

Vernon CT WPCF Upgrade UV Disinfection System Equipment Pre-Selection

Contract # 2016 12/08/2017

Town of Vernon, Connecticut

November, 2017

Tighe&Bond

53 Southampton Rd
Westfield, MA 01085

**WPCF Upgrade Project
UV Disinfection System Equipment
Pre-Selection
Vernon, Connecticut
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DIVISION 0 - BIDDING AND CONTRACT REQUIREMENTS

SECTION 00100

ADVERTISEMENT FOR BIDS

TOWN OF VERNON CONNECTICUT
WPCF UPGRADE UV DISINFECTION SYSTEM

CONTRACT # 2016 12/08/2017

ADVERTISEMENT FOR BIDS

Sealed Bids for the UV Disinfection System equipment to be supplied as part of the “Town of Vernon CT Water Pollution Control Facility Upgrade Project” will be received at the Office of the Town Administrator, 3rd floor, 14 Park Place, Vernon, CT 06066 until 11:00 a.m. local time on December 8, 2017 at which time the Bids received will be publicly opened and read. Sealed Bids must have outer envelope marked as “Town of Vernon CT WPCF Upgrade UV Disinfection System Equipment Pre-Selection”.

The Town will select an equipment manufacturer to provide the UV Disinfection System equipment to be installed as part of a construction project to upgrade the Vernon Water Pollution Control Facility. The selected UV Disinfection System will be used as the basis of design and named in the final bid documents for the Town of Vernon CT Water Pollution Control Facility Upgrade Project. The successful bidder will be required to provide information requested by the Engineer to assist in preparation of the detailed design of the system for the construction Contract Documents. The Construction Contractor selected for this future project will be required to use the Successful Bidder’s equipment as a sole source at the fixed price given in the Bidding Documents. The Successful Bidder shall be required to deliver the specified equipment for the prices quoted in this Bid. If the upgrade construction contract is not awarded, the Owner will have no obligation to the Bidder.

This contract is expected to be funded in part by the State of Connecticut, Department of Energy and Environmental Protection. Neither the state, nor any of its departments, agencies, or employees is or will be a party to this contract or any lower tier subcontract. This contract is subject to the requirements of Section 22a-482 of the regulations of the Regulations of Connecticut State Agencies.

Bidding Documents may be obtained online from the Tighe & Bond website located at http://www.tighebond.com/Projects_Out_to_Bid.php. Prospective Bidders are required to register on the Tighe & Bond website to download Bidding Documents. Bidding Documents may be examined at the office of Tighe & Bond, Inc., 53 Southampton Road, Westfield, MA between the hours of 8:00 a.m. and 5:00 p.m., Monday through Friday, legal holidays excluded. Bidding Documents may also be examined at the Water Pollution Control Facility, 100 Windsorville Road, Vernon, CT between the hours of 7:00 a.m. and 3:00 p.m, Monday through Friday, legal holidays excluded. Questions for this bid can be directed to the Tighe & Bond website.

Bidders are encouraged to take water samples and conduct testing at the Vernon WPCF at their own expense. However, the WPCF upgrade project will eliminate the Zimpro PACT-WAR based secondary treatment system and, and it will be replaced with a 4/5 stage Bardenpho process, both of which will impact the plant effluent in a manner that may be material to the Bidder’s equipment.

No Bid may be withdrawn until October 1, 2019.

The project is subject to the American Iron and Steel (AIS) requirement of Section 436 of Public Law (P.L.) 113-76, Consolidated Appropriations Act, 2014. Section 00800 contains further information on applicable iron and steel products and compliance.

The Town reserves the right to waive any informality in or to reject any or all Bids, or to accept any Bid which in their opinion, is in the public interest to do so.

TOWN OF VERNON, CONNECTICUT

END OF SECTION

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SECTION 00200

INSTRUCTIONS TO BIDDERS

SECTION 00200

INSTRUCTIONS TO BIDDERS

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ARTICLE 1 DEFINED TERMS

- 1.1 Terms used in these Instructions to Bidders will have the meanings indicated in the General Conditions and Supplementary Conditions.

ARTICLE 2 BIDS RECIEVED

- 2.1 Refer to Advertisement for Bids for information on receipt of Bids.

ARTICLE 3 COPIES OF BIDDING DOCUMENTS

- 3.1 Refer to Advertisement for Bids for information on examination and procurement of documents.
- 3.2 Complete sets of Bidding Documents shall be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
- 3.1 Engineer will make available certain figures for use by Bidders in electronic AutoCAD (.dwg) format for the Bidder's use in preparing the Bidder's Bid. Such request shall be submitted in writing to the Engineer via e-mail at pamoran@tighebond.com and include the release form entitled "AGREEMENT FOR DELIVERY OF DOCUMENTS IN ELECTRONIC FORM" which is attached to this Section. Failure to request the AutoCAD files, provide a signed release form, or provide the requested Figures with the Bid may be used as justification for considering the Bid nonresponsive.
- 3.2 Owner and Engineer in making copies of Bidding Documents available on the above terms do so only for the purpose of obtaining Bids for the Goods and Special Services and do not confer a license or grant for any other use.

ARTICLE 4 QUALIFICATIONS OF BIDDERS

- 4.1 Bidder is advised to carefully review those portions of the Bid Form requiring Bidder's representations and certifications.
- 4.2 To demonstrate Bidder's qualifications to furnish the Goods and Special Services, each Bidder must submit with his bid a summary of their qualifications and other data as specified in Article 5 of the Bid Form (Section 00410).
- 4.3 Bidders shall have the minimum experience with wastewater ultraviolet disinfection systems, as listed in the Division 11 specification. Submit with the bid a summary of experience that shows compliance with these requirements. In lieu of compliance with the specified experience period, submit a bond or cash deposit (in the form of an irrevocable letter of credit) at the time of the Bid in the amount of the contract value to guarantee replacement in the event of failure which shall remain in effect for the minimum experience period listed in the Division 11 specification following substantial completion of the WPCF upgrade anticipated to be on or about July 2022.
- 4.4 Bidders may be investigated by Owner to determine if they are qualified to furnish the Goods and Special Services. All Bidders shall be prepared to submit within five days of Owner's or Engineer's request, additional written evidence of such information and data necessary to make this determination.
- 4.5 The investigation of a Bidder will seek to determine whether the organization is adequate in size, has had previous experience, owns licenses, or distributes the proposed technology, has process engineering, project management and mechanical engineering support in the United States, and whether available equipment and financial resources are adequate to assure Owner that the Goods and Special Services will be completed in accordance with the terms of the Agreement. The amount of other work to which the Bidder is committed may also be considered.
- 4.6 Owner reserves the right to reject any Bid if the evidence submitted by, or investigation of such Bidder fails to satisfy Owner that such Bidder is properly qualified to carry out the

obligations of the Contract and to furnish the Goods and Special Services contemplated therein.

- 4.7 In evaluating Bids, Owner will consider the qualifications of only those Bidders whose Bids are in compliance with the prescribed requirements.

ARTICLE 5 EXAMINATION OF BIDDING DOCUMENTS, OTHER RELATED DATA, AND POINT OF DESTINATION

- 5.1 Upon request and schedule permitting, the Owner will provide Bidder access to the Point of Destination and the site where Goods are to be installed or Special Services are to be provided so the Bidder may conduct such additional examinations, investigations, explorations, tests, and studies as Bidder deems necessary for preparing and submitting a successful Bid. Owner will not have any obligation to grant such access if doing so is not practical because of existing operations, security or safety concerns, or restraints on Owner's authority regarding the Site.
- 5.2 It is the responsibility of each Bidder before submitting a Bid to:
- A. examine and carefully study the Bidding Documents, including any Addenda, data, and referenced items identified in the Bidding Documents;
 - B. become familiar with the Owner's safety program (as the General Conditions indicate, if a Owner safety program exists, it will be noted in the Supplementary Conditions) that may govern work at the Site.
 - C. become familiar with and satisfy itself as to all Laws and Regulations that may affect cost, progress, or the furnishing of the Goods and Special Services;
 - D. carefully study, consider and correlate the information commonly known to sellers of similar goods doing business in the locality of the Point of Destination and the site where the Goods will be installed or where Special Services will be provided; information and observations obtained from Bidder's visits, if any, to the Point of Destination and the site where the Goods are to be installed or Special Services are to be provided; and any reports and drawings identified in the Bidding Documents regarding the Point of Destination and the site where the Goods will be installed or where Special Services will be provided, with respect to the effect of such information, observations, and documents on the cost, progress, and performance of Bidder's obligations under the Contract Documents;
 - E. agree, based on the information and observations referred to in the preceding paragraph, that at the time of submitting its Bid no further examinations, investigations, studies, or data are necessary for the determination of its Bid for providing Goods and Special Services at the price bid and within the times and in accordance with the other terms and conditions of the Bidding Documents; promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder;
 - F. determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for furnishing Good and Special Services and

- G. agree that the submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, that without exception the Bid and all prices in the Bid are premised upon furnishing Goods and Special Services required by the Bidding Documents.

ARTICLE 6 PRE-BID CONFERENCE

- 6.1 There will be no pre-Bid conference.
- 6.2 At a time acceptable to the Owner, Bidders may take water samples and conduct testing at the Vernon WPCF, 100 Windsorville Road, Vernon CT at their own expense. If performed, the Owner the following coordination requests:
 - A. Provide two days advance notice to Steve Boske at (860) 870-3545 or sboske@vernon-ct.gov.
 - B. Bidders can visit Mon – Fri between 7 am – 3 pm
 - C. Bidders must check in with Steve Boske in the Administration Building.
 - D. If requested in advance, the Owner can provide a small work area in their lab.
 - E. Bidders should plan to be off-site by 3 pm when the day shift ends.

ARTICLE 7 INTERPRETATIONS AND ADDENDA

- 7.1 All questions about the meaning or intent of the Bidding Documents shall be submitted in writing to the Engineer via the Tighe & Bond website for bidding document distribution at <http://www.tighebond.com/Projects Out to Bid.php>. Prospective bidders are responsible for ensuring their questions are received by the Engineer. Prospective bidders must be registered users of the website to submit questions regarding the project. In order to receive consideration, questions must be received by Engineer at least seven business days prior to the date fixed for the opening of Bids. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda to all parties recorded by Engineer as having received the Bidding Documents not later than five business days prior to the date fixed for the opening of Bids. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.
- 7.2 Addenda may be issued to clarify, correct, supplement or change the Bidding Documents. Such Addenda, if any, will be issued in the manner and within the time period stated in paragraph 7.1. Note that addenda issued during the bidding period will be submitted for review and approval of DEEP prior to bid opening.
- 7.3 The Bidder must acknowledge receipt of each Addenda, if any, in the space provided on the Bid Form.

ARTICLE 8 BID DEPOSIT

- 8.1 In the Bidding Documents, the terms “Bid security” and “Bid deposit” shall have the same meaning.
- 8.2 Bids must be accompanied by a Bid deposit in the amount of 5% of the Bidder’s maximum Bid price and in the form of a bid bond payable to the Owner. The bidders maximum bid

price shall be calculated as the total Capital Cost portion of the Bid Form. The Bid Bond must be issued by a surety company licensed in the State of Connecticut.

- 8.3 The Bid deposit of the Successful Bidder will be retained until the Owner has signed an Agreement with the Construction Contractor, and the Successful Bidder has provided the performance bond as required, whereupon the Bid deposit will be returned.
- 8.4 Bid deposit of other Bidders will be returned within seven days after written notification from the Owner that it has not been selected as the successful Bidder.

ARTICLE 9 CONTRACT TIMES

- 9.1 See applicable provisions in the Agreement.

ARTICLE 10 LIQUIDATED DAMAGES

- 10.1 Provisions for liquidated damages, if any, such as those for Bidder's failure to attain a Milestone, to deliver the Goods or furnish Special Services within the Contract Times are set forth in the Agreement.

ARTICLE 11 SUBSTITUTE AND "OR EQUAL" ITEMS

- 11.1 The Contract, if awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration during the bidding and Contract award process of possible substitute or "or equal" items. In cases in which the Contract allows the Seller to request that Engineer authorize the use of a substitute or "or equal" item of material or equipment, application for such acceptance may not be made to and will not be considered by Engineer until after the effective date of the Contract.

ARTICLE 12 PREPARATION OF BID

- 12.1 A Bid must be made on the Bid form included with the Bidding Documents. The Bid form shall not be altered in any way.
- 12.2 The Bid form must be completed in ink. Blank spaces in the Bid form must be filled in correctly where indicated, and the Bidder must state, both in words and numerals, the prices for which he proposes to complete each and every item of Work. Ditto marks shall not be used. A Bid price shall be indicated for each item listed therein. In the case of optional alternates the words "No Bid," "No Change," or "Not Applicable" may be entered.
- 12.3 A Bidder shall execute his Bid as stated below.
 - A. A Bid by an individual shall show the Bidder's name and official address.
 - B. A Bid by a partnership must be executed in the partnership name and signed by a partner (whose title must appear under the signature) accompanied by evidence of authority to sign. The official address of the partnership shall be shown.
 - C. A Bid by a corporation must be executed in the corporate name by a corporate officer (whose title must appear under the signature) and must be accompanied by evidence of authority to sign. The corporate seal shall be affixed and attested by the corporate secretary. The state of incorporation and the official corporate address shall be shown.

- D. A Bid by a limited liability company shall be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm shall be shown.
 - E. A Bid by a joint venture shall be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture shall be shown.
 - F. All names must be printed in ink below the signature.
- 12.4 The Bid shall contain an acknowledgment of the receipt of all Addenda in the space provided on the Bid form.
- 12.5 Postal and email addresses and telephone number to which communications regarding the Bid are to be directed shall be shown.
- 12.6 In order to be considered for selection, the Bidder must submit a complete bid package in accordance with these Bidding Documents. Partial Bids will not be accepted. Refer to the Bid Form for a list of documents that shall be submitted in addition to the Bid Form.
- 12.7 Any deviations in completion of the Bid Form and accompanying documents from the instructions provided in this Article may be cause for rejection of the Bid.

ARTICLE 13 BASIS OF BID

13.1 General

- A. Bidders shall submit a Bid as set forth in the Bid form.
 - B. The Owner will evaluate and accept a Bid which, in the Owner's sole and absolute judgment, will best serve the interest of the Owner. All Bids, not rejected, will be evaluated, in part, based on a present-worth cost basis using information provided by Bidders in the Bid Form, and installation costs estimated by the Engineer. Annual operation and maintenance costs included in the present worth analysis will be based on the flow scenarios defined in the bid form. Equipment and system sizing shall be as specified in Division 11 and included in the life cycle analysis.
- 13.2 The evaluation will be scored according to the following two categories and awarded to the Bidder with the highest overall score while meeting all requirements of the specifications:

Criteria	Total Available Score
A. Total Present Worth Cost of Installed System	70
B. Non-Monetary Criteria	30
Total Score	100

- 13.3 All Bids, not rejected, will be evaluated in part on the basis of lowest present-worth cost of the installed system, which consists of a maximum of 70 points. The cost evaluation will be based on the following:
- A. Capital costs of the Bidder's equipment, including proposed equipment, spare parts, and Special Services. Special Services includes all other Bidder's services required by the Bidding Documents, including but not limited to: assisting the Engineer throughout the design and providing shop drawing level drawings, P&IDs, specifications and any other design assistance that may be requested, service

agreements (if any), the process guarantee, system checkout, startup assistance, documentation, performance testing, and operator training.

- B. Construction costs as estimated by the Engineer, including installation of the proposed equipment. This includes:
1. cost of new concrete channels, piping, tanks, baffles, and basins needed to install the equipment;
 2. Cost of modifying existing tanks and/or structures to accommodate the equipment
 3. cost of excavation for new tanks, basins, piping, equipment rooms, if any;
 4. cost of required flow control and tank/channel drainage or isolation gates not supplied by the bidder;
 5. cost of furnishing and installing electrical, instrumentation and control equipment;
 6. cost of furnishing and installing any necessary building/structures/canopies to house or cover the proposed systems. This includes electrical and control systems, chemical storage areas, spare equipment storage areas, and other equipment including pumping, and hoisting related to the proposed system (as required). At the Engineer's option, the costs common to all Bidders may be excluded from the analysis.
 7. Cost of furnishing additional equipment, outside of the Bidder's scope of supply as described herein, necessary for the Bidder to guarantee successful operation of the system. This includes equipment such as chemical feed and storage equipment, mixing equipment, and pumping equipment. At the Engineer's option, the costs common to all Bidders may be excluded from the analysis.
- C. The present-worth of the operation and maintenance costs will be calculated over 20 years at a specified discount rate, power cost, and labor rate for system maintenance and replacement of parts. These costs will be based on the various operating conditions and weighting as described in the Bid Form (Section 00410).
1. Operation and maintenance costs include, but are not limited to: energy consumption, chemical use, and labor and materials for operations and maintenance, and other pertinent costs associated with operating the proposed equipment to meet the required performance standards for the equipment.
 2. Labor for operations and maintenance will be estimated based on the quantity and type of the proposed equipment and vendor specific instrumentation, based on Engineer's pre-determined estimates of labor effort associated with typical operating and maintenance tasks associated with each item.
 3. Operation and maintenance costs associated with sludge disposal.
 4. Operation and maintenance costs associated operating and maintaining necessary ancillary buildings and enclosures to account for heating, lighting, and ventilation.

- D. The total present-worth cost evaluation will consist of a maximum score of 70 points. The Bid with the lowest present-worth cost will score the maximum 70 points. Each Bid that has a present-worth cost that exceeds the lowest present-worth bid will score a percentage of the maximum points. The percentage will be calculated as the present-worth value of the lowest present-worth bid divided by the present-worth value of that bid.

- 13.4 All Bids, not rejected, will be evaluated, in part, on the basis of the Bidder's qualifications, United States experience, and other non-monetary criteria provided by the Bidder with their Bid and consists of a maximum of 30 points.

