipelines have reached 40 years of life expectancy and may require rehabilitation to preserve the pipeline integrity and to avoid pipeline failures. A pipeline rehabilitation allowance was established to allocate future funding to rehabilitate existing pipelines.

7.7 Site/Civil Improvements

Table 7.4 shows the recommended capital improvement projects to address yard piping and site/civil improvements. Project costs are shown in 2021 dollars. Annual budget allocation should be made to repair and replace aging asphalt, concrete sidewalk, curb and gutters, and general landscaping improvements. It is assumed these re-occurring budgeting items would be categorized as part of the Annual Operations Budget and not included in the capital improvement plan.

Table 7.4 Summary of Yard Piping and Site/Civil Improvements

Implementation Period	Identified Projects	Capital Costs (2021 $)
2021-2025	Civil improvements (annually).	$50,000
	Pipeline inspection program.	$200,000
2026-2030	Civil improvements (annually).	$75,000
2031-2040	Civil improvements (annually)..	$100,000
	Pipeline rehabilitation allowance	$5,000,000

7.8 Energy Baseline

The Persigo WWTP receives electrical power from Xcel Energy under the Commercial and Industrial Primary Service – Primary General tariff. After reviewing 2 years of Xcel electrical bills from January 2018 through December 2019, the following observations were developed.

1. The peak electrical demand expressed as highest kilowatt (kW) use over a 15-minute period was less than 950 kW. The variation of these demands month to month was less than 8 percent.
2. The electrical energy used, expressed as kWh, was less than 7,000,000 kWh for the year. Electrical use during the winter months were 15 to 20 percent higher than the summer months, which is likely a result of the facility heating demands.

Benchmarking energy use against other utilities can be challenging due to the differences in electrical tariffs, discharge permits, treatment processes, and operational goals. However, NACWA publishes benchmarking data for over 130 wastewater utilities. Based on the data from 2018, the following statistics provide a comparison to the Persigo WWTP facility.

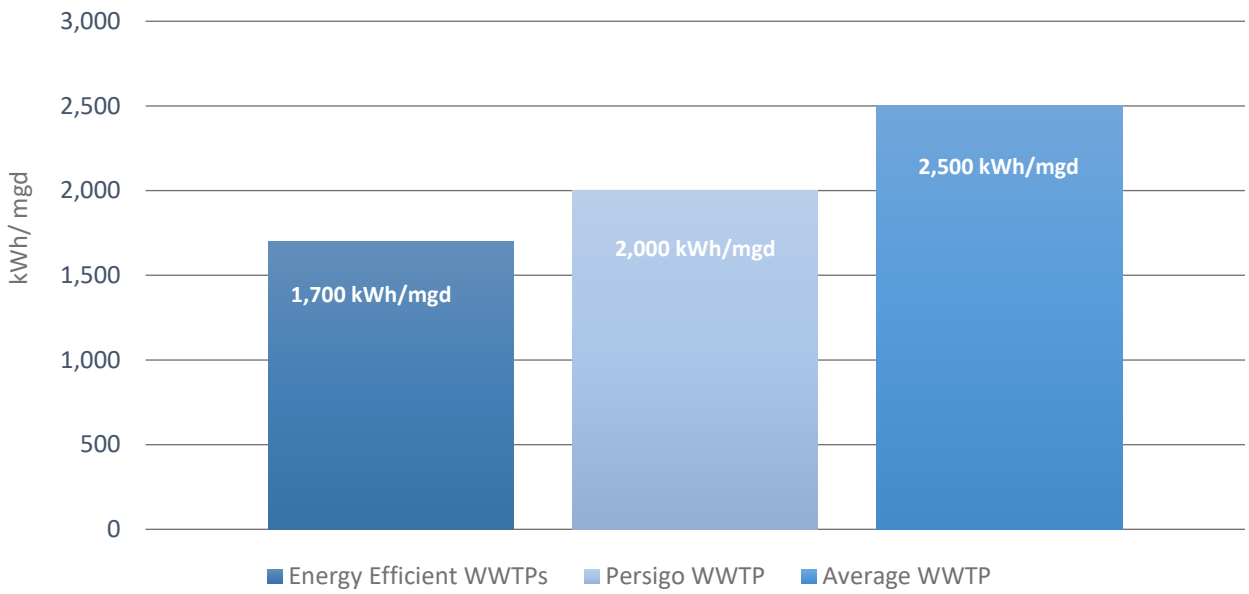

Figure 7.9 Comparison of Persigo WWTP Energy Use to Average and Energy Efficient Utilities (NACWA, 2018)

The Persigo WWTP is more efficient than the average wastewater utility. Further reductions in energy use will occur based on the recommendations provided in Chapter 5. The recommended improvements in Chapter 5 which will have the biggest impact in reducing the electrical use include:

- Replacing the existing blowers used in the activated sludge process with higher efficiency technologies will reduce the aeration electrical use significantly.
- Converting to an anaerobic digestion process will eliminate the aeration requirements for aerobic digestion.
- Upgrading existing heating and ventilation equipment using more efficient equipment and controls.