- A. The evaluation will be based on the following:

Non-Monetary Criteria	Total Available Score
1. Bidder has a minimum of 5 US municipal wastewater installations of the proposed UV disinfection system successfully operating for 3 years or more, designed for a peak flow of 15 mgd or greater.	0 or 10
2. Number of US municipal wastewater installations of the proposed model of UV disinfection system that follow a tertiary phosphorus removal process successfully operating for at least 3 years, designed for a peak flow of 10 mgd or greater. One point will be assigned for each such installation up to the total available score.	6
3. Bidder has local factory certified service provider either within a 100 mile drive or within a 3 hour drive of the Vernon facility.	0 or 2
4. Ease of maintenance (Owner's sole interpretation of the system's maintenance requirements; ease of lamp replacement, equipment access, etc.)	6
5. Ease of operability (Owner's sole interpretation of the system's operational scheme and reliability including but not limited to, the manufacturer's control logic, level of effort required to adjust and optimize the systems operation)	6
Total Score	30

Notes: If the total available score indicate "0 or X", then the Bidder will receive "X" points if they meet the criteria or "0" points if they do not. Unless otherwise noted, if the total score available indicates "Y", the maximum score for each category ("Y") will be assigned to the BIDDER with the highest ranking within each category. The score of other bids will be reduced from the maximum score within each criteria category proportionally.

- 13.5 Bidder must submit their anticipated schedule for delivery of deliverables as specified in Article 5 of the Bid Form, Section 00410. The Owner reserves the right to consider the Bid non-responsive if the Bidder's anticipated schedule for any deliverable exceeds the maximum specified in the bid form.
- 13.6 In order for the Owner to assess the Bidder's experience and qualifications for the purposes of the evaluation process, each Bidder shall provide the information in Article 5 of the Bid Form with their bid.

ARTICLE 14 SUBMITTAL OF BID

- 14.1 A Bid shall be received no later than the date and time prescribed and at the place indicated in the advertisement for Bids and shall be enclosed in an opaque sealed envelope plainly marked with the Project title, the name and address of Bidder, and shall be accompanied by the Bid deposit and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate envelope plainly marked on the outside with the notation "BID ENCLOSED". When using the mail or other delivery system, the Bidder is totally responsible for the mail or other delivery system delivering the Bid at the place and prior to the time indicated in the Advertisement for Bids. A mailed Bid shall be addressed to Owner at the address in the Advertisement for Bids.
- 14.2 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened.

ARTICLE 15 MODIFICATION OR WITHDRAWAL OF BID**15.1 Withdrawal Prior to Bid Opening**

- A. A Bid may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.

15.2 Modification Prior to Bid Opening

- A. If a Bidder wishes to modify its Bid prior to the Bid opening, Bidder must withdraw its initial Bid in the manner specified in paragraph 15.1.A and submit a new Bid prior to the date and time for the opening of Bids.

ARTICLE 16 OPENING OF BIDS

- 16.1 Bids will be opened as indicated in the Advertisement for Bids and, unless obviously unresponsive, bid prices will be publicly read aloud. An abstract of the amounts of the bid prices will be made available to Bidders after the opening of Bids.
- 16.2 In order to be considered for selection, Bids must arrive at the designated location on or before the date and time specified in the Advertisement for Bids. Bidders mailing their Bids should allow for normal mail delivery time to ensure timely receipt of their Bids by Owner.
- 16.3 Bids received after the time specified for the opening of Bids will not be accepted and will be returned to the Bidder unopened.
- 16.4 No responsibility will be attached to Owner, its employees or the Engineer for premature opening of a Bid not properly addressed and identified in accordance with the Bidding Documents.

ARTICLE 17 BIDS TO REMAIN SUBJECT TO ACCEPTANCE

- 17.1 All Bids will remain subject to acceptance for the period of time stated in the Bid form, but Owner may, in its sole discretion, release any Bid and return the Bid deposit prior to the end of this period.

ARTICLE 18 EVALUATION OF BIDS AND AWARD OF CONTRACT

- 18.1 Owner reserves the right to reject any and all Bids, to waive any and all informalities, and the right to disregard all nonconforming, nonresponsive or conditional Bids.
- 18.2 Owner reserves the right to reject any Bid not accompanied by specified documentation and Bid deposit.
- 18.3 Owner reserves the right to reject any Bid if it shows any omissions, alterations of form, additions not called for, conditions or qualifications, or irregularities of any kind.
- 18.4 Owner reserves the right to reject any Bid that, in his sole discretion, is considered to be unbalanced or unreasonable as to the amount bid for any lump sum or unit price item.
- 18.5 More than one Bid for the same Goods and Special Services from an individual, or a firm, partnership, corporation or an association under the same or different names will not be considered. Reasonable grounds for believing that any Bidder is interested in more than one Bid for the Goods and Special Services shall be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder is interested.
- 18.6 In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices and other data, as may be requested in the Bid Form or prior to the Notice of Award.
- 18.7 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, performance record, ability to perform the size and type of work specified or to resolve other issues, and financial ability of Bidders as determined by an evaluated selection process described in Article 13.
- 18.8 To be considered a responsive Bidder, the Bidder shall be a registered plan holder on Tighe & Bond's bid portal and have downloaded the Bidding Documents. The Bid will not be awarded to a Bidder unless a record of download of the Bidding Documents exists in Tighe & Bond's bid portal. To meet this requirement a prospective Bidder must register using the name that is to appear in the Bid Documents.
- 18.9 If the Owner awards the Contract for the Goods and Special Services, such award shall be to the responsible Bidder (who has neither been disqualified nor rejected pursuant to this Article 18) whose Bid is in the best interest of the Project.
- 18.10 Contents of the Bid of the Successful Bidder will become part of any contract awarded.
- 18.11 Refer to Article 6 of the Agreement for provisions related to price adjustment.
- 18.12 Bidder shall hold his operation and maintenance guaranteed values bid for items in Paragraph 5.3.B of the Bid Form, until performance testing of the system is successfully completed as specified in Division 11 of the Contract Documents.
- 18.13 Owner reserves the right to request that Bidders attend a formal interview to review and further clarify the Bidder's response for the purpose of evaluating the Bid. The interview will be held in the Owner's Water Pollution Control Facility at a time and place to be determined after Bids have been received and opened. Owner also reserves the right to waive any formal interview process.

ARTICLE 19 CONTRACT SECURITIES AND INSURANCE

- 19.1 Bidders shall submit with their bid a letter from their surety indicating that the Bidder currently qualifies for the performance bond as required above. Surety shall be licensed to transact such business in the State of Connecticut and named on the current list of “Surety Companies Acceptable on Federal Bonds” as published in the “Treasury Department Circular 570”. Notice of Award of the Contract and Execution of an agreement between the Owner and the Seller shall be contingent on receipt of this letter.

ARTICLE 20 SIGNING OF AGREEMENT

- 20.1 The Owner will transmit the required number of unsigned Agreements to the Successful Bidder with the notice of pre-selection. Within 15 days of the date of the notice of pre-selection, the Successful Bidder shall sign the Agreements and return them to the Owner. The Owner will return one executed Contract to the Successful Bidder.

ARTICLE 21 SALES TAXES

- 21.1 Owner is exempt from Connecticut State sales and use taxes on materials and equipment to be incorporated in the Project. Said taxes shall not be included in the Bid. Refer to Paragraph 5.05 of the Supplementary Conditions for additional information.

ARTICLE 22 EPA PROJECT REQUIREMENTS FOR SRF-FUNDED PROJECTS

- 22.1 This Project is subject to the American Iron and Steel (AIS) requirement of Section 436 of Public Law (P.L.) 113-76, Consolidated Appropriations Act, 2014, which requires that all of the iron and steel products used in the project are produced in the United States. Section 00800 contains further information on applicable iron and steel products and compliance.

END OF SECTION

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To Recipient: Please complete the signatory information, sign, date and return this agreement to Tighe & Bond, Inc. by email to pamoran@tighebond.com.

AGREEMENT FOR DELIVERY OF DOCUMENTS IN ELECTRONIC FORM

In connection with the **Town of Vernon CT WPCF Upgrade UV Disinfection System Equipment Pre-Selection** (hereinafter "Project") for which Tighe & Bond, Inc. ("Engineer") has been retained to provide services, _____ (hereinafter "Recipient") has requested that Engineer provide Recipient with certain Instruments of Services prepared by Engineer and its subconsultants in electronic machine readable format. These documents in such format, and as expressly listed herein, shall hereinafter be referred to as the "Electronic Documents".

In consideration of the Engineer's agreement to release Electronic Documents, the Recipient agrees as follows:

1. It is understood and agreed that all drawings, specifications or other documents of any kind prepared by Engineer or its subconsultants, whether in hard copy or any electronic or machine readable format, including Electronic Documents (collectively the "Engineer's Documents"), are, and shall remain, instruments of their services. These Instruments of Services were prepared solely for use in connection with this Project. Engineer and its subconsultants retain all common law, statutory and other reserved rights, including the copyright. This Agreement is not intended in any way to alter the respective interests of the parties in the Instruments of Service as set forth in any agreement for services between Recipient and Engineer, notwithstanding Engineer's agreement to release the Electronic Documents to Recipient.

2. The Electronic Documents are provided as a convenience to the Recipient for informational purposes only in connection with the Recipient's performance of its responsibilities and obligations relating to the Project. The Electronic Documents do not replace or supplement the paper copies of the Drawings and Specifications which are, and remain, the Contract Documents for the Project or the paper copies of any other document prepared by the Engineer or its subconsultants.

3. The parties agree that the Electronic Documents are not, nor shall they be construed to be, a product. It is expressly agreed by the Recipient that there are no warranties of any kind in such Electronic Documents or in the media in which they are contained, either express or implied.

4. It is further understood and agreed that no Electronic Documents shall be signed or sealed.

5. If any differences exist between printed Instruments of Service and the Electronic Documents, the information contained in the printed documents shall be presumed to be correct and take precedence over the Electronic Documents.

6. Recipient agrees not to add to, modify or alter in any way, or to allow others to add to, modify or alter in any way, the Electronic Documents, except as expressly described herein.

7. The Electronic Documents are supplied in the following format: **AutoCAD (.dwg)**.

It is understood by Recipient that the media in which any Electronic Documents are transmitted can deteriorate over time and under various conditions. Engineer is not responsible for such deterioration. In addition, any conversion of the format is solely the responsibility of the Recipient. Recipient understands and agrees that the conversion of paper copies of Instruments of Service into electronic or machine readable format or the conversion of Electronic Documents from the machine readable format used by Engineer to some other format may introduce errors or other inaccuracies. Recipient therefore agrees to confirm the accuracy of the Electronic Documents before using them. Recipient

agrees to accept all responsibility for any errors or inaccuracies and to release Engineer and its subconsultants from any liability or claims for recovery of damages or expenses arising as the result of such errors or inaccuracies.

8. Where the Recipient has received specific permission to use the Electronic Documents in connection with Recipient's obligation to prepare certain documents for Project, Recipient shall, in addition to the other obligations set forth herein, be obligated to remove Engineer's or Engineer's subconsultant's title block from the copy of the Electronic Documents used by Recipient.

9. Recipient further agrees that the Engineer's Documents were prepared for use in connection with this Project only and that the Electronic Documents are supplied to Recipient for the limited purpose stated herein only. Recipient agrees not to use, or allow others to use, the Electronic Documents, in whole or in part, for any purpose or project other than as stated herein without the express prior written permission of the Engineer.

10. Recipient agrees to waive any and all claims and liability against Engineer and its subconsultants resulting in any way from any failure by Recipient to comply with the requirements of this Agreement for the Delivery of Documents in Electronic Format.

11. Recipient further agrees to indemnify and save harmless the Engineer and its subconsultants and each of their partners, officers, shareholders, directors and employees from any and all claims, judgments, suits, liabilities, damages costs or expenses (including reasonable defense and attorneys fees) arising as the result of either: 1) Recipient's failure to comply with any of the requirements of this Agreement for the Delivery of Documents in Electronic Format; or 2) a defect, error or omission in the Electronic Documents or the information contained therein, which defect, error or omission was not contained in the Contract Documents as defined in Paragraph 2 or where the use of such Contract Documents would have prevented the claim, judgment, suit, liability, damage, cost or expense.

RECIPIENT

_____ **Date:** _____

Name: _____

Title: _____

Company: _____

Identification of Electronic Documents covered by this Agreement:

Figure 5 – UV System Plan
Figure 6 – UV System Sections

Approved use of Electronic Documents covered by this Agreement:

Preparation of general arrangement drawings for inclusion in Recipient's bid showing
Recipient's proposed equipment within the Town of Vernon's existing structures.

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SECTION 00410

BID FORM

SECTION 00410

FORM FOR BID

PROJECT IDENTIFICATION:

Vernon CT Water Pollution Control Facility Upgrade Project
UV Disinfection System Equipment Preselection

TABLE OF ARTICLES

1. Bid Recipient
2. Bidder's Acknowledgements
3. Bidder's Representations
4. Bidder's Certifications
5. Basis of Bid
6. Time of Completion
7. Attachments to This Bid
8. Bid Submittal

ARTICLE 1 - BID RECIPIENT

- 1.1 This Bid is submitted to:

Town of Vernon Office of the Town Administrator
14 Park Place
Vernon, CT 06066

- 1.2 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents. This agreement will stipulate that the Bidder's Goods and Special Services as specified or indicated in the Bidding Documents will be furnished at the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents and the upcoming upgrade project.

ARTICLE 2 - BIDDER'S ACKNOWLEDGEMENTS

- 2.1 Bidder accepts all of the terms and conditions of the Advertisement for Bids and Instructions to Bidders, including without limitation, those dealing with the disposition of Bid deposit. The Bid will remain subject to acceptance until October 1, 2019, or for such longer period of time that Bidder may agree to in writing upon request of Buyer.

ARTICLE 3 - BIDDER'S REPRESENTATIONS

- 3.1 In submitting this Bid, Bidder represents, as set forth in the Agreement, that:

- A. Bidder has examined and carefully studied the Bidding Documents, and any data and reference items identified in the Bidding Documents and hereby acknowledges the receipt of all Addenda.

- B. Bidder has visited the Point of Destination and site where the Goods are to be installed or Special Services will be provided and become familiar with and satisfied as to the observable local conditions that may affect cost, progress, and furnishing of Goods and Special Services, if required to do so by the Bidding Documents, or if, in Bidder's judgement, any local condition may affect cost, progress, or the furnishing of Goods and Special Services.
- C. Bidder is familiar with and has satisfied itself as to all federal, state and local Laws and Regulations that may affect cost, progress and furnishing of Goods and Special Services.
- D. Bidder has carefully studied, considered, and correlated the information known to Bidder; information commonly known to sellers of similar goods doing business in the locality of the Point of Destination and the site where the Goods will be installed or where Special Services will be provided; information and observations obtained from Bidder's visits, if any, to the Point of Destination and the site where the Goods will be installed or Special Services will be provided; and any reports and drawings identified in the Bidding Documents regarding the Point of Destination and the site where the Goods will be installed or where Special Services will be provided, with respect to the effect of such information, observations, and documents on the cost, progress, and performance of Seller's obligations under the Bidding Documents.
- E. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Goods and Special Services that are to be furnished as indicated in the Bidding Documents.
- F. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and confirms that the written resolution thereof by Engineer is acceptable to Bidder.
- G. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for furnishing the Goods and Special Services for which this Bid is submitted.
- H. The submission of this Bid constitutes an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, and that without exception the Bid and all prices in the Bid are premised upon furnishing the Goods and Special Services required by the Bidding Documents.

ARTICLE 4 - BIDDER'S CERTIFICATION

- 4.1 Bidder certifies that this Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation.
- 4.2 Bidder certifies that Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid.
- 4.3 Bidder certifies that Bidder has not solicited or induced any individual or entity to refrain from bidding.
- 4.4 Bidder certifies that Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph:

- A. “corrupt practice” means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process;
- B. “fraudulent practice” means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of the Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
- C. “collusive practice” means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and
- D. “coercive practice” means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process.

ARTICLE 5 - BASIS OF BID

5.1 Bidder proposes to furnish all Goods and Special Services required for construction of the UV Disinfection System for the Vernon CT WPCF Phosphorus Upgrade Project in accordance with the accompanying Bidding Documents prepared by Tighe & Bond, Inc., for the Contract Prices specified in Article 5 Paragraph 5.3A at the guaranteed operation and maintenance values and costs specified in Article 5 Paragraph 5.3B, with additional supporting equipment information, documentation and bidder qualifications as described in Article 5 Paragraphs 5.4, 5.5, and 5.6, all according to the terms of the Bidding Documents.

5.2 This Bid includes Addenda numbered _____

5.3 The proposed Contract Prices and Guaranteed Operation and Maintenance Costs are provided in Paragraphs 5.3.A and 5.3.B below:

A. CAPITAL COST

Item No.	Unit of Measure	Description	Total Price Dollar Figures
			Total Price Written Words
1	L.S.	Supply the UV Disinfection System as specified herein including all ancillary equipment, spare parts, tools, and Special Services not included in Items 2 and 3 below.	\$
2	L.S.	Extended Warrantee for Lamps and Ballasts – The added cost to meet the warrantee requirements specified in Section 11262, Paragraph 1.7 if beyond the manufacturer’s standard warrantee.	\$
3	L.S.	Seller’s Service Agreement – Two-year service agreement as specified in Section 11262, Paragraph 1.11.	\$
TOTAL UV DISINFECTION SYSTEM BID PRICE CAPITAL COST Sum of Items 1, 2 and 3 Above			\$

B. OPERATION AND MAINTENANCE GUARANTEE

1. General Items: In filling out the tables below, the guaranteed power and energy usage numbers shall be on the validated lamp aging and fouling factors (not an average) and the maximum factors applied shall not exceed those noted in specification section 11262 (0.80 for lamp life factor, 0.90 for quartz transmission factor and 0.90 for quartz fouling factor). The total system power demand shall not take into account the active operation of in channel cleaning equipment. Energy consumption for cleaning shall be accounted for separately.

Item Number	Item Name / Description	Units	Value/Cost
1.	Total UV Disinfection System Power Demand at 1.0 MGD & UV Transmittance at 253.7 nm setting of 65 % (including all required Power Distribution Center related power – with two UV channels online)	(KW)	
2.	Total UV Disinfection System Power Demand at 2.0 MGD & UV Transmittance at 253.7 nm setting of 65 % (including all required Power Distribution Center related power) – with two UV channels online	(KW)	
3.	Total UV Disinfection System Power Demand at Current Average Flow (2.95 MGD) & UV Transmittance at 253.7 nm setting of 65% (including all required Power Distribution Center related power) – with two UV channels online	(KW)	
4.	Total UV Disinfection System Power Demand at 4.0 MGD & UV Transmittance at 253.7 nm setting of 65 % (including all required Power Distribution Center related power) – with two UV channels online	(KW)	
5.	Total UV Disinfection System Power Demand at Design Average Flow (4.8 MGD) & UV Transmittance at 253.7 nm setting of 65% (including all required Power Distribution Center related power) – with two UV channels online	(KW)	
6.	Total UV Disinfection System Power Demand at 6.0 MGD & UV Transmittance at 253.7 nm setting of 65 % (including all required Power Distribution Center related power) – with two UV channels online	(KW)	

7.	Maximum Total UV Disinfection System Power Demand (All Lamps On and Operating at 100% Power) including redundant units (including all required Power Distribution Center related power) – with two UV channels online	(KW)	<hr/>
8.	Total UV Disinfection System Power Demand without ANY lamps on (including power related to routine cleaning of both UV channels, Power Distribution Centers, and the System Control Center).	(KW)	<hr/>
9a.	Is In-channel air scour required?	(Yes/No)	<hr/>
9b.	In-channel air scour (cost) (If not required the costs will not be incorporated in the evaluation; however, the Seller shall guarantee this cost as an adder price if the Buyer elects to incorporate this option into the project.)	(\$)	<hr/>
10.	Warrantied lamp operating life (non-prorated) (maximum 4 cycles of on/off per day on average)	(Hours)	<hr/>
11.	Warrantied lamp operating life (non-prorated) (greater than 4 cycles on/off per day on average)	(Hours)	<hr/>
12.	Warrantied ballast life (non-prorated)	(Years)	<hr/>
13.	Warrantied wiper seal/sleeve wiper life (non-prorated)	(Years)	<hr/>
14.	Warrantied quartz sleeve life (non-prorated)	(Years)	<hr/>
15.	Warrantied UV intensity sensor life (non-prorated)	(Years)	<hr/>
16.	Warrantied UV transmittance monitor (sensor and analyzer unit) life (non-prorated)	(Years)	<hr/>
17.	In-channel air scour blower life (if required)	(Years)	<hr/>
18.	Average operator time to replace a lamp	(Minutes)	<hr/>
19.	Average operator time to replace a ballast	(Minutes)	<hr/>
20.	Average operator time to replace a wiper seal/sleeve wiper	(Minutes)	<hr/>
21.	Average operator time to replace a quartz sleeve	(Minutes)	<hr/>
22.	Lamp Replacement Cost (10 year Guaranteed Price)	(\$ per lamp)	<hr/>
23.	Replacement ballast (10 year Guaranteed Price)	(\$ per ballast)	<hr/>
24.	Replacement wiper (10 year Guaranteed Price)	(\$ per wiper)	<hr/>

- | | | | |
|-----|---|-----------------|-------|
| 25. | Replacement quartz sleeve (10 year Guaranteed Price) | (\$ per sleeve) | _____ |
| 26. | Replacement UV Intensity Sensor (10 year Guaranteed Price) | (\$ per unit) | _____ |
| 27. | Replacement in-channel air scour blower (if required) (10 year Guaranteed Price) | (\$ per unit) | _____ |
| 28. | Manufacturer shall designate their intended method for cleaning and fill out the associated section below. | | |
| | Chemical Usage/ In-Service (In Channel Chemical Cleaning) | | _____ |
| | Out-of-Service (Out-of-Channel) Chemical Cleaning | | _____ |

28a. General Cleaning

- | | | | |
|--------|--------------------------------------|---------------------|-------|
| 28a.1. | Required chemical cleaning solution | (type) | _____ |
| 28a.2. | Chemical cleaning solution cost | (\$ per gallon) | _____ |
| 28a.3. | Cleaning Cycles per day | (Cycles/Module/Day) | _____ |
| 28a.4. | Power Consumption per cleaning cycle | (kWH/cycle/module) | _____ |

28b. In Channel Chemical Cleaning

- | | | | |
|--------|--|------------------------|-------|
| 28b.1. | Operator time required to maintain the chemical cleaning equipment (chemical fills, etc.) | (minutes/module) | _____ |
| 28b.2. | Chemical usage at average design conditions (disinfection period May 1 – September 30) | (gallons/module/month) | _____ |
| 28b.3. | Chemical usage at average design conditions (no-disinfection period October 1 – April 30). Assume modules are left in the channel with flow but no UV. | (gallons/module/month) | _____ |

28c. Out-of-Service (Out-of-Channel) Chemical Cleaning

- | | | | |
|--------|----------------|-------------------------|-------|
| 28c.1. | Chemical usage | (gallon/module cleaned) | _____ |
|--------|----------------|-------------------------|-------|

- | | | | |
|--------|--|-------------------------|--|
| 28c.2. | Required rate of module chemical cleaning at average design conditions (each module shall be cleaned at least once annually) | (modules/month) | |
| 28c.3. | Operator time required to chemically clean a module | (minutes/module) | |
| 28c.4. | Power required for air scour | (KWH/module cleaned) | |
| 29. | Annual Maintenance Labor Requirement | (Man Hours/Module/year) | |
| 30. | Annual Maintenance Equipment Cost | (\$/module/year) | |

Include the cost (and provide with the bid a list) of replacement equipment and consumables for which unit costs are not listed in the bid form. This shall include, but not be limited to, other chemicals or substances, compressed air, components requiring routine replacement, or other components of the equipment with a useful life of less than 20 years. Include annualized unit costs based on past experience. Note that this does not obligate the Buyer to purchase these items through the Seller.

- C. The Bidder acknowledges that this bid will be evaluated using the Guaranteed Operational and Maintenance Values and Costs included in Paragraph 5.3B in the following manner:
- a. The annual operating costs will be based on 152 days of operation (May 1 – September 30) assuming a UVT of 65% and the following weights based on operating conditions assigned to the guaranteed costs/values:

Flow (MGD)	Weighting
1.0	10%
2.0	15%
2.95	30%
4.0	25%
4.8	15%
22	5%

- D. The Bidder acknowledges the Guaranteed Operational and Maintenance Values and Costs included in Paragraph 5.3B must be guaranteed for the time periods described in Article 18 of the Instructions for Bidders (Section 00200).
- 5.4 A summary of the proposed equipment, a detailed breakdown of the operational and maintenance values used to back up the values in Paragraph 5.3.B, and delivery schedule to be provided is as follows:
- A. General Equipment

	Proposed
1. Number of banks	
2. Number of modules	
3. Number of lamps	
4. Number of ballasts	
5. Number of sleeves and wipers	
6. Number of UV intensity sensors	
7. Number of power distribution centers	
8. Number of system control centers	
9. Post Aeration Tank weir length required (feet; greater than 29' requires Seller to provide replacement Post Aeration Tank weir)	

B. Operating Conditions at Specified Scenarios

	Proposed
1. Number of banks on-line per channel at peak flow rate & UV Transmittance at 253.7 nm setting of 65%	
2. Minimum number of lamps on-line per channel at peak flow rate & UV Transmittance at 253.7 nm setting of 65%	
3. Method of lamp output variation (dim, on/off, etc.)	
4. Level control method via flow control weir (type)	

C. Hydraulics

	Proposed
1. Head loss from upstream of the first module of lamps to downstream of the last module of lamps prior to the post aeration tank training wall at design average flow (inches, refer to maximum allowable value shown on Figure 4 in Appendix A)	
2. Head loss from upstream of the first module of lamps to just downstream of the last module of lamps prior to the post aeration tank training wall at peak hour flow with both UV channels in service (inches)	
3. Minimum water depth within the UV channel with UV equipment operating (inches)	

4. Recommended UV effluent weir elevation. Refer to Paragraphs 1.3.F and 2.7 of Section 11262 for existing conditions and design constraints.
5. Recommended UV channel invert elevation based on recommended UV effluent weir elevation.
6. Number of additional 12" diameter baffle holes in post aeration tank training wall required (each, per aeration tank)
7. What is the lowest flow that each UV channel can handle before non-uniform flow through the channel becomes a design factor. If this flow is greater than the specified typical daily low flow rate divided by two channels, then attach a detailed explanation on how the design factor will be addressed to guarantee performance.

D. Delivery Schedule

	Duration
1. Preliminary Shop Drawings (weeks from Owner's request, maximum of 8)	
2. Shop Drawings (weeks from execution of purchase order with the Buyer, maximum of 10)	
3. Delivery of Goods (weeks from Shop Drawing Approval, maximum of 22)	

5.5 The following supplementary information is provided with the Bid:

- A. Written description and Seller's literature of the proposed system.
- B. Dimensioned plans and sections of the proposed system process equipment including locations of modules, banks, lamps, hoists, cleaning equipment, spare equipment and out of service equipment storage, field instruments, power distribution centers, controls and control panels, major power cable chases, and all other major system components.
- C. Dimensioned plans and sections of the proposed system layout including required number of channels, channel/tank widths, lengths, depths, relative water surface elevations, and minimum relative elevations of all equipment to be supplied.
- D. Using the AutoCAD .dwg files that were made available by the Engineer as described in Section 00200, Article 3, submit proposed arrangement drawings showing Seller's equipment within the Owner's existing structures as they are illustrated on Figures 5 and 6 included in Appendix A. These layouts shall include dimensions, elevations, and locations of all proposed equipment including UV modules, level control weirs, cleaning equipment, System Control Center, Power Distribution Centers, and lifting equipment. Layouts shall also include channel dimensions and demonstrate compliance with all dimensional limitations in Appendix A.

- E. Written description of any specific equipment requirements such as the need for equipment to be protected from weather and the elements.
- F. Written description of proposed method for compliance of redundancy requirements.
- G. Details of any special equipment required.
- H. Details of operation of the system (labor requirements to operate and maintain equipment) including weekly and monthly maintenance schedule. Include a listing and the cost of replacement equipment and consumables for which unit costs are not listed in the bid form. This shall include, but not be limited to, other chemicals or substances, compressed air, components requiring routine replacement, or other components of the equipment with a useful life of less than 20 years.
- I. Details of power distribution cabinets and control systems (control panel layouts and wiring schematics).
- J. Details demonstrating the ability of the proposed system to hydraulically pass the range of flows as required to meet the average day and peak hour flow rates. Include confirmation that the system complies with paragraphs 1.3.F and 2.7 of Section 11262.
- K. Written description of any requirements for flow splitting methodology between UV channels.
- L. Third party validation test reports for lamp design factors used in the Seller's design calculations.
- M. Bioassay test report prepared by a certified laboratory independent of the manufacturer. The bioassay completed, shall be on the proposed system lamps to verify the anticipated performance. The bioassay shall show the UV dose produced by the system as a function of flow per lamp. Clearly note the MS-2 sensitivity used and reference the page and paragraph location of the test data) in the bioassay test report. Sizing calculations based on validation data must show compliance with the specification. The manufacturer's bioassay validation methodology as carried out by an independent third party, shall follow protocols described in the U.S. EPA Design Manual - Municipal Wastewater Disinfection (EPA/625/1-86/021) and be in accordance with NWRI Ultraviolet Disinfection Guidelines for Drinking Water and Water Reuse (May 2003).
- N. Guarantee of parts availability from the Seller for 20 years after purchase. Should replacement parts not be available from the Seller, said Seller must replace all parts needed to bring the device to a working condition or replace the entire UV disinfection system with a complete system of equal performance.
- O. A statement declaring that the UV Disinfection System can be started up, operated, and performance tested as specified during the following stated conditions:
 - 1. While the Zimpro PACT-WAR system is still in operation and the incoming TSS includes residual powdered activated carbon
 - 2. After the existing sand filters have been demolished, and
 - 3. Before the Cloth Media Filtration System is operational

5.6 The Seller represents to the Owner the following as evidence of Seller's qualifications (evaluated as described in Section 00200) to supply the equipment and provide services specified herein:

- A. Number of years Seller has been in business under the name in which these Goods and Special Services will be furnished.
- B. Provide a list of open channel UV installations of the proposed model of the UV disinfection system in municipal effluent in the United States at municipal wastewater treatment facilities. Note that the listed projects must be of the same type and service application as proposed for this project. Include the following items as part of the list:
 - 1. Name of wastewater treatment facility
 - 2. Name, Address, and telephone number of Buyer, with a contact person who can address the performance and maintenance of the proposed equipment
 - 3. Design flow rates including average annual maximum month, maximum day, and peak)
 - 4. Date system was installed and placed in operation
 - 5. Number of lamps, banks, and channels in the system
 - 6. Lamp Type
 - 7. Method of level control
 - 8. Indicate if the system follows a tertiary phosphorus removal system
- C. Provide proof and the address of the closest factory certified service center to the Vernon facility.

ARTICLE 6 - TIME OF COMPLETION

- 6.1 Bidder agrees that the furnishing of Goods and Special Services will conform to the schedule set forth in Article 5 of the Agreement.
- 6.2 Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 7 - ATTACHMENTS TO THIS BID

- 7.1 The following documents are attached to and made a condition of this Bid:
 - A. Bid deposit in the amount of _____ dollars (\$_____), consisting of a bid bond in the amount of five percent of the total amount of Bid provided in paragraph 5.3.A of this section.
 - B. A letter from surety indicating that the Bidder currently qualifies for the performance bond required as detailed in these documents
 - C. Evidence of Bidder's qualifications in accordance with Article 5 of this Bid as well as Supplementary Information Specified in Article 5. Include as a separate bound document with cover sheet entitled "Bidders Qualifications and Supporting Technical Information".
 - D. Evidence of authority to sign.

ARTICLE 8 - BID SUBMITTAL

BIDDER: *[Indicate correct name of bidding entity]*

By: _____

[Signature] _____

[Printed name] _____

(If Bidder is a corporation, a limited liability company, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest: _____

[Signature] _____

[Printed name] _____

Title: _____

Submittal Date: _____

Address for giving notices:

Telephone Number: _____

Fax Number: _____

Contact Name and e-mail address: _____

Bidder's License No.: _____

(where applicable)

END OF SECTION

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SECTION 00430

BID BOND

BID BOND

Any singular reference to Bidder, Surety, Owner or other party shall be considered plural where applicable.

BIDDER (*Name and Address*):

SURETY (*Name, and Address of Principal Place of Business*):

OWNER (*Name and Address*):

BID

Bid Due Date:

Description (*Project Name— Include Location*):

BOND

Bond Number:

Date:

Penal sum _____ \$ _____
(Words) (Figures)

Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.

BIDDER

SURETY

Bidder's Name and Corporate Seal

Surety's Name and Corporate Seal

By: _____ By: _____
Signature Signature (Attach Power of Attorney)

Print Name Print Name

Title Title

Attest: _____ Attest: _____
Signature Signature

Title Title

Note: Addresses are to be used for giving any required notice.

Provide execution by any additional parties, such as joint venturers, if necessary.

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond shall be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation shall be null and void if:
 - 3.1 Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
 - 3.2 All Bids are rejected by Owner, or
 - 3.3 Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.
6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after the Bid due date.
7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

SECTION 00520

AGREEMENT

SECTION 00520

AGREEMENT

This Agreement is by and between the Town of Vernon, as requested by its Water Pollution Control Authority hereinafter called Owner and _____ hereinafter called Seller.

Owner and Seller hereby agree as follows:

ARTICLE 1 GOODS AND SPECIAL SERVICES

- 1.1 Seller shall agree to furnish the Goods and Special Services to a Construction Contractor as part of a future construction Project as specified or indicated in these Contract Documents.
- 1.2 It is anticipated that a Construction Contractor (Buyer) will be awarded construction of the Vernon CT Water Pollution Control Facility Upgrade Project on or before July 1, 2019. Based upon the representations by the Seller in its Bid, the Owner intends to direct its Engineer designing the upgrade project to include the Seller's proposal for the Goods and Special Services (exclusive of any proposed contract terms and conditions which are to be negotiated between the Seller and the Buyer) in the contract documents for bidding by the Buyer. The Buyer shall coordinate with the Seller and shall be responsible for installation of the Seller's Goods.
- 1.3 If a contract is not awarded to a Buyer, this agreement between the Owner and the Seller shall become null and void, with no obligations to either party except as otherwise specified in the Agreement.

ARTICLE 2 THE PROJECT

- 2.1 The Project, of which the Goods and Special Services is only a part, is identified with the following title: "Vernon CT Water Pollution Control Facility Upgrade Project". The design of the Project is currently underway with the Owner's Engineer

ARTICLE 3 ENGINEER

- 3.1 The Contract Documents for the Pre-Selection of Goods and Special Services have been prepared by Tighe & Bond, Inc. 53 Southampton Road, Westfield, MA 01085 ("Engineer"), which is to act as Owner's representative, assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with Seller's furnishing of Goods and Special Services.

ARTICLE 4 POINT OF DESTINATION

- 4.1 The Point of Destination is designated as: Water Pollution Control Facility, 100 Windsorville Road, Vernon CT 06066.

ARTICLE 5 CONTRACT TIMES

- 5.1 Time of the Essence
 - A. All time limits for Milestones, if any, including the submittal of Shop Drawings and Samples, the delivery of Goods, and the furnishing of Special Services as stated in the Contract Documents are of the essence of the Contract.

5.2 Milestones

- A. *Assistance to the Engineer:* Seller shall submit all Preliminary Submittals required by the Contract Documents to Owner within 60 days following execution of this agreement. Seller shall submit all other (Non-preliminary) submittals (final shop drawings, product data, samples) required by the Contract Documents to the Buyer for Engineer's review and approval in accordance to the schedule provided by the Contractor under the construction contract. It is the intent of the parties that (1) Engineer conduct such review and issue its approval, or a denial accompanied by substantive comments regarding information needed to gain approval, within 35 days of Seller's submittal of such Shop Drawings and Samples; and (2) resubmittals be limited whenever possible.
- B. *Days to Achieve Delivery of Goods:* The Goods are to be delivered to the Point of Destination and ready for the Buyer's receipt of delivery approval in accordance to the schedule provided by the Buyer under the construction contract.
- C. *Startup and Successful Performance Testing:* The Special Services associated with the startup of the Goods and successful completion of performance testing are to be in accordance to the schedule provided by the Buyer under the construction contract.

5.3 Liquidated Damages

- A. Owner and Seller recognize that Owner's contract with the Buyer will include provisions for Liquidated Damages. The parties also recognize that the timely performance of the Work by the Buyer is materially dependent upon Seller's specific compliance with the requirements of Paragraph 5.2. Further, they recognize the delays, expense, and difficulties involved in proving the actual loss suffered by Owner if complete acceptable Goods are not delivered on time. Accordingly, instead of requiring such proof, Owner and Seller agree that as liquidated damages for delay (but not as a penalty) Seller shall pay Buyer an equitable portion of the \$2,000 per day liquidated damages assessed by the Owner to the Buyer.