7.8.1.1 Electrical Submetering

Measuring the electrical use by each facility at the MCCs can be incorporated when replacing and upgrading the existing MCCs. Submetering is recommended in the following areas to better optimize electrical use and eventually provide the data for real-time operational control based on energy use and costs.

1. Raw sewage pumping.
2. Aeration basins.
3. Disinfection Facility/Plant Water Station.
4. Sludge Processing Building.
5. Administration Building.

7.9 Renewable Energy – Photovoltaic Systems

Solar energy is a viable, available, and affordable resource in Colorado, with more than 300 days of sunshine a year. Photovoltaic (PV) systems require very little maintenance, are reliable, and produce energy during all daylight hours. PV systems are clean, providing renewable energy with no harmful greenhouse gas emissions and no noise, which make them good neighbors.

The Persigo WWTP currently has a 100-kW PV system that provides power to the Administration Building behind the meter. This PV system supplies less than 5-percent of the average energy consumption at the Persigo WWTP. Carollo evaluated locations to increase the amount of renewable energy produced through a PV system at the Persigo WWTP site. The Figure 7.9 illustrates five areas that addition PV systems could be added. For this analysis, it was assumed a ground mounted PV system would be the most economical approach due to the availability of space. Table 7.5 provides the size and financial information for each of these sites.