ARTICLE 6 CONTRACT PRICE

- 6.1 The Owner agrees to make provisions in the Buyer's contract to all for payments to the Seller to furnish the Goods and Special Services in accordance with these Contract Documents as follows:
 - A. The prices stated in Seller's Bid, as included in Paragraph 5.3.A of the Bid Form.
 - B. If through no fault of the Bidder, the request for bids from general contractors to upgrade the Vernon WPCF project (of which these Goods and Special Services are to be incorporated) is not advertised for bidding within 52 weeks of the date of the Bidder's bid, the Bidder's bid price for the equipment included in the Bid Form, Paragraph 5.3.A "Capital Cost", Item No. 1 will be escalated by the percent change in the published value(s) of the following indexes over the following time period: from the index value published 52 weeks following the Seller's bid date to the index value published just prior to the date the bid for the general contractor to upgrade the Vernon WPCF project is advertised.

1. 20-City ENR Construction Cost Index

ARTICLE 7 PAYMENT PROCEDURES

- 7.1 Seller shall submit Applications for Payment to the Construction Contractor and the Construction Contractor will include them with their own Applications for Payment to the Engineer in accordance with the general conditions to be included in the contract between the Owner and the Construction Contractor. Applications for Payment will be processed by Engineer as provided in the general conditions of Owner and Construction Contractor's contract and in accordance with Clean Water Fund requirements. Seller understands that the Owner and Construction Contractor's contract will include retainage.
- 7.2 Seller shall submit Applications for Payment to the Construction Contractor in amounts that are consistent with the payment schedule provided Article 10 of the General Conditions and Supplementary General Conditions.
- 7.3 If the Owner does not execute an agreement (with the Seller's equipment specified) with the Construction Contractor prior to October 1, 2019, then the Owner has no liability towards the Seller.

ARTICLE 8 INTEREST – NOT USED

ARTICLE 9 SELLER'S REPRESENTATIONS

9.1 Seller makes the following representations:

- A. Seller has examined and carefully studied the Contract Documents, and any data and reference items identified in the Contract Documents, as applicable to Seller's obligations identified in Article 1 above.
- B. If required by the Bidding Documents to visit the Point of Destination and site where the Goods are to be installed or Special Services will be provided, or if, in Seller's judgment, any local condition may affect cost, progress or the furnishing of the Goods and Special Services, Seller has visited the Point of Destination and site where the Goods are to be installed or Special Services will be provided and become familiar with and is satisfied as to the observable local conditions that may affect cost, progress and the furnishing of the Goods and Special Services.
- C. Seller is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, and the furnishing of the Goods and Special Services.
- D. Seller has carefully studied, considered, and correlated the information known to Seller; information commonly known to sellers of similar goods doing business in the locality of the Point of Destination and the site where the Goods will be installed or where Special Services will be provided.
- E. Seller is aware of the general nature of work to be performed by others at the Site that relates to the Goods to be furnished and Special Services to be provided as indicated in the Contract Documents.
- F. Seller has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Seller has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Seller.

- G. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for furnishing Goods and Special Services.
- H. Seller's entry into this Contract constitutes an incontrovertible representation by Seller that without exception all prices in the Agreement are premised upon furnishing the Goods and Special Services required by the Contract Documents.

ARTICLE 10 CONTRACT DOCUMENTS

10.1 Contents

- A. The Contract Documents consist of the following:
 - 1. This Agreement (pages 00520-1 to 00520-7, inclusive);
 - 2. General Conditions (title pages, table of contents, and pages 1 to 31, inclusive);
 - 3. Supplementary Conditions (pages 00800-1 to 00800-14, inclusive);
 - 4. Specifications as listed in table of contents of the Project Manual;
 - 5. Drawings – None
 - 6. Addenda (numbers _____ to _____, inclusive);
 - 7. Exhibits to this Agreement (enumerated as follows):
 - a. Seller's Bid, solely as to the prices set forth therein (pages ____ to ____, inclusive) and including Sellers performance bond pre-approval certification included with the Seller's Bid;
 - b. Documentation submitted by Seller prior to Notice of Award (pages ____ to ____, inclusive);
- B. The documents listed in Paragraph 10.1.A are attached to this Agreement (except as expressly noted otherwise above).
- C. There are no Contract Documents other than those listed above in this Article 10.
- D. The Contract Documents may only be amended, modified, or supplemented as provided in Paragraph 3.04 of the General Conditions.

ARTICLE 11 MISCELLANEOUS

11.1 Terms

- A. Terms used in this Agreement will have the meanings indicated in the General Conditions and the Supplementary Conditions.

11.2 Assignment of Contract

- A. Neither Owner nor Seller shall, without the prior written consent of the other, assign or sublet in whole or in part any interest under any of the Contract Documents. Specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by Laws and Regulations). Unless

specifically stated to the contrary in any written consent to such an assignment, such an assignment will not release or discharge the assignor from any duty or responsibility under the Contract Documents.

11.3 Successors and Assigns

- A. Owner and Seller each binds itself, its successors, assigns, and legal representatives to the other party hereto, its successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

11.4 Severability

- A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Seller. The Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

11.5 Seller Certifications

- A. Seller certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 11.5:
 - 1. “corrupt practice” means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Contract execution;
 - 2. “fraudulent practice” means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
 - 3. “collusive practice” means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and
 - 4. “coercive practice” means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

11.6 Limitations

- A. *Mutual Limitation of Liability*: Owner and Seller further agree that the total liability of each party to the other for claims, costs, losses, and damages arising from this Contract shall be limited to 100% of the amount established in this Agreement as the Contract Price on Bid Form for the Construction Contractor.

11.7 Not Used

11.8 Securities

- A. The Seller shall provide a performance bond guaranteeing that the installed system will meet the Seller's Process Performance Guarantee as specified in Division 11. The performance bond shall be equal to 100 percent of the price of Seller's Goods and Special Services including all items and options selected by the Owner and included in the Construction Contractor's bid price. The performance bond shall be held until all requirements of the Seller's Process Performance Guarantee have been met. All performance bonds signed by an agent must be accompanied by a certified copy of the authority to act. Performance Bonds shall be submitted on the forms included in Section 00610 of the Contract Documents. Additional requirements, are stated in the General or Supplementary Conditions. Suitable form modifications to cover the bonding of the process performance guarantee may be made.
- B. The Seller shall submit their performance bond at the time of the award of a construction contract to the Buyer.
- C. If, at the time of construction contract award to the Buyer, the Seller is unable to provide their performance bond the Owner reserves the right to terminate its agreement with the Seller, invoke the Seller's bid bond, and select the next highest ranked bidder based on the bid evaluation from the pre-selection bid process.
- D. Notice of selection to the Bidder and execution of an Agreement with the Owner to be considered in the design does not constitute the release of the Seller's Bid Bond. The Seller's Bid Bond shall only be released when the Bidder executes an agreement with the Buyer.

IN WITNESS WHEREOF, Owner and Seller have signed this Agreement. Counterparts have been delivered to Owner and Seller. All portions of the Contract Documents have been signed or identified by Owner and Seller or on their behalf.

This Agreement will be effective on _____, _____ (which is the Effective Date of the Agreement).

OWNER:

SELLER:

By: _____

By: _____

Title: _____

Title: _____

[CORPORATE SEAL]

[CORPORATE SEAL]

Attest: _____

Attest: _____

Title: _____

Title: _____

Address for giving notices:

Address for giving notices:

(Attach evidence of authority to sign and resolution or other documents authorizing execution of Owner-Seller Agreement.)

License No. _____

(Where applicable)

(If Seller is a corporation or a partnership, attach evidence of authority to sign.)

END OF SECTION

J:\V\0037 Vernon WWTP\005 WPCF Design\Design\Specifications\Preselection\UV\00520-P.doc

SECTION 00610

PERFORMANCE BOND

PERFORMANCE BOND FOR PROCUREMENT CONTRACTS

Any singular reference to Seller, Surety, Buyer, or other party shall be considered plural where applicable.

SELLER (Name and Address):

SURETY (Name and Address of Principal
Place of Business):

BUYER (Name and Address):

CONTRACT

Date:

Amount:

Description (Name and Location):

BOND

Date (Not earlier than Contract Date):

Bond Number:

Amount:

Modifications to this Bond Form:

Surety and Seller, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Performance Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

Seller as Principal

Company: (Corp. Seal)

Signature:

Name and Title:

Surety

Company: (Corp. Seal)

Signature:

Name and Title:

(Attach Power of Attorney)

Address:

Telephone Number:

(Space is provided below for signatures of additional parties, if required.)

Seller as Principal

Company: (Corp. Seal)

Signature:

Name and Title:

Surety

Company: (Corp. Seal)

Signature:

Name and Title:

Address:

Telephone Number:

1. Seller and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to Buyer for the performance of the Contract, which is incorporated herein by reference. For purposes of this bond, Buyer means Buyer's assigns, if and when Buyer has assigned the Contract.
2. If Seller performs the Contract, Surety and Seller have no obligation under this Bond, except to participate in conferences as provided in Paragraph 3.1.
3. If there is no Buyer Default, Surety's obligation under this Bond shall arise after:
 - 3.1. Buyer has notified Seller and Surety pursuant to Paragraph 10 that Buyer is considering declaring a Seller Default and has requested and attempted to arrange a conference with Seller and Surety to be held not later than 15 days after receipt of such notice to discuss methods of performing the Contract. (If Buyer, Seller, and Surety agree, Seller shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive Buyer's right, if any, subsequently to declare a Seller Default); and
 - 3.2. Buyer has declared a Seller Default and formally terminated Seller's right to complete the Contract. Such Seller Default shall not be declared earlier than 20 days after Seller and Surety have received notice as provided in Paragraph 3.1; and
 - 3.3. Buyer has agreed to pay the Balance of the Contract Price to:
 - a. Surety in accordance with the terms of the Contract;
 - b. Another seller selected pursuant to Paragraph 4.3 to perform the Contract.
4. When Buyer has satisfied the conditions of Paragraph 3, Surety shall promptly and at Surety's expense take one of the following actions:
 - 4.1. Arrange for Seller, with consent of Buyer, to perform and complete the Contract; or
 - 4.2. Undertake to perform and complete the Contract itself, through its agents or through independent contractors; or
 - 4.3. Obtain bids or negotiated proposals from qualified sellers acceptable to Buyer for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by Buyer and a seller selected with Buyer's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the Bonds issued on the Contract, and pay to Buyer the amount of damages as described in Paragraph 6 in excess of the Balance of the Contract Price incurred by Buyer resulting from Seller Default; or
 - 4.4. Waive its right to perform and complete, arrange for completion, or obtain a new seller, and with reasonable promptness under the circumstances, either:
 - a. determine the amount for which it may be liable to Buyer and, as soon as practicable after the amount is determined, tender payment therefor to Buyer; or

- b. deny liability in whole or in part and notify Buyer citing reasons therefor.
5. If Surety does not proceed as provided in Paragraph 4 with reasonable promptness, Surety shall be deemed to be in default on this Bond 15 days after receipt of an additional written notice from Buyer to Surety demanding that Surety perform its obligations under this Bond, and Buyer shall be entitled to enforce any remedy available to Buyer. If Surety proceeds as provided in paragraph 4.4, and Buyer refuses the payment tendered or Surety has denied liability, in whole or in part, without further notice Buyer shall be entitled to enforce any remedy available to Buyer.
6. After Buyer has terminated Seller's right to complete the Contract, and if Surety elects to act under Paragraph 4.1, 4.2, or 4.3, then the responsibilities of Surety to Buyer shall not be greater than those of Seller under the Contract, and the responsibilities of Buyer to Surety shall not be greater than those of Buyer under the Contract. To a limit of the amount of this Bond, but subject to commitment by Buyer of the Balance of the Contract Price to mitigation of costs and damages on the Contract, Surety is obligated without duplication for:
- 6.1. the responsibilities of Seller for correction or replacement of defective Goods and Special Services and completion of the Contract;
- 6.2. Additional legal, design professional, and delay costs resulting from Seller's Default, and resulting from the actions of or failure to act of Surety under Paragraph 4; and
- 6.3. Liquidated damages, or if no liquidated damages are specified in the Contract, actual damages caused by delayed performance or non-performance of Seller.
7. Surety shall not be liable to Buyer or others for obligations of Seller that are unrelated to the Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than Buyer or its heirs, executors, administrators, successors, or assigns.
8. Surety hereby waives notice of any change, including changes of time, to the Contract or to related subcontracts, purchase orders and other obligations.
9. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location of the Point of Destination, and shall be instituted within two years after Seller Default or within two years after Seller ceased working or within two years after Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.
10. Notice to Surety, Buyer or Seller shall be mailed or delivered to the address shown on the signature page.
11. When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Point of Destination, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

12. Definitions.

- 12.1. *Balance of the Contract Price*: The total amount payable by Buyer to Seller under the Contract after all proper adjustments have been made, including allowance to Seller of any amounts received or to be received by Buyer in settlement of insurance or other Claims for damages to which Seller is entitled, reduced by all valid and proper payments made to or on behalf of Seller under the Contract.
- 12.2. *Contract*: The agreement between Buyer and Seller identified on the signature page, including all Contract Documents and changes thereto.
- 12.3. *Seller Default*: Failure of Seller, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Contract.
- 12.4. *Buyer Default*: Failure of Buyer, which has neither been remedied nor waived, to pay Seller as required by the Contract or to perform and complete or comply with the other terms thereof.

SECTION 00700

GENERAL CONDITIONS

STANDARD GENERAL CONDITIONS FOR PROCUREMENT CONTRACTS

Prepared by



and

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STANDARD GENERAL CONDITIONS FOR PROCUREMENT CONTRACTS

ARTICLE 1 - DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

- A. Whenever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to the singular or plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
 2. *Agreement*—The written instrument signed by both Buyer and Seller covering the Goods and Special Services and which lists the Contract Documents in existence on the Effective Date of the Agreement.
 3. *Application for Payment*—The form acceptable to Buyer which is used by Seller in requesting progress and final payments and which is accompanied by such supporting documentation as is required by the Contract Documents.
 4. *Bid*— The offer or proposal of a Seller submitted on the prescribed form setting forth the prices for the Goods and Special Services to be provided.
 5. *Bidder*—The individual or entity that submits a Bid directly to Buyer.
 6. *Bidding Documents*—The Bidding Requirements and the proposed Contract Documents (including all Addenda).
 7. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid security of acceptable form, if any, and Bid Form with any supplements.
 8. *Buyer*—The individual or entity purchasing the Goods and Special Services.
 9. *Change Order*—A document which is signed by Seller and Buyer and authorizes an addition, deletion, or revision to the Contract Documents or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement. Change Orders may be the result of mutual agreement by Buyer and Seller, or of resolution of a Claim.

10. *Claim*—A demand or assertion by Buyer or Seller seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.
11. *Contract*—The entire and integrated written agreement between Buyer and Seller concerning the Goods and Special Services. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.
12. *Contract Documents*—Those items so designated in the Agreement. Shop Drawings and other Seller submittals are not Contract Documents, even if accepted, reviewed, or approved by Engineer or Buyer.
13. *Contract Price*—The moneys payable by Buyer to Seller for furnishing the Goods and Special Services in accordance with the Contract Documents as stated in the Agreement.
14. *Contract Times*—The times stated in the Agreement by which the Goods must be delivered and Special Services must be furnished.
15. *Drawings*—That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Goods and Special Services to be furnished by Seller. Shop Drawings and other Seller submittals are not Drawings as so defined.
16. *Effective Date of the Agreement*—The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.
17. *Engineer*—The individual or entity designated as such in the Agreement.
18. *Field Order*—A written order issued by Engineer which requires minor changes in the Goods or Special Services but which does not involve a change in the Contract Price or Contract Times.
19. *General Requirements*—Sections of Division 1 of the Specifications. The General Requirements pertain to all sections of the Specifications.
20. *Goods*—The tangible and movable personal property that is described in the Contract Documents, regardless of whether the property is to be later attached to realty.
21. *Goods and Special Services*—The full scope of materials, equipment, other items, and services to be furnished by Seller, including Goods, as defined herein, and Special Services, if any, as defined herein. This term refers to both the Goods and the Special Services, or to either the Goods or the Special Services, and to any portion of the Goods or the Special Services, as the context requires.

22. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
23. *Milestone*—A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to the Contract Times.
24. *Notice of Award*—The written notice by Buyer to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Buyer will sign and deliver the Agreement.
25. *Notice to Proceed*—A written notice given by Buyer to Seller fixing the date on which the Contract Times commence to run and on which Seller shall start to perform under the Contract.
26. *Point of Destination*—The specific address of the location where delivery of the Goods shall be made, as stated in the Agreement.
27. *Project*—The total undertaking of which the Goods and Special Services may be the whole, or only a part.
28. *Project Manual*—The documentary information prepared for bidding and furnishing the Goods and Special Services. A listing of the contents of the Project Manual is contained in its table of contents.
29. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Goods and Special Services and which establish the standards by which such portion of the Goods and Special Services will be judged.
30. *Seller*—The individual or entity furnishing the Goods and Special Services.
31. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Seller and submitted by Seller to illustrate some portion of the Goods and Special Services.
32. *Special Services*—Services associated with the Goods to be furnished by Seller as required by the Contract Documents.
33. *Specifications*—That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the furnishing of the Goods and Special Services, and certain administrative requirements and procedural matters applicable thereto.
34. *Successful Bidder*—The Bidder submitting a responsive Bid, to whom Buyer makes an award.

35. *Supplementary Conditions*—That part of the Contract Documents which amends or supplements these General Conditions.
36. *Work Change Directive*—A written statement to Seller issued on or after the Effective Date of the Agreement and signed by Buyer ordering an addition, deletion, or other revision in the Contract Documents with respect to the Goods and Special Services. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

1.02 Terminology

- A. The words and terms discussed in Paragraphs 1.02.B and 1.02.C are not defined, but have the indicated meanings when used in the Bidding Requirements or Contract Documents.

B. *Intent of Certain Terms or Adjectives:*

1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Goods and Special Services. It is intended that such exercise of professional judgment, action, or determination will be commercially reasonable and will be solely to evaluate, in general, the Goods and Special Services for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective shall not be effective to assign to Engineer any duty or authority to supervise or direct the furnishing of Goods or Special Services or any duty or authority to undertake responsibility contrary to any other provision of the Contract Documents.
2. The word “non-conforming” when modifying the words “Goods and Special Services,” “Goods,” or “Special Services,” refers to Goods and Special Services that fail to conform to the Contract Documents.
3. The word “receipt” when referring to the Goods, shall mean the physical taking and possession by the Buyer under the conditions specified in Paragraph 8.01.B.3.
4. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.
5. The word “furnish,” when used in connection with the Goods and Special Services shall mean to supply and deliver said Goods to the Point of Destination (or some other

specified location) and to perform said Special Services fully, all in accordance with the Contract Documents.

- C. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 - PRELIMINARY MATTERS

2.01 *Delivery of Bonds*

- A. When Seller delivers the executed counterparts of the Agreement to Buyer, Seller also shall deliver such bonds as Seller may be required to furnish.

2.02 *Evidence of Insurance*

- A. When Seller delivers the executed counterparts of the Agreement to Buyer, Seller shall deliver to Buyer, with copies to each additional insured identified by name in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Seller is required to purchase and maintain in accordance with Article 4.

2.03 *Copies of Documents*

- A. Buyer shall furnish Seller up to five printed or hard copies of the Contract Documents. Additional copies will be furnished upon request at the cost of reproduction.

2.04 *Commencement of Contract Times; Notice to Proceed*

- A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

2.05 *Designated Representatives*

- A. Buyer and Seller shall each designate its representative at the time the Agreement is signed. Each representative shall have full authority to act on behalf of and make binding decisions in any matter arising out of or relating to the Contract.

2.06 *Progress Schedule*

- A. Within 15 days after the Contract Times start to run, Seller shall submit to Buyer and Engineer an acceptable progress schedule of activities, including at a minimum, Shop Drawing and Sample submittals, tests, and deliveries as required by the Contract Documents. No progress payment will be made to Seller until an acceptable schedule is submitted to Buyer and Engineer.

- B. The progress schedule will be acceptable to Buyer and Engineer if it provides an orderly progression of the submittals, tests, and deliveries to completion within the specified Milestones and the Contract Times. Such acceptance will not impose on Buyer or Engineer responsibility for the progress schedule, for sequencing, scheduling, or progress of the work nor interfere with or relieve Seller from Seller's full responsibility therefor. Such acceptance shall not be deemed to acknowledge the reasonableness and attainability of the schedule.

2.07 *Preliminary Conference*

- A. Within 20 days after the Contract Times start to run, a conference attended by Seller, Buyer, Engineer and others as appropriate will be held to establish a working understanding among the parties as to the Goods and Special Services and to discuss the schedule referred to in Paragraph 2.06.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.

2.08 *Safety*

- A. Buyer and Seller shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss. When Seller's personnel, or the personnel of any subcontractor to Seller, are present at the Point of Destination or any work area or site controlled by Buyer, the Seller shall be responsible for the compliance by such personnel with any applicable requirements of Buyer's safety programs that are made known to Seller.

ARTICLE 3 - CONTRACT DOCUMENTS: INTENT AND AMENDING

3.01 *Intent*

- A. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.
- B. Any labor, documentation, services, materials, or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce or furnish the indicated Goods and Special Services will be provided, whether or not specifically called for, at no additional cost to Buyer.
- C. Clarifications and interpretations of, or notifications of minor variations and deviations in, the Contract Documents, will be issued by Engineer as provided in Article 9.

3.02 *Standards, Specifications, Codes, Laws and Regulations*

- A. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws and Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws and Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

- B. No provision of any such standard, specification, manual or code, or any instruction of a supplier shall be effective to change the duties or responsibilities of Buyer or Engineer, or any of their subcontractors, consultants, agents, or employees from those set forth in the Contract Documents, nor shall any such provision or instruction be effective to assign to Buyer or Engineer, or any of their consultants, agents, or employees any duty or authority to supervise or direct the performance of Seller's obligations or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies:*

1. *Seller's Review of Contract Documents Before the Performance of the Contract:* Before performance of the Contract, Seller shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Seller shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Seller discovers or has actual knowledge of and shall obtain a written interpretation or clarification from Engineer before proceeding with the furnishing of any Goods and Special Services affected thereby.
2. *Seller's Review of Contract Documents During the Performance of the Contract:* If, during the performance of the Contract, Seller discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents or between the Contract Documents and any provision of any Law or Regulation applicable to the performance of the Contract, any standard, specification, manual or code, or of any instruction of any Supplier, Seller shall promptly report it to Engineer in writing. Seller shall not proceed with the furnishing of the Goods and Special Services affected thereby until an amendment to or clarification of the Contract Documents has been issued.
3. Seller shall not be liable to Buyer or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Seller had actual knowledge thereof.

- B. *Resolving Discrepancies:* Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:

1. the provisions of any standard, specification, manual, code, or instruction (whether or not specifically incorporated by reference in the Contract Documents); or
2. the provisions of any Laws or Regulations applicable to the furnishing of the Goods and Special Services (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Amending and Clarifying Contract Documents*

- A. The Contract Documents may be amended to provide for additions, deletions, and revisions to the Goods and Special Services or to modify contractual terms and conditions by a Change Order.
- B. Buyer may issue a Work Change Directive providing for additions, deletions, or revisions to the Goods and Special Services, in which case (1) the Contract Price shall be equitably adjusted to account for any reasonable and necessary credits to Buyer for any such deletion, or for costs (including reasonable overhead and profit) incurred by Seller to accommodate such an addition or revision and (2) the Contract Times shall be equitably adjusted to account for any impact on progress and completion of performance. Such adjustments subsequently shall be duly set forth in a Change Order.
- C. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Goods and Special Services may be authorized, by one or more of the following ways:
 - 1. A Field Order;
 - 2. Engineer's approval of a Shop Drawing or Sample (subject to the provisions of Paragraph 5.06.D.3); or
 - 3. Engineer's written interpretation or clarification.

ARTICLE 4 - BONDS AND INSURANCE

4.01 *Bonds*

- A. Seller shall furnish to Buyer performance and payment bonds, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of all of Seller's obligations under the Contract Documents. These bonds shall remain in effect until 1) one year after the date when final payment becomes due or 2) completion of the correction period specified in Paragraph 8.03, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Seller shall also furnish such other bonds as are required by the Contract Documents.
- B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed each bond.
- C. If the surety on any bond furnished by Seller is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases

to meet the requirements of Paragraph 4.01.B, Seller shall promptly notify Buyer and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 4.01.B and 4.02.

4.02 *Insurance*

- A. Seller shall provide insurance of the types and coverages and in the amounts stipulated in the Supplementary Conditions.
- B. Failure of Buyer to demand certificates of insurance or other evidence of Seller's full compliance with these insurance requirements or failure of Buyer to identify a deficiency in compliance from the evidence provided shall not be construed as a waiver of Seller's obligation to maintain such insurance.
- C. Upon assignment of this Contract, Seller shall comply with the written request of assignee to provide certificates of insurance to assignee.
- D. Buyer does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Seller.
- E. The insurance and insurance limits required herein shall not be deemed as a limitation on Seller's liability under the indemnities granted to Buyer in the Contract Documents.

4.03 *Licensed Sureties and Insurers*

- A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Buyer or Seller shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

ARTICLE 5 - SELLER'S RESPONSIBILITIES

5.01 *Supervision and Superintendence*

- A. Seller shall supervise, inspect, and direct the furnishing of the Goods and Special Services competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform its obligations in accordance with the Contract Documents. Seller shall be solely responsible for the means, methods, techniques, sequences, and procedures necessary to perform its obligations in accordance with the Contract Documents. Seller shall not be responsible for the negligence of Buyer or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure that is shown or indicated in and expressly required by the Contract Documents.

5.02 *Labor, Materials and Equipment*

- A. Seller shall provide competent, qualified and trained personnel in all aspects of its performance of the Contract.
- B. All Goods, and all equipment and material incorporated into the Goods, shall be as specified, and unless specified otherwise in the Contract Documents, shall be:
 - 1. new, and of good quality;
 - 2. protected, assembled, connected, cleaned, and conditioned in accordance with the original manufacturer's instructions; and
 - 3. shop assembled to the greatest extent practicable.

5.03 *Laws and Regulations*

- A. Seller shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of its obligations in accordance with the Contract Documents. Except where otherwise expressly required by such Laws and Regulations, neither Buyer nor Engineer shall be responsible for monitoring Seller's compliance with any Laws or Regulations.
- B. If Seller furnishes Goods and Special Services knowing or having reason to know that such furnishing is contrary to Laws or Regulations, Seller shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such performance. It shall not be Seller's responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this provision shall not relieve Seller of Seller's obligations under Paragraph 3.03.
- C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance shall be the subject of an adjustment in Contract Price or Contract Times. If Buyer and Seller are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 9.06.

5.04 *Or Equals*

- A. Whenever the Goods, or an item of material or equipment to be incorporated into the Goods, are specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular supplier or manufacturer, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item is permitted, other items of material or equipment or material or equipment of other suppliers or manufacturers may be submitted to Buyer for Engineer's review.

1. If in Engineer's sole discretion, such an item of material or equipment proposed by Seller is functionally equal to that named and sufficiently similar so that no change in related work will be required, it may be considered by Engineer as an "or-equal" item.
 2. For the purposes of this paragraph, a proposed item of material or equipment may be considered functionally equal to an item so named only if:
 - a. in the exercise of reasonable judgment, Engineer determines that: 1) it is at least equal in quality, durability, appearance, strength, and design characteristics; 2) it will reliably perform at least equally well the function imposed by the design concept of the completed Project as a functioning whole; 3) it has an acceptable record of performance and availability of responsive service; and
 - b. Seller certifies that if approved: 1) there will be no increase in any cost, including capital, installation or operating costs, to Buyer; and 2) the proposed item will conform substantially to the detailed requirements of the item named in the Contract Documents.
- B. *Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraph 5.04.A. Engineer will be the sole judge of whether to accept or reject such a proposal or submittal. No "or-equal" will be ordered, manufactured or utilized until Engineer's review is complete, which will be evidenced by an approved Shop Drawing. Engineer will advise Buyer and Seller in writing of any negative determination. Notwithstanding Engineer's approval of an "or-equal" item, Seller shall remain obligated to comply with the requirements of the Contract Documents.
- C. *Special Guarantee:* Buyer may require Seller to furnish at Seller's expense a special performance guarantee or other surety with respect to any such proposed "or-equal."
- D. *Data:* Seller shall provide all data in support of any such proposed "or-equal" at Seller's expense.

5.05 *Taxes*

- A. Seller shall be responsible for all taxes and duties arising out of the sale of the Goods and the furnishing of Special Services. All taxes are included in the Contract Price, except as noted in the Supplementary Conditions.

5.06 *Shop Drawings and Samples*

- A. Seller shall submit Shop Drawings and Samples to Buyer for Engineer's review and approval in accordance with the schedule required in Paragraph 2.06.A. All submittals will be identified as required and furnished in the number of copies specified in the Contract Documents. The data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Seller proposes to provide.

B. Where a Shop Drawing or Sample is required by the Contract Documents, any related work performed prior to Engineer's approval of the pertinent submittal will be at the sole expense and responsibility of Seller.

C. *Submittal Procedures:*

1. Before submitting each Shop Drawing or Sample, Seller shall have determined and verified:
 - a. all field measurements (if required), quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto; and
 - b. that all materials are suitable with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the furnishing of Goods and Special Services.
2. Seller shall also have reviewed and coordinated each Shop Drawing or Sample with the Contract Documents.
3. Each submittal shall bear a stamp or include a written certification from Seller that Seller has reviewed the subject submittal and confirmed that it is in compliance with the requirements of the Contract Documents. Both Buyer and Engineer shall be entitled to rely on such certification from Seller.
4. With each submittal, Seller shall give Buyer and Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both in a written communication separate from the submittal and by specific notation on each Shop Drawing or Sample.

D. *Engineer's Review:*

1. Engineer will provide timely review of Shop Drawings and Samples.
2. Engineer's review and approval will be only to determine if the Goods and Special Services covered by the submittals will, after installation or incorporation in the Project, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole.
3. Engineer's review and approval shall not relieve Seller from responsibility for any variation from the requirements of the Contract Documents unless Seller has complied with the requirements of Paragraph 5.06.C.4 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Seller from responsibility for complying with the requirements of Paragraph 5.06.C.1.

E. *Resubmittal Procedures:*

1. Seller shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Seller shall direct specific attention in writing to any revisions other than the corrections called for by Engineer on previous submittals.

5.07 *Continuing Performance*

- A. Seller shall adhere to the progress schedule established in accordance with Paragraph 2.06.A., and the Goods shall be delivered and the Special Services furnished within the Contract Times specified in the Agreement.
- B. Seller shall carry on furnishing of the Goods and Special Services and adhere to the progress schedule during all disputes or disagreements with Buyer. No furnishing of Goods and Special Services shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraphs 11.03 or 11.04, or as Buyer and Seller may otherwise agree in writing.

5.08 *Seller's Warranties and Guarantees*

- A. Seller warrants and guarantees to Buyer that the title to the Goods conveyed shall be proper, its transfer rightful, and free from any security interest, lien, or other encumbrance. Seller shall defend, indemnify, and hold Buyer harmless against any liens, claims, or demands contesting or affecting title of the Goods conveyed.
- B. Seller warrants and guarantees to Buyer that all Goods and Special Services will conform with the Contract Documents, and with the standards established by any Samples approved by Engineer. Engineer shall be entitled to rely on Seller's warranty and guarantee. If the Contract Documents do not otherwise specify the characteristics or the quality of the Goods, the Goods shall comply with the requirements of Paragraph 5.02.B.
- C. Seller's warranty and guarantee hereunder excludes defects or damage caused by:
 1. abuse, improper modification, improper maintenance, or improper operation by persons other than Seller; or
 2. corrosion or chemical attack, unless corrosive or chemically-damaging conditions were disclosed by Buyer in the Contract Documents and the Contract Documents required the Goods to withstand such conditions;
 3. use in a manner contrary to Seller's written instructions for installation, operation, and maintenance; or
 4. normal wear and tear under normal usage.
- D. Seller's obligation to furnish the Goods and Special Services in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Goods and Special Services that are non-conforming, or a release of Seller's obligation to furnish the Goods and Special Services in accordance with the Contract Documents:

1. observations by Buyer or Engineer;
2. recommendation by Engineer or payment by Buyer of any progress or final payment;
3. use of the Goods by Buyer;
4. any acceptance by Buyer (subject to the provisions of Paragraph 8.02.D.1) or any failure to do so;
5. the issuance of a notice of acceptance by Buyer pursuant to the provisions of Article 8;
6. any inspection, test or approval by others; or
7. any correction of non-conforming Goods and Special Services by Buyer.

E. Buyer shall promptly notify Seller of any breach of Seller's warranties or guarantees.

F. Seller makes no implied warranties under this Contract.

5.09 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, Seller shall indemnify and hold harmless Buyer and Engineer, and the officers, directors, members, partners, employees, agents, consultants, contractors, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of Seller's obligations under the Contract Documents, provided that any such claim, cost, loss, or damages attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Goods themselves), including the loss of use resulting therefrom, but only to the extent caused by any negligent act or omission of Seller, or any individual or entity directly or indirectly employed by Seller or anyone for whose acts Seller may be liable.
- B. In any and all claims against Buyer or Engineer or any of their respective assignees, consultants, agents, officers, directors, members, partners, employees, agents, consultants, contractors, or subcontractors, by any employee (or the survivor or personal representative of such employee) of Seller, any subcontractor, any supplier, or any individual or entity directly or indirectly employed by any of them to furnish any of the Goods and Special Services, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 5.09.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for seller or any such subcontractor, supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- C. The indemnification obligations of Seller under Paragraph 5.09.A shall not extend to the liability of Engineer and Engineer's officers, directors, partners, employees, agents, and consultants arising out of:

1. the preparation or approval of, or the failure to prepare or approve, maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

5.10 *Delegation of Professional Design Services*

- A. Seller will not be required to provide professional design services unless such services are specifically required by the Contract Documents or unless such services are required to carry out Seller's responsibilities for furnishing the Goods and Special Services. Seller shall not be required to provide professional services in violation of applicable law.
- B. If professional design services or certifications by a design professional related to the Goods and Special Services are specifically required of Seller by the Contract Documents, Buyer and Engineer will specify all performance and design criteria that such services must satisfy. Seller shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Goods and Special Services designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.
- C. Buyer and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Buyer and Engineer have specified to Seller all performance and design criteria that such services must satisfy.
- D. Pursuant to this Paragraph 5.10, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 5.06.D.2.
- E. Seller shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

ARTICLE 6 - SHIPPING AND DELIVERY

6.01 *Shipping*

- A. Seller shall select the carrier and bear all costs of packaging, transportation, insurance, special handling and any other costs associated with shipment and delivery.

6.02 *Delivery*

- A. Seller shall deliver the Goods F.O.B. the Point of Destination in accordance with the Contract Times set forth in the Agreement, or other date agreed to by Buyer and Seller.
- B. Seller shall provide written notice to Buyer at least 10 days before shipment of the manner of shipment and the anticipated delivery date. The notice shall also include any instructions concerning special equipment or services required at the Point of Destination to unload and care for the Goods. Seller shall also require the carrier to give Buyer at least 24 hours notice by telephone prior to the anticipated time of delivery.
- C. Buyer will be responsible and bear all costs for unloading the Goods from carrier.
- D. Buyer will assure that adequate facilities are available to receive delivery of the Goods during the Contract Times for delivery set forth in the Agreement, or another date agreed by Buyer and Seller.
- E. No partial deliveries shall be allowed, unless permitted or required by the Contract Documents or agreed to in writing by Buyer.

6.03 *Risk of Loss*

- A. Risk of loss and insurable interests transfer from Seller to Buyer upon Buyer's receipt of the Goods.
- B. Notwithstanding the provisions of Paragraph 6.03.A, if Buyer rejects the Goods as non-conforming, the risk of loss on such Goods shall remain with Seller until Seller corrects the non-conformity or Buyer accepts the Goods. If rejected Goods remain at the Point of Destination pending modification and acceptance, then Seller shall be responsible for arranging adequate protection and maintenance of the Goods at Seller's expense.