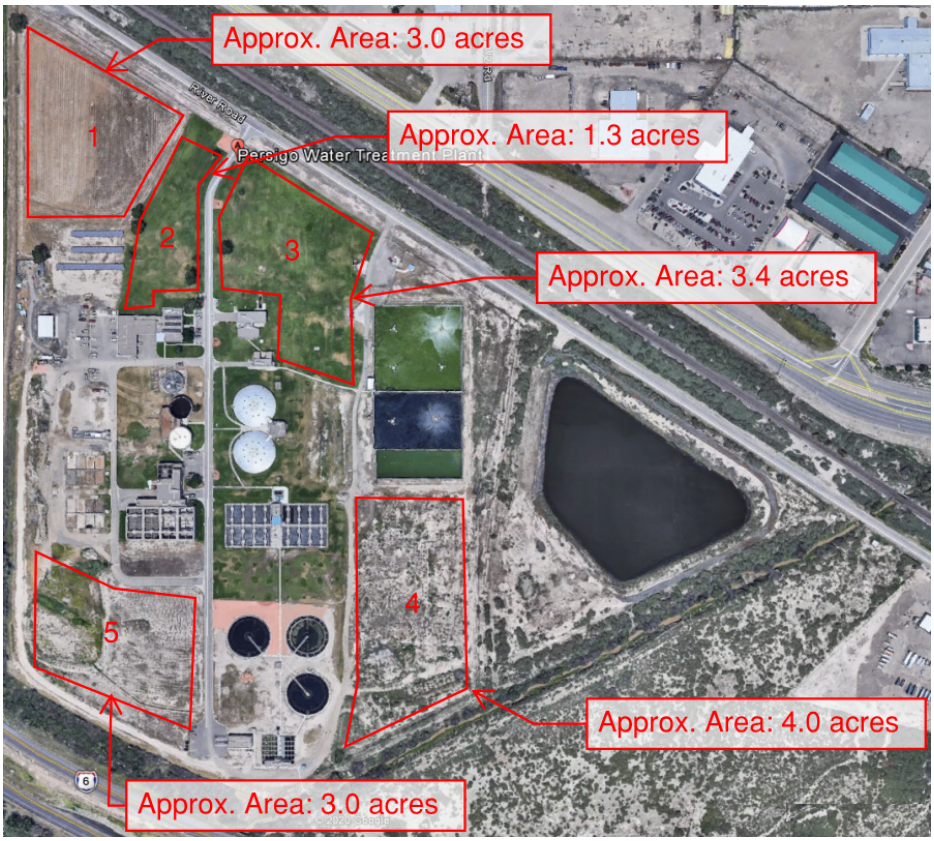

Figure 7.10 Locations for Future PV System

Table 7.5 PV Sizing and Financial Details

Site	Available Land (acres)	Size of PV System (kW)[1]	Energy Produced (kWh/year)[2]	Capital Costs ($)[3]	Annual Electrical Savings ($)[4]
1	3.0	900	1,685,000	$1,890,000	$101,000
2	1.3	390	730,000	$819,000	$44,000
3	3.4	1,020	1,910,000	$2,142,000	$115,000
4	4.0	1,200	2,247,000	$2,520,000	$135,000
5	3.0	900	1,685,000	$1,890,000	$101,000
Total	**14.7**	**4,410**	**8,257,000**	**$9,261,000**	**$495,000**

Notes:
(1) Size of the PV system assumes 300 kW/acre, which includes space for access.
(2) Amount of energy produced calculated using National Renewal Energy Laboratories (NREL) PV watts model for ground mounted single axis tracking system.
(3) Capital costs assume design, construction, and installation of PV system at $2.1/watt.
(4) Electrical savings calculated using $0.06/kWh.

Based on the financial analysis for installing a PV system only using City financing the estimated simple pay back is between 18 and 20 years. Depending on the City's energy management goals, there is adequate space available for the Persigo WWTP to produce excess energy and provide back to the electrical grid.

7.9.1.1 Battery Energy Storage System

The commercial availability and cost for energy storage systems has decreased dramatically in the past 5 years and will continue to decrease in the future. In water and wastewater applications, the most commonly used battery energy storage system (BESS) is a lithium ion battery. The BESS provides the system reliability, improves power quality, provides immediate response to instantaneous peak demands, and can reduce energy used for a longer period.

Most PV systems today will include a BESS to provide storage during periods of excess power generation. For the size and demands from the Persigo WWTP, the estimated BESS sizing would be between likely between a 250 kW/1 megawatt-hour (MWh) to 500 kW/2 MWh lithium ion battery system. The estimated installed capital costs for this system would be between $1,000,000 and 1,500,000. When combined with the PV analysis above, the simple payback period would be 15 to 18 years.

7.9.1.2 Equipment Replacement and Annual Maintenance Costs

PV panels typically have a 20- to 25-year manufacturer's warranty. Per manufacturer's published data, a typical panel will lose about 0.2 percent of its energy production output per year. PV systems are typically estimated to have a useful life of 25 years; however, there are installations installed greater than 25 years ago that operate at the reduced efficiency. The PV inverters and BESS systems have a lifespan of 10 to 15 years.

7.9.1.3 Solar Rewards / Incentive Options

Net metering is a utility billing mechanism that credits solar energy system owners for the electricity they over produce and sell back to the electrical grid. The utility customer is only billed for their "net" energy used. Net metering allows net excess generation (NEG) in a given month to be applied as a credit to the client's bill the following month. Every kWh of NEG shall produce a 1 kWh credit back to the customer on the future bill. At the end of the calendar year, if the customer's generation exceeds consumption, or if the customer terminates service, the utility must reimburse the customer for the NEG at the utility's average incremental cost over the most recent calendar year. The customer has a one-time option to request in writing that the NEG at the end of the calendar year be carried over from month to month indefinitely.

If using the Solar Rewards Standard offer, the NEG is sold back to the electrical utility at a rate dependent on the size of the system and type of customer. The maximum annual kWh of renewable energy that will be credited per Xcel Energy is a 2-MWh PV system. This needs to be confirmed with Xcel Energy. This incentive has not been included in the financial analysis to this point as it is undetermined how much renewable energy will be required to meet the electrical demands of the NTP.

7.9.1.4 Interconnection Costs

The interconnection costs depend on the PV system size, the incentive program enrolled in, and the required utility infrastructure improvements. Xcel Energy offers an evaluation study for a fee of $2,000 and will provide within 10 business days a rough order of magnitude pricing for interconnect.

7.9.1.5 Ownership Options

The current understanding and analysis provided assumes Persigo WWTP will own and operate the PV system. Other ownership options are dependent on the overall organizational energy management goals, site security and access, and if federal tax credits are available. Other ownership options include:

- Power purchase agreement with a third-party provider, or energy as a service, to construction and operate the PV system.
- Leasing agreement where Persigo WWTP could own the PV system in the future.
- Own the PV system and operate system as a community solar garden.

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