6.04 *Progress Schedule*

- A. Seller shall adhere to the progress schedule established in accordance with Paragraph 2.06 as it may be adjusted from time to time as provided below.
 - 1. Seller shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.06) proposed adjustments in the progress schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.
 - 2. Proposed adjustments in the progress schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 7. Adjustments in Contract Times may only be made by a Change Order.

ARTICLE 7 - CHANGES: SCHEDULE AND DELAY

7.01 *Changes in the Goods and Special Services*

- A. Buyer may at any time, without notice to any surety, make an addition, deletion, or other revision to the Contract Documents with respect to the Goods and Services, within the general scope of the Contract, by a Change Order or Work Change Directive. Upon receipt of any such document, Seller shall promptly proceed with performance pursuant to the revised Contract Documents (except as otherwise specifically provided).
- B. If Seller concludes that a Work Change Directive issued by Buyer affects the Contract Price or Contract Times, then Seller shall notify Buyer within 15 days after Seller has received the Work Change Directive, and submit written supporting data to Buyer within 45 days after such receipt. If Seller fails to notify Buyer within 15 days, Seller waives any Claim for such adjustment. If Buyer and Seller are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 9.06.
- C. Seller shall not suspend performance while Buyer and Seller are in the process of making such changes and any related adjustments to Contract Price or Contract Times.

7.02 *Changing Contract Price or Contract Times*

- A. The Contract Price or Contract Times may only be changed by a Change Order.
- B. Any Claim for an adjustment in the Contract Price or Contract Times shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 9.06.
- C. If Seller is prevented from delivering the Goods or performing the Special Services within the Contract Times for any unforeseen reason beyond its control and not attributable to its actions or inactions, then Seller shall be entitled to an adjustment of the Contract Times to the extent attributable to such reason. Such reasons include but are not limited to acts or neglect by Buyer, inspection delays, fires, floods, epidemics, abnormal weather conditions, acts of God, and other like matters. If such an event occurs and delays Seller's performance, Seller shall notify Buyer in writing within 15 days of knowing or having reason to know of the beginning of the event causing the delay, stating the reason therefor.
- D. Seller shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Seller. Delays attributable to and within the control of Seller's subcontractors or suppliers shall be deemed to be delays within the control of Seller.
- E. If Seller is prevented from delivering the Goods or furnishing the Special Services within the Contract Times due to the actions or inactions of Buyer, Seller shall be entitled to any reasonable and necessary additional costs arising out of such delay to the extent directly attributable to Buyer.

- F. Neither Buyer nor Seller shall be entitled to any damages arising from delays which are beyond the control of both Buyer and Seller, including but not limited to fires, floods, epidemics, abnormal weather conditions, acts of God, and other like matters.

ARTICLE 8 - BUYER'S RIGHTS

8.01 *Inspections and Testing*

A. *General:*

1. The Contract Documents specify required inspections and tests. Buyer shall have the right to perform, or cause to be performed, reasonable inspections and require reasonable tests of the Goods at Seller's facility, and at the Point of Destination. Seller shall allow Buyer a reasonable time to perform such inspections or tests.
2. Seller shall reimburse Buyer for all expenses, except for travel, lodging, and subsistence expenses of Buyer's and Engineer's representatives, for inspections and tests specified in the Contract Documents. If as the result of any such specified testing the Goods are determined to be non-conforming, then Seller shall also bear the travel, lodging, and subsistence expenses of Buyer's and Engineer's representatives, and all expenses of re-inspection or retesting.
3. Buyer shall bear all expenses of inspections and tests that are not specified in the Contract Documents (other than any re-inspection or retesting resulting from a determination of non-conformity, as set forth in Paragraph 8.01.A.2 immediately above); provided, however, that if as the result of any such non-specified inspections or testing the Goods are determined to be non-conforming, then Seller shall bear all expenses of such inspections and testing, and of any necessary re-inspection and retesting.
4. Seller shall provide Buyer timely written notice of the readiness of the Goods for all inspections, tests, or approvals which the Contract Documents specify are to be observed by Buyer prior to shipment.
5. Buyer will give Seller timely notice of all specified tests, inspections, and approvals of the Goods which are to be conducted at the Point of Destination.
6. If, on the basis of any inspections or testing, the Goods appear to be conforming, Buyer will give Seller prompt notice thereof. If on the basis of said inspections or testing, the Goods appear to be non-conforming, Buyer will give Seller prompt notice thereof and will advise Seller of the remedy Buyer elects under the provisions of Paragraph 8.02.
7. Neither payments made by Buyer to Seller prior to any tests or inspections, nor any tests or inspections shall constitute acceptance of non-conforming Goods, or prejudice Buyer's rights under the Contract.

B. *Inspection on Delivery:*

1. Buyer or Engineer will visually inspect the Goods upon delivery solely for purposes of identifying the Goods and general verification of quantities and observation of apparent condition in order to provide a basis for a progress payment. Such visual inspection will not be construed as final or as receipt of any Goods and Special Services that, as a result of subsequent inspections and tests, are determined to be non-conforming.
2. Within ten days of such visual inspection, Buyer shall provide Seller with written notice of Buyer's determination regarding conformity of the Goods. In the event Buyer does not provide such notice, it will be presumed that the Goods appear to be conforming and that Buyer has acknowledged their receipt upon delivery.
3. If, on the basis of the visual inspection specified in Paragraph 8.01.B.1, the Goods appear to be conforming, Buyer's notice thereof to Seller will acknowledge receipt of the Goods.

C. Final Inspection:

1. After all of the Goods have been incorporated into the Project, tested in accordance with such testing requirements as are specified, and are functioning as indicated, Buyer or Engineer will make a final inspection.
2. If, on the basis of the final inspection, the Goods are conforming, Buyer's notice thereof will constitute Buyer's acceptance of the Goods.
3. If, on the basis of the final inspection, the Goods are non-conforming, Buyer will identify the non-conformity in writing.

8.02 *Non-Conforming Goods and Special Services*

- A. If, on the basis of inspections and testing prior to delivery, the Goods and Special Services are found to be non-conforming, or if at any time after Buyer has acknowledged receipt of delivery and before the expiration of the correction period described in Paragraph 8.03, Buyer determines that the Goods and Special Services are non-conforming, then Seller shall promptly, without cost to Buyer and in response to written instructions from Buyer, either correct such non-conforming Goods and Special Services, or, if Goods are rejected by Buyer, remove and replace the non-conforming Goods with conforming Goods, including all work required for reinstallation.

B. Buyer's Rejection of Non-Conforming Goods:

1. If Buyer elects to reject the Goods in whole or in part, Buyer's notice to Seller will describe in sufficient detail the non-conforming aspect of the Goods. If Goods have been delivered to Buyer, Seller shall promptly, and within the Contract Times, remove and replace the rejected Goods.
2. Seller shall bear all costs, losses and damages attributable to the removal and replacement of the non-conforming Goods as provided in Paragraph 8.02.E.
3. Upon rejection of the Goods, Buyer retains a security interest in the Goods to the extent of any payments made and expenses incurred in their testing and inspection.

C. Remedying Non-Conforming Goods and Special Services:

1. If Buyer elects to permit the Seller to modify the Goods to correct the non-conformance, then Seller shall promptly provide a schedule for such modifications and shall make the Goods conforming within a reasonable time.
2. If Buyer notifies Seller in writing that any of the Special Services are non-conforming, Seller shall promptly provide conforming services acceptable to Buyer. If Seller fails to do so, Buyer may delete the Special Services and reduce the Contract Price a commensurate amount.

D. Buyer's Acceptance of Non-Conforming Goods:

Instead of requiring correction or removal and replacement of non-conforming Goods discovered either before or after final payment, Buyer may accept the non-conforming Goods. Seller shall bear all reasonable costs, losses, and damages attributable to Buyer's evaluation of and determination to accept such non-conforming Goods as provided in Paragraph 8.02.E.

- E. Seller shall pay all claims, costs, losses, and damages, including but not limited to all fees and charges for re-inspection, retesting and for any engineers, architects, attorneys and other professionals, and all court or arbitration or other dispute resolution costs arising out of or relating to the non-conforming Goods and Special Services. Seller's obligations shall include the costs of the correction or removal and replacement of the non-conforming Goods and the replacement of property of Buyer and others destroyed by the correction or removal and replacement of the non-conforming Goods, and obtaining conforming Special Services from others.

F. *Buyer's Rejection of Conforming Goods:*

If Buyer asserts that Goods and Special Services are non-conforming and such Goods and Special Services are determined to be conforming, or if Buyer rejects as non-conforming Goods and Special Services that are later determined to be conforming, then Seller shall be entitled to reimbursement from Buyer of costs incurred by Seller in inspecting, testing, correcting, removing, or replacing the conforming Goods and Special Services, including but not limited to fees and charges of engineers, architects, attorneys and other professionals, and all court or arbitration or other dispute resolution costs associated with the incorrect assertion of non-conformance or rejection of conforming Goods and Special Services.

8.03 *Correction Period*

- A. Seller's responsibility for correcting all non-conformities in the Goods and Special Services will extend for a period of one year after the earlier of the date on which Buyer has placed the Goods in continuous service or the date of final payment, or for such longer period of time as may be prescribed by Laws or Regulations or by the terms of any specific provisions of the Contract Documents.

ARTICLE 9 - ROLE OF ENGINEER

9.01 *Duties and Responsibilities*

- A. The duties and responsibilities and the limitations of authority of Engineer are set forth in the Contract Documents.

9.02 *Clarifications and Interpretations*

- A. Engineer will issue with reasonable promptness such written clarifications or interpretations of the Contract Documents as Engineer may determine necessary, which shall be consistent with or reasonably inferable from the overall intent of the Contract Documents. Such written clarifications and interpretations will be binding on Buyer and Seller. If either Buyer or Seller believes that a written clarification or interpretation justifies an adjustment in the Contract Price or Contract Times, either may make a Claim therefor.

9.03 *Authorized Variations*

- A. Engineer may authorize minor deviations or variations in the Contract Documents by: 1) written approval of specific variations set forth in Shop Drawings when Seller has duly noted such variations as required in Paragraph 5.06.C.4, or 2) a Field Order.

9.04 *Rejecting Non-Conforming Goods and Special Services*

- A. Engineer will have the authority to disapprove or reject Goods and Special Services that Engineer believes to be non-conforming. Engineer will also have authority to require special inspection or testing of the Goods or Special Services as provided in Paragraph 8.01 whether or not the Goods are fabricated or installed, or the Special Services are completed.

9.05 *Decisions on Requirements of Contract Documents*

- A. Engineer will be the initial interpreter of the Contract Documents and judge of the acceptability of the Goods and Special Services. Claims, disputes and other matters relating to the acceptability of the Goods and Special Services or the interpretation of the requirements of the Contract Documents pertaining to Seller's performance will be referred initially to Engineer in writing with a request for a formal decision in accordance with this paragraph.
- B. When functioning as interpreter and judge under this Paragraph 9.05, Engineer will not show partiality to Buyer or Seller and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity. The rendering of a decision by Engineer pursuant to this Paragraph 9.05 with respect to any such Claim, dispute, or other matter (except any which have been waived by the making or acceptance of final payment as provided in Paragraph 10.07) will be a condition precedent to any exercise by Buyer or Seller of such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any such Claim, dispute, or other matter.

9.06 *Claims and Disputes*

- A. *Notice:* Written notice of each Claim relating to the acceptability of the Goods and Special Services or the interpretation of the requirements of the Contract Documents pertaining to either party's performance shall be delivered by the claimant to Engineer and the other party to the Agreement within 15 days after the occurrence of the event giving rise thereto, and written supporting data shall be submitted to Engineer and the other party within 45 days after such occurrence unless Engineer allows an additional period of time to ascertain more accurate data.
- B. *Engineer's Decision:* Engineer will review each such Claim and render a decision in writing within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any.
- C. If Engineer does not render a formal written decision on a Claim within the time stated in Paragraph 9.06.B., Engineer shall be deemed to have issued a decision denying the Claim in its entirety 31 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any.
- D. Engineer's written decision on such Claim or a decision denying the Claim in its entirety that is deemed to have been issued pursuant to Paragraph 9.06.C, will be final and binding upon Buyer and Seller 30 days after it is issued unless within 30 days of issuance Buyer or Seller appeals Engineer's decision by initiating the mediation of such Claim in accordance with the dispute resolution procedures set forth in Article 13.
- E. If Article 13 has been amended to delete the mediation requirement, then Buyer or Seller may appeal Engineer's decision within 30 days of issuance by following the alternative dispute resolution process set forth in Article 13, as amended; or if no such alternative dispute resolution process has been set forth, Buyer or Seller may appeal Engineer's decision by 1) delivering to the other party within 30 days of the date of such decision a written notice of intent to submit the Claim to a court of competent jurisdiction, and 2) within 60 days after the date of such decision instituting a formal proceeding in a court of competent jurisdiction.
- F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 9.06.
- G. The parties agree to endeavor to avoid or resolve Claims through direct, good faith discussions and negotiations whenever practicable. Such discussions and negotiations should at the outset address whether the parties mutually agree to suspend the time periods established in this Paragraph 9.06; if so, a written record of such mutual agreement should be made and jointly executed.

ARTICLE 10 - PAYMENT

10.01 *Applications for Progress Payments*

- A. Seller shall submit to Buyer for Engineer's review Applications for Payment filled out and signed by Seller and accompanied by such supporting documentation as is required by the

Contract Documents and also as Buyer or Engineer may reasonably require. The timing and amounts of progress payments shall be as stipulated in the Agreement.

1. The first application for Payment will be submitted after review and approval by Engineer of all Shop Drawings and of all Samples required by the Contract Documents.
2. The second Application for Payment will be submitted after receipt of the Goods has been acknowledged in accordance with Paragraph 8.01.B and will be accompanied by a bill of sale, invoice, or other documentation reasonably satisfactory to Buyer warranting that Buyer has rightfully received good title to the Goods from Seller and that, upon payment, the Goods will be free and clear of all liens. Such documentation will include releases and waivers from all parties with viable lien rights. In the case of multiple deliveries of Goods, additional Applications for Payment accompanied by the required documentation will be submitted as Buyer acknowledges receipt of additional items of the Goods.

10.02 *Review of Applications for Progress Payments*

- A. Engineer will, within ten days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Buyer, or return the Application to Seller indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Seller may make the necessary corrections and resubmit the Application.
 1. Engineer's recommendation of payment requested in the first Application for Payment will constitute a representation by Engineer, based on Engineer's review of the Application for Payment and the accompanying data, that the Shop Drawings and Samples have been reviewed and approved as required by the Contract Documents and Seller is entitled to payment of the amount recommended.
 2. Engineer's recommendation of payment requested in the Application for Payment submitted upon Buyer's acknowledgment of receipt of the Goods will constitute a representation by Engineer, based on Engineer's review of the Application for Payment and the accompanying data Seller is entitled to payment of the amount recommended. Such recommendation will not constitute a representation that Engineer has made a final inspection of the Goods, that the Goods are free from non-conformities, acceptable or in conformance with the Contract Documents, that Engineer has made any investigation as to Buyer's title to the Goods, that exhaustive or continuous inspections have been made to check the quality or the quantity of the Goods beyond the responsibilities specifically assigned to Engineer in the Contract Documents or that there may not be other matters or issues between the parties that might entitle Seller to additional payments by Buyer or Buyer to withhold payment to Seller.
 3. Engineer may refuse to recommend that all or any part of a progress payment be made, or Engineer may nullify all or any part of any payment previously recommended if, in Engineer's opinion, such recommendation would be incorrect or if on the basis of subsequently discovered evidence or subsequent inspections or tests Engineer considers such refusal or nullification necessary to protect Buyer from loss because the Contract

Price has been reduced, Goods are found to be non-conforming, or Seller has failed to furnish acceptable Special Services.

10.03 *Amount and Timing of Progress Payments*

- A. Subject to Paragraph 10.02.A., the amounts of the progress payments will be as provided in the Agreement. Buyer shall within 30 days after receipt of each Application for Payment with Engineer's recommendation pay Seller the amount recommended; but, in the case of the Application for Payment upon Buyer's acknowledgment of receipt of the Goods, said 30-day period may be extended for so long as is necessary (but in no event more than 60 days) for Buyer to examine the bill of sale and other documentation submitted therewith. Buyer shall notify Seller promptly of any deficiency in the documentation and shall not unreasonably withhold payment.

10.04 *Suspension of or Reduction in Payment*

- A. Buyer may suspend or reduce the amount of progress payments, even though recommended for payment by Engineer, under the following circumstances:
 - 1. Buyer has reasonable grounds to conclude that Seller will not furnish the Goods or the Special Services in accordance with the Contract Documents, and
 - 2. Buyer has requested in writing assurances from Seller that the Goods and Special Services will be delivered or furnished in accordance with the Contract Documents, and Seller has failed to provide adequate assurances within ten days of Buyer's written request.
- B. If Buyer refuses to make payment of the full amount recommended by Engineer, Buyer will provide Seller and Engineer immediate written notice stating the reason for such action and promptly pay Seller any amount remaining after deduction of the amount withheld. Buyer shall promptly pay Seller the amount withheld when Seller corrects the reason for such action to Buyer's satisfaction.

10.05 *Final Application for Payment*

- A. After Seller has corrected all non-conformities to the reasonable satisfaction of Buyer and Engineer, furnished all Special Services, and delivered all documents required by the Contract Documents, Engineer will issue to Buyer and Seller a notice of acceptance. Seller may then make application for final payment following the procedure for progress payments. The final Application for Payment will be accompanied by all documentation called for in the Contract Documents, a list of all unsettled Claims, and such other data and information as Buyer or Engineer may reasonably require.

10.06 *Final Payment*

- A. If, on the basis of final inspection and the review of the final Application for Payment and accompanying documentation, Engineer is reasonably satisfied that Seller has furnished the

Goods and Special Services in accordance with the Contract Documents, and that Seller's has fulfilled all other obligations under the Contract Documents, then Engineer will, within ten days after receipt of the final Application for Payment, recommend in writing final payment subject to the provisions of Paragraph 10.07 and present the Application to Buyer. Otherwise, Engineer will return the Application to Seller, indicating the reasons for refusing to recommend final payment, in which case Seller shall make the necessary corrections and resubmit the Application for payment. If the Application and accompanying documentation are appropriate as to form and substance, Buyer shall, within 30 days after receipt thereof, pay Seller the amount recommended by Engineer, less any sum Buyer is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages to which Buyer is entitled.

10.07 *Waiver of Claims*

A. The making and acceptance of final payment will constitute:

1. a waiver of all Claims by Buyer against Seller, except Claims arising from unsettled liens from non-conformities in the Goods or Special Services appearing after final payment, from Seller's failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Seller's continuing obligations under the Contract Documents; and
2. a waiver of all Claims by Seller against Buyer (other than those previously made in accordance with the requirements herein and listed by Seller as unsettled as required in Paragraph 10.05.A, and not resolved in writing).

ARTICLE 11 - CANCELLATION, SUSPENSION, AND TERMINATION

11.01 *Cancellation*

A. Buyer has the right to cancel the Contract, without cause, at any time prior to delivery of the Goods by written notice. Cancellation pursuant to the terms of this paragraph shall not constitute a breach of contract by Buyer. Upon cancellation:

1. Buyer shall pay Seller for the direct costs incurred in producing any Goods that Seller has specially manufactured for the Project, plus a fair and reasonable amount for overhead and profit.
2. For Goods that are not specially manufactured for the Project, Seller shall be entitled to a restocking charge of 10 percent of the unpaid Contract Price of such Goods.

11.02 *Suspension of Performance by Buyer*

A. Buyer has the right to suspend performance of the Contract for up to a maximum of ninety days, without cause, by written notice. Upon suspension under this paragraph, Seller shall be entitled to an increase in the Contract Times and Contract Price caused by the suspension, provided that performance would not have been suspended or delayed for causes attributable to Seller.

11.03 *Suspension of Performance by Seller*

- A. Subject to the provisions of Paragraph 5.07.B, Seller may suspend the furnishing of the Goods and Special Services only under the following circumstance:
1. Seller has reasonable grounds to conclude that Buyer will not perform its future payment obligations under the Contract; and,
 2. Seller has requested in writing assurances from Buyer that future payments will be made in accordance with the Contract, and Buyer has failed to provide such assurances within ten days of Seller's written request.

11.04 *Breach and Termination*

A. Buyer's Breach:

1. Buyer shall be deemed in breach of the Contract if it fails to comply with any material provision of the Contract Documents, including but not limited to:
 - a. wrongful rejection or revocation of Buyer's acceptance of the Goods,
 - b. failure to make payments in accordance with the Contract Documents, or
 - c. wrongful repudiation of the Contract.
2. Seller shall have the right to terminate the Contract for cause by declaring a breach should Buyer fail to comply with any material provisions of the Contract. Upon termination, Seller shall be entitled to all remedies provided by Laws and Regulations.
 - a. In the event Seller believes Buyer is in breach of its obligations under the Contract, Seller shall provide Buyer with reasonably prompt written notice setting forth in sufficient detail the reasons for declaring that it believes a breach has occurred. Buyer shall have seven days from receipt of the written notice declaring the breach (or such longer period of time as Seller may grant in writing) within which to cure or to proceed diligently to cure such alleged breach.

B. Seller's Breach:

1. Seller shall be deemed in breach of the Contract if it fails to comply with any material provision of the Contract Documents, including, but not limited to:
 - a. failure to deliver the Goods or perform the Special Services in accordance with the Contract Documents,
 - b. wrongful repudiation of the Contract, or
 - c. delivery or furnishing of non-conforming Goods and Special Services.

2. Buyer may terminate Seller's right to perform the Contract for cause by declaring a breach should Seller fail to comply with any material provision of the Contract Documents. Upon termination, Buyer shall be entitled to all remedies provided by Laws and Regulations.
 - a. In the event Buyer believes Seller is in breach of its obligations under the Contract, and except as provided in Paragraph 11.04.B.2.b, Buyer shall provide Seller with reasonably prompt written notice setting forth in sufficient detail the reasons for declaring that it believes a breach has occurred. Seller shall have seven days from receipt of the written notice declaring the breach (or such longer period of time as Buyer may grant in writing) within which to cure or to proceed diligently to cure such alleged breach.
 - b. If and to the extent that Seller has provided a performance bond under the provisions of Paragraph 4.01, the notice and cure procedures of that bond, if any, shall supersede the notice and cure procedures of Paragraph 11.04.B.2.a.

ARTICLE 12 - LICENSES AND FEES

12.01 *Intellectual Property and License Fees*

- A. Unless specifically stated elsewhere in the Contract Documents, Seller is not transferring any intellectual property rights, patent rights, or licenses for the Goods delivered. However, in the event the Seller is manufacturing to Buyer's design, Buyer retains all intellectual property rights in such design.
- B. Seller shall pay all license fees and royalties and assume all costs incident to the use or the furnishing of the Goods, unless specified otherwise by the Contract Documents.

12.02 *Seller's Infringement*

- A. Subject to Paragraph 12.01.A, Seller shall indemnify and hold harmless Buyer, Engineer and their officers, directors, members, partners, employees, agents, consultants, contractors, and subcontractors from and against all claims, costs, losses, damages, and judgments (including but not limited to all reasonable fees and charges of engineers, architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement or alleged infringement of any United States or foreign patent or copyright by any of the Goods as delivered hereunder.
- B. In the event of suit or threat of suit for intellectual property infringement, Buyer will promptly notify Seller of receiving notice thereof.
- C. Seller shall promptly defend the claim or suit, including negotiating a settlement. Seller shall have control over such claim or suit, provided that Seller agrees to bear all expenses and to satisfy any adverse judgment thereof.

1. If Seller fails to defend such suit or claim after written notice by Buyer, Seller will be bound in any subsequent suit or claim against Seller by Buyer by any factual determination in the prior suit or claim.
 2. If Buyer fails to provide Seller the opportunity to defend such suit or claim after written notice by Seller, Buyer shall be barred from any remedy against Seller for such suit or claim.
- D. If a determination is made that Seller has infringed upon intellectual property rights of another, Seller may obtain the necessary licenses for Buyer's benefit, or replace the Goods and provide related design and construction as necessary to avoid the infringement at Seller's own expense.

12.03 *Buyer's Infringement*

- A. Buyer shall indemnify and hold harmless Seller, and its officers, directors, partners, employees, agents, consultants, contractors, and subcontractors from and against all claims, costs, losses, damages, and judgments (including but not limited to all reasonable fees and charges of engineers, architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement or alleged infringement of any United States or foreign patent or copyright caused by Seller's compliance with Buyer's design of the Goods or Buyer's use of the Goods in combination with other materials or equipment in any process (unless intent of such use was known to Seller and Seller had reason to know such infringement would result).
- B. In the event of suit or threat of suit for intellectual property infringement, Seller must after receiving notice thereof promptly notify Buyer.
- C. Upon written notice from Seller, Buyer shall be given the opportunity to defend the claim or suit, including negotiating a settlement. Buyer shall have control over such claim or suit, provided that Buyer agrees to bear all expenses and to satisfy any adverse judgment thereof.
1. If Buyer fails to defend such suit or claim after written notice by Seller, Buyer will be bound in any subsequent suit or claim against Buyer by Seller by any factual determination in the prior suit or claim.
 2. If Seller fails to provide Buyer the opportunity to defend such suit or claim after written notice by Buyer, Seller shall be barred from any remedy against Buyer for such suit or claim.

12.04 *Reuse of Documents*

- A. Neither Seller nor any other person furnishing any of the Goods and Special Services under a direct or indirect contract with Seller shall: (1) acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media versions; or (2) reuse any of such Drawings, Specifications, other documents, or copies thereof on any other project without written consent of Buyer and Engineer and specific written verification or adaptation by Engineer. This prohibition will survive termination or completion of the Contract. Nothing

herein shall preclude Seller from retaining copies of the Contract Documents for record purposes.

12.05 *Electronic Data*

- A. Unless otherwise stated in the Supplementary Conditions, copies of data furnished by Buyer or Engineer to Seller, or by Seller to Buyer or Engineer that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.
- B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. The transferring party will correct any errors detected within the 60-day acceptance period.
- C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

ARTICLE 13 - DISPUTE RESOLUTION

13.01 *Dispute Resolution Method*

- A. Either Buyer or Seller may initiate the mediation of any Claim decided in writing by Engineer under Paragraph 9.06.B or 9.06.C before such decision becomes final and binding. The mediation will be governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the Engineer's decision from becoming final and binding.
- B. Buyer and Seller shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.
- C. If the mediation process does not result in resolution of the Claim, then Engineer's written decision under Paragraph 9.06.B or a denial pursuant to Paragraph 9.06.C shall become final and binding 30 days after termination of the mediation unless, within that time period, Buyer or Seller:
 - 1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions, or

2. agrees with the other party to submit the Claim to another dispute resolution process, or
3. if no dispute resolution process has been provided for in the Supplementary Conditions, delivers to the other party written notice of the intent to submit the Claim to a court of competent jurisdiction, and within 60 days of the termination of the mediation institutes such formal proceeding.

ARTICLE 14 - MISCELLANEOUS

14.01 *Giving Notice*

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if: 1) delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or 2) if delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

14.02 *Controlling Law*

- A. This Contract is to be governed by the law of the state in which the Point of Destination is located.
- B. In the case of any conflict between the express terms of this Contract and the Uniform Commercial Code, as adopted in the state whose law governs, it is the intent of the parties that the express terms of this Contract shall apply.

14.03 *Computation of Time*

- A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day shall be omitted from the computation.

14.04 *Cumulative Remedies*

- A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents, and the provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

14.05 *Survival of Obligations*

- A. All representations, indemnifications, warranties and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the

Contract Documents, will survive final payment, completion, and acceptance of the Goods and Special Services and termination or completion of the Agreement.

14.06 *Entire Agreement*

- A. Buyer and Seller agree that this Agreement is the complete and final agreement between them, and supersedes all prior negotiations, representations, or agreements, either written or oral. This Agreement may not be altered, modified, or amended except in writing signed by an authorized representative of both parties.

SECTION 00800

SUPPLEMENTARY CONDITIONS

SECTION 00800

SUPPLEMENTARY CONDITIONS

PART 1 AMENDMENTS TO GENERAL CONDITIONS

These Supplementary Conditions amend or supplement the Standard Procurement General Conditions (EJCDC P-700, 2010 Edition) and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect.

The terms used in these Supplementary Conditions have the meanings indicated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings indicated below, which are applicable to both the singular and plural thereof.

The address system used in the Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added thereto.

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

SC-1.01 Delete paragraph 1.01.A.8 in its entirety and insert the following in its place:

1.01A.8. Buyer—The individual or entity purchasing the Goods and Special Services. The Owner is not the Buyer.

SC-1.01 Delete paragraph 1.01.A.25 in its entirety.

SC-1.01 Delete paragraph 1.01A.33 in its entirety and insert the following in its place:

1.01A.33. Specifications – Sections included under Division 1 through Division 16 of the Project Manual.

SC-1.01 Add the following new paragraphs immediately after paragraph 1.01A.36:

1.01A.37. Supplier – A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Seller to furnish materials or equipment to be incorporated in the Goods or used to provide Special Services by the Seller.

1.01A.38. Construction Contractor - The person, firm or corporation with whom the Owner will enter into a contract to act as the Buyer and for the general construction of and the installation of the Seller's Goods and performance of Special Services.

1.01A.38. Owner - The Town of Vernon.

ARTICLE 2 – PRELIMINARY MATTERS

SC-2.03 Delete paragraph 2.03A in its entirety and insert the following in its place:

2.03A Owner shall furnish to Seller up to one printed or hard copy of the Contract Documents, and one copy in electronic portable document format (PDF). Additional copies will be furnished upon request at the cost of reproduction.

SC-2.06 Delete Paragraph 2.06 in its entirety.

ARTICLE 3 –CONTRACT DOCUMENTS: INTENT AND AMENDING

SC-3.01 Amend Paragraph 3.01.B by striking out the following text: “to produce or furnish” and replacing with the text “to achieve the specified process parameters or furnish”.

SC-3.01 Add the following new paragraph immediately after paragraph 3.01C:

3.01D Each and every provision of law and clause required by law to be inserted in these Contract Documents shall be deemed to be inserted herein, and they shall be read and enforced as though it were included herein, and if through mistake or otherwise, any such provision is not inserted, or if not correctly inserted, then upon the application of either party, the Contract Documents shall forthwith be physically amended to make such insertion.

ARTICLE 4 – BONDS AND INSURANCE

SC-4.01 Delete 4.01A in its entirety and insert the following in its place:

4.01A Seller shall furnish to Buyer performance bonds in an amount at least equal to the Contract Price (The total Capital Cost indicated in Paragraph 5.3A of the Bid Form), as security for the faithful performance of all of Seller’s obligations under the Contract Documents. This bond shall remain in effect until 1) one year after the date when final payment becomes due 2) completion of the correction period specified in Paragraph 8.03 or 3) completion of the requirements of the performance guarantee specified in Division 11, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Seller shall also furnish such other bonds as are required by the Contract Documents. The performance bond shall be a dual obligee bond listing both the Construction Contractor and the Owner (Town of Vernon) as Dual Obligees.

SC-4.01 Add the following new paragraphs immediately after Paragraph 4.01.C:

4.01D The performance bond shall also guarantee that the installed system meets or exceeds the performance requirements and the Seller’s Process Performance Guarantee included in Division 11 of the Specifications.

4.01E In the event that the performance guarantee requirements of the Division 11 of the Specifications are not met, the Seller shall propose corrective measures to bring the system into conformance as specified in Division 11 at the expense of the Seller. Corrective measures that increase Operation and Maintenance costs beyond guaranteed levels shall be

subject to a penalty. The performance bond shall be called upon to address any shortcomings of the System provided by the Seller and any other contractual obligations of the Seller.

ARTICLE 5 – SELLER’S RESPONSIBILITIES

SC-5.05 Add the following new paragraphs immediately after paragraph 5.05A:

5.05B Owner is exempt from payment of sales and compensating use taxes of the State of Connecticut and of cities and counties thereof on all materials and equipment to be incorporated into the Project facilities.

5.05B.1 Owner will furnish the required certificates of tax exemption to Seller with respect to materials and equipment to be incorporated into the Project facilities.

5.05B.2 Owner’s exemption does not apply to construction tools, machinery, equipment, or other property purchased by or leased by Seller, or to supplies or materials not incorporated into the Project facilities.

5.05B.3 The Contract Price does not include the cost of sales or compensating use taxes to the extent such are exempted by this paragraph.

SC-5.06 Add the following new paragraphs immediately after Paragraph 5.06.E:

5.06F Seller shall furnish required submittals with sufficient information and accuracy in order to obtain required approval of an item with no more than three submittals. Engineer will record Engineer’s time for reviewing subsequent submittals of Shop Drawings, samples, or other items requiring approval and Seller shall reimburse Buyer for Engineer’s charges for such time.

5.06G In the event that Seller requests a change of a previously approved item, Seller shall reimburse Buyer for Engineer’s charges for its review time unless the need for such change is beyond the control of Seller.

SC-5.07 Amend Paragraph 5.07.A by striking out the following language at the start of the paragraph: “Seller shall adhere to the progress schedule established in accordance with Paragraph 2.06.A, and”. Then capitalize the word, “the” which precedes the word “Goods” in this paragraph.

ARTICLE 6 – SHIPPING AND DELIVERY

SC-6.02 Delete paragraphs 6.02.C and 6.02.D in their entirety.

ARTICLE 8 – BUYER’S RIGHTS

- SC-8.02 Amend Paragraph 8.02.B.1 by inserting the words “repair of” in front of the words “remove and replace” in the 3rd line.

ARTICLE 10 - PAYMENT

- SC-10.03 Add the following new paragraph immediately after paragraph 10.03.A:

10.03B Seller shall request payment from Buyer according to the following project milestones:

0% upon completion of Bidder Validation Testing services, if included in the scope of work

0% upon completion of preliminary submittals/shop drawings

10% upon receipt of Purchase Order from Buyer for equipment (10% cumulative total) (note that this is 10% of the lump sum equipment cost bid item, in addition to the validation testing bid item)

10% upon completion of shop drawings (20% cumulative total)

50% upon delivery of equipment to the project site (70% cumulative total)

15% upon successful startup of equipment (85% cumulative total)

15% upon successful completion of the first performance test as specified (100% cumulative total)

where the percentages indicated above represent the percentage of the Seller's contract price exclusive of the cost of the Seller's Two-Year Service Agreement. The above percentages are subject to retainage as specified in Section 00520.

10.03B Seller's Two-year Service Agreement shall be paid according to the following project milestones:

50% 12 months after partial substantial completion.

The 50% balance in equal amounts for each of the visits called for in the agreement for the second year.

where the percentages indicated above represent the percentage of the Seller's contract price for just the Seller's Two-Year Service Agreement.

ARTICLE 11 – CANCELLATION, SUSPENSION, AND TERMINATION

- SC-11.03 Delete paragraph 11.03 in its entirety.

ARTICLE 12 – LICENSES AND DISPUTE RESOLUTION

- SC-12.01 Add the following to the end of Paragraph 12.01A: “In the event the Seller is manufacturing to Owner’s design, Owner retains all intellectual property rights in such design excluding Seller’s proprietary intellectual property and any improvements to Seller’s proprietary intellectual property which shall be and remain the sole and exclusive property of Seller.”

ARTICLE 13 – DISPUTE RESOLUTION

- SC-13.01 Delete paragraph 13.01 in its entirety and insert the following in its place:

13.01 Methods and Procedures

- 13.01A Disputes Subject to Final Resolution: The following disputed matters are subject to final resolution under the provisions of this Article:

13.01A.1 A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full; and

13.01A.2 Disputes between Owner and Seller concerning the Work or obligations under the Contract Documents, and arising after final payment has been made.

- 13.01B Final Resolution of Disputes: For any dispute subject to resolution under this Article, Owner or Seller may:

13.01B.1 elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions; or

13.01B.2 agree with the other party to submit the dispute to another dispute resolution process; or

13.01B.3 if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 14 - MISCELLANEOUS

- SC-14.07 Add the following new paragraphs immediately after paragraph 14.06:

14.07 American Iron and Steel

- 14.07A The Seller acknowledges to and for the benefit of the Owner and the State of Connecticut (the “State”) that it understands the goods and services under this Agreement are being funded with monies made available by the Clean Water State Revolving Fund and/or Drinking Water State Revolving Fund that have statutory requirements commonly known as

“American Iron and Steel;” that requires all of the iron and steel products used in the project to be produced in the United States (“American Iron and Steel Requirement”) including iron and steel products provided by the Seller pursuant to this Agreement. The Seller hereby represents and warrants to and for the benefit of the Owner and the State that (a) the Seller has reviewed and understands the American Iron and Steel Requirement, (b) all of the iron and steel products used in the project will be and/or have been produced in the United States in a manner that complies with the American Iron and Steel Requirement, unless a waiver of the requirement is approved, and (c) the Seller will provide any further verified information, certification or assurance of compliance with this paragraph, or information necessary to support a waiver of the American Iron and Steel Requirement, as may be requested by the Owner or the State. Notwithstanding any other provisions of this Agreement, any failure to comply with this paragraph by the Seller shall permit the Owner or State to recover as damages against the Seller any loss, expense, or cost (including without limitation attorney’s fees) incurred by the Buyer, Owner, or State resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the State or any damages owed to the State by the Buyer or Owner). While the Seller has no direct contractual privity with the State, as a lender to the Owner for the funding of its project, the Owner and the Seller agree that the State is a third-party beneficiary and neither this paragraph (nor any other provision of this Agreement necessary to give this paragraph force or effect) shall be amended or waived without the prior written consent of the State.

14.07B For the purpose of the American Iron and Steel requirement, an iron or steel product is one of the following made primarily of iron or steel (greater than 50% iron or steel, measured by cost):

- Lined or unlined pipes or fittings
- Manhole covers
- Municipal castings (see below)
- Hydrants
- Tanks
- Flanges
- Pipe clamps and restraints
- Valves
- Structural steel (see below)
- Construction materials (see below)
- Reinforced precast concrete (see below)

14.07C Production in the United States of the iron or steel products used in the project requires that all manufacturing processes, including application of coatings, must take place in the United States, with the exception of metallurgical processing involving refinement of steel additives. All manufacturing processes includes processes such as melting, refining, forming, rolling, drawing, finishing, fabricating and coating. Further, if a domestic iron and steel product is taken out of the US for any part of the manufacturing process, it becomes foreign source material. However,

raw materials such as iron ore, limestone and iron and steel scrap are not covered by the AIS requirement, and the material(s), if any, being applied as a coating are similarly not covered. Non-iron or steel components of an iron and steel product may come from non-US sources.

14.07D Municipal castings are cast iron or steel infrastructure products that are melted and cast. Examples of municipal castings are:

- Access hatches
- Ballast screen
- Benches (iron or steel)
- Bollards
- Cast bases
- Cast iron hinged hatches
- Cast iron riser rings
- Catch basin inlet
- Cleanout/monument boxes
- Construction covers and frames
- Curb and corner guards
- Curb openings
- Detectable warning plates
- Downspout shoes (boot, inlet)
- Drainage grates, frames, and curb inlets
- Inlets
- Junction boxes
- Lampposts
- Manhole covers, rings and frames, risers
- Meter boxes
- Service boxes
- Steel hinged hatches
- Steel riser rings
- Trash receptacles
- Tree grates
- Tree guards
- Trench grates
- Valve boxes, covers and risers

14.07E Structural steel is rolled flanged shapes, having at least one dimension of their cross-section three inches or greater, which are used in the construction of bridges, buildings, ships, railroad rolling stock, and for numerous other constructional purposes. Such shapes are designated as wide-flange shapes, standard I-beams, channels, angles, tees and zees. Other shapes include H-piles, sheet piling, tie plates, cross ties, and those for other special purposes.

14.07F Construction materials are those articles, materials, or supplies made primarily of iron and steel (greater than 50% iron or steel, measured by cost), that are permanently incorporated into the project, not including mechanical and/or electrical components, equipment and systems. This includes, but is not limited to, the following products: wire rod, bar, angles, concrete reinforcing bar, wire, wire cloth, wire rope and cables,

tubing, framing, joists, trusses, fasteners (ie., nuts and bolts), welding rods, decking, grating, railings, stairs, access ramps, fire escapes, ladders, wall panels, dome structures, roofing, ductwork, surface drains, cable hanging systems, manhole steps, fencing and fence tubing, guardrails, doors, and stationary screens.

14.07G Mechanical and electrical components, equipment and systems are not considered construction materials. Mechanical equipment is typically that which has motorized parts and/or is powered by a motor. Electrical equipment is typically any machine powered by electricity and includes components that are part of the electrical distribution system. The following examples (including their appurtenances necessary for their intended use and operation) are not considered construction materials: pumps, motors, gear reducers, drives, electric/pneumatic/manual accessories used to operate valves, mixers, gates, motorized screens, blowers/aeration equipment, compressors, meters, sensors, controls and switches, SCADA, membrane bioreactor systems, membrane filtration systems, filters, clarifiers and clarifier mechanisms, rakes, grinders, disinfection systems, presses, conveyors, cranes, HVAC (excluding ductwork), water heaters, heat exchangers, generators, cabinetry and housings, lighting fixtures, electrical conduit, emergency life systems, metal office furniture, shelving, laboratory equipment, analytical instrumentation, and dewatering equipment.

14.07H Reinforced precast concrete: the reinforcing bar and wire must be produced in the US and meet the same standards as for any other iron or steel product. Additionally, the casting of the concrete product must take place in the US. The cement and other raw materials used in concrete production are not required to be of domestic origin.

14.07I The EPA has granted a national De Minimis waiver, which applies to incidental materials used in and incorporated into the project. Individual De Minimis items may not exceed 1% of the total cost of materials used in and incorporated into the project. De Minimis items cumulatively may comprise no more than 5% of the total cost of materials used in and incorporated into the project. To claim coverage under the De Minimis waiver, Contractor shall determine which items are to be covered under the waiver and submit relevant documentation such as invoices to confirm compliance with the De Minimis waiver requirements.

14.07J Refer to Section 01330 for further information on documenting compliance with the American Iron and Steel requirement.

SC-14.08 Add the following new paragraph immediately after paragraph 14.07:

14.08 State and Federal Government Provisions - Comply with the applicable provisions of the State and Federal Requirements included in Part II of the Supplementary Conditions.

PART II – FEDERAL AND STATE GOVERNMENT PROVISIONS

Federal and State Government Provisions referenced or included herein, have been selected from those to which specific references have been made elsewhere in the Contract Documents. Each and every other provision of law or clause required by law to be inserted in this Contract shall be deemed to be also inserted herein in accordance with paragraph 3.01.D of the Supplementary Conditions.

1.0 FEDERAL GOVERNMENT PROVISIONS – (NOT USED)

2.0 STATE PROVISIONS

- 2.1 The Owner and Seller agree that the following State Provisions apply to the Goods to be furnished and the Special Services to be provided under this Contract and that these provisions supersede any conflicting provisions of this Contract.
- 2.2 Applicable provisions of Connecticut General Statutes and Regulations and/or the United States Code and Code of Federal Regulations govern this Contract and any provision in violation of the foregoing shall be deemed null, void and of no effect. Where conflict between Code of Federal Regulations and State Statutes and Regulations exist, the more stringent requirements shall apply.
- 2.3 This project is subject to the Safety and Health Regulations of the U.S. Department of Labor set forth in Title 29 CFR, Part 1926 and to all subsequent amendments, and to the Connecticut Department of Labor Regulations. Seller shall be familiar with the requirements of these regulations.
- 2.4 Connecticut Executive Orders No. 3 and No. 17. See Attachment A of these Supplementary Conditions.
- 2.5 Regulations of Connecticut State Agencies
 - 2.4.1 Section 22a-482, Clean Water Fund. See Attachment B of these Supplementary Conditions.
- 2.6 American Iron and Steel
 - 2.6.1 Refer to Attachment C for further clarification on the American Iron and Steel requirements.

END OF SECTION

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ATTACHMENTS TO SUPPLEMENTARY CONDITIONS

ATTACHMENT A

Connecticut Executive Orders

Connecticut State Library



State Of Connecticut
By His Excellency
Thomas J. Meskill
Governor

Executive Order No. Three

WHEREAS, sections 4-61d(b) and 4-114a of the 1969 supplement to the general statutes require nondiscrimination clauses in state contracts and subcontracts for construction on public buildings, other public works and goods and services, and

WHEREAS, section 4-61e(c) of the 1969 supplement to the general statutes requires the labor department to encourage and enforce compliance with this policy by both employers and labor unions, and to promote equal employment opportunities, and

WHEREAS, the government of this state recognizes the duty and desirability of its leadership in providing equal employment opportunity, by implementing these laws,

NOW, THEREFORE, I, THOMAS J. MESKILL, Governor of the State of Connecticut, acting by virtue of the authority vested in me under section twelve of article fourth of the constitution of the state, as supplemented by section 3-1 of the general statutes, do hereby ORDER and DIRECT, as follows, by this Executive Order:

- I. The labor commissioner shall be responsible for the administration of this Order and shall adopt such regulations as he deems necessary and appropriate to achieve the purposes of this Order. Upon the promulgation of this Order, the commissioner of finance and control shall issue a directive forthwith to all state agencies, that henceforth all state contracts and subcontracts for construction on public buildings, other public works and goods and services shall contain a provision rendering such contract or subcontract subject to this Order, and that such contract or subcontract may be cancelled, terminated or suspended by the labor commissioner for violation of or noncompliance with this Order or state or federal laws concerning nondiscrimination, notwithstanding that the labor commissioner is not a party to such contract or subcontract.
- II. Each contractor having a contract containing the provisions prescribed in section 4-114a of the 1969 supplement to the general statutes, shall file, and shall cause each of his subcontractors to file, compliance reports with the contracting agency or the labor commissioner, as may be directed. Such reports shall be filed within such times and shall contain such information as to employment policies and statistics of the contractor and each subcontractor, and shall be in such form as the labor commissioner may prescribe. Bidders or prospective contractors or subcontractors may be required to state whether they have participated in any previous contract subject to the provisions of this Order or any preceding similar Order, and in that event to submit on behalf of themselves and their proposed subcontractors compliance reports prior to or as an initial part of their bid or negotiation of a contract.
- III. Whenever the contractor or subcontractor has a collective bargaining agreement or other contract or understanding with a labor organization or employment agency as defined in section 31-122 of the general statutes, the compliance report shall identify the said organization or agency and the contracting agency or the labor commissioner may require a compliance report to be filed with the

contracting agency or the labor commissioner, as may be directed, by such organization or agency, signed by an authorized officer or agent of such organization or agency, with supporting information, to the effect that the signer's practices and policies, including but not limited to matters concerning personnel, training, apprenticeship, membership, grievance and representation, and upgrading, do not discriminate on grounds of race, color, religious creed, age, sex or national origin, or ancestry of any individual, and that the signer will either affirmatively cooperate in the implementation of the policy and provisions of this Order, or that it consents and agrees that recruitment, employment and the terms and conditions of employment under the proposed contract shall be in accordance with the purposes and provisions of the Order.

- IV. The labor commissioner may by regulation exempt certain classes of contracts, subcontracts or purchase orders from the implementation of this Order, for standard commercial supplies or raw materials, for less than specified amounts of money or numbers of workers or for subcontractors below a specified tier. The labor commissioner may also provide by regulation for the exemption of facilities of a contractor which are in all respects separate and distinct from activities of the contractor related to the performance of the state contract, provided only that such exemption will not interfere with or impede the implementation of this Order, and provided further, that in the absence of such an exemption, all facilities shall be covered by the provisions of this Order.
- V. Each contracting agency shall be primarily responsible for obtaining compliance with the regulations of the labor commissioner with respect to contracts entered into by such agency or its contractors. All contracting agencies shall comply with the regulations of the labor commissioner in discharging their primary responsibility for securing compliance with the provisions of contracts and otherwise with the terms of this Order and of the regulations of the labor commissioner issued pursuant to this Order. They are directed to cooperate with the labor commissioner and to furnish the labor commissioner such information and assistance as he may require in the performance of his functions under this Order. They are further directed to appoint or designate from among the personnel of each agency, compliance officers, whose duty shall be to seek compliance with the objectives of this Order by conference, conciliation, mediation, or persuasion.
- VI. The labor commissioner may investigate the employment practices and procedures of any state contractor or subcontractor and the practices and policies of any labor organization or employment agency hereinabove described, relating to employment under the state contract, as concerns nondiscrimination by such organization or agency as hereinabove described, or the labor commissioner may initiate such investigation by the appropriate contract agency, to determine whether or not the contractual provisions hereinabove specified or statutes of the state respecting them have been violated. Such investigation shall be conducted in accordance with the procedures established by the labor commissioner and the investigating agency shall report to the labor commissioner any action taken or recommended.
- VII. The labor commissioner shall receive and investigate or cause to be investigated complaints by employees or prospective employees of a state contractor or subcontractor or members or applicants for membership or apprenticeship or training in a labor organization or employment agency hereinabove described, which allege discrimination contrary to the contractual provisions specified hereinabove or state statutes requiring nondiscrimination in employment opportunity. If this investigation is conducted for the labor commissioner by a contracting agency, that agency shall report to the labor commissioner what action has been taken or is recommended with regard to such complaints.
- VIII. The labor commissioner shall use his best efforts, directly and through contracting agencies, other interested federal, state and local agencies, contractors and all other available instrumentalities, including the commission on human rights and opportunities, the executive committee on human

rights and opportunities, and the apprenticeship council under its mandate to provide advice and counsel to the labor commissioner in providing equal employment opportunities to all apprentices and to provide training, employment and upgrading opportunities for disadvantaged workers, in accordance with section 31-51(d) of the 1969 supplement to the general statutes, to cause any labor organization or any employment agency whose members are engaged in work under government contracts or referring workers or providing supervising apprenticeship or training for or in the course of work under a state contract or subcontract to cooperate in the implementation of the purposes of this Order. The labor commissioner shall in appropriate cases notify the commission on human rights and opportunities or other appropriate state or federal agencies whenever it has reason to believe that the practices of any such organization or agency violate equal employment opportunity requirements of state or federal law.

- IX. The labor commissioner or any agency officer or employee in the executive branch designated by regulation of the labor commissioner may hold such hearings, public or private, as the labor commissioner may deem advisable for compliance, enforcement or educational purposes under this Order.
- X. (a) The labor commissioner may hold or cause to be held hearings, prior to imposing ordering or recommending the imposition of penalties and sanctions under this Order. No order for disbarment of any contractor from further state contracts shall be made without affording the contractor an opportunity for a hearing. In accordance with such regulations as the labor commissioner may adopt, the commissioner or the appropriate contracting agency may
1. Publish or cause to be published the names of contractors or labor organizations or employment agencies as hereinabove described which it has concluded have complied or failed to comply with the provisions of this Order or the regulations of the labor commissioner in implementing this Order.
 2. Recommend to the commission on human rights and opportunities that in cases in which there is substantial or material violation or threat thereof of the contractual provision or related state statutes concerned herein, appropriate proceedings be brought to enforce them, including proceedings by the commission on its own motion under chapter 563 of the general statutes and the enjoining, within the limitations of applicable law, of organizations, individuals or groups who prevent directly or indirectly compliance with the provisions of this Order.
 3. Recommend that criminal proceedings be brought under chapter 939 of the general statutes.
 4. Cancel, terminate, suspend or cause to be cancelled, terminated, or suspended in accordance with law any contract or any portion or portions thereof for failure of the contractor or subcontractor to comply with the nondiscrimination provisions of the contract. Contracts may be cancelled, terminated, suspended absolutely or their continuance conditioned upon a program for future compliance approved by the contracting agency.
 5. Provide that any contracting agency shall refrain from entering into any further contracts or extensions or modifications of existing contracts with any contractor until he has satisfied the labor commissioner that he has established and will carry out personnel and employment policies compliant with this Order.
 6. Under regulations prescribed by the labor commissioner each contracting agency shall make reasonable efforts with a reasonable period of time to secure compliance with the contract provisions of this Order by methods of conference, conciliation, mediation or persuasion, before other proceedings shall be instituted under this Order or before a state contract shall

be cancelled or terminated in whole or in part for failure of the contractor or subcontractor to comply with the contract provisions of state statute and this Order.

(b) Any contracting agency taking any action authorized by this Order, whether on its own motion or as directed by the labor commissioner or pursuant to his regulations shall promptly notify him of such action. Whenever the labor commissioner makes a determination under this Order, he shall promptly notify the appropriate contracting agency and other interested federal, state and local agencies of the action recommended. The state and local agency or agencies shall take such action and shall report the results thereof to the labor commissioner within such time as he shall specify.

- XI. If the labor commissioner shall so direct, contracting agencies shall not enter into contracts with any bidder or prospective contractor unless he has satisfactorily complied with the provisions of this Order, or submits a program for compliance acceptable to the labor commissioner, or if the labor commissioner so authorizes, to the contracting agency.
- XII. Whenever a contracting agency cancels or terminates a contract, or a contractor has been disbarred from further government contracts because of noncompliance with the contract provisions with regard to nondiscrimination, the labor commissioner or the contracting agency shall rescind such disbarment, upon the satisfaction of the labor commissioner that the contractor has purged himself of such noncompliance and will thenceforth carry out personnel and employment policies of nondiscrimination in compliance with the provision of this Order.
- XIII. The labor commissioner may delegate to any officer, agency or employee in the executive branch any function or duty of the labor commissioner under this Order except authority to promulgate regulations of a general nature.
- XIV. This Executive Order supplements the Executive Order issued on September 28, 1967. All regulations, orders, instructions, designations and other directives issued heretofore in these premises, including those issued by the heads of various departments or agencies under or pursuant to prior order or statute, shall remain in full force and effect, unless and until revoked or superceded by appropriate authority, to the extent that they are not inconsistent with this Order.

This Order shall become effective thirty days after the date of this Order.

Dated at Hartford, Connecticut, this 16th day of June, 1971

Thomas J. Meskill
Governor

Filed this 16th day of
June, 1971.

Harry Hammer
Secretary Of The State



Connecticut State Library

State Of Connecticut
By His Excellency
Thomas J. Meskill
Governor

Executive Order No. Seventeen

WHEREAS, Section 31-237 of the General Statutes of Connecticut as amended requires the maintaining of the established free services of the Connecticut State Employment Service to both employers and prospective employees and

WHEREAS, Section 31-5 of the General Statutes of Connecticut requires that no compensation or fee shall be charged or received directly or indirectly for the services of the Connecticut State Employment Service and

WHEREAS, large numbers of our citizens who have served in the Armed Forces of our nation are returning to civilian life in our state and seeking employment in civilian occupations and

WHEREAS, we owe a duty as well as gratitude to these returning veterans including the duty to find suitable employment for them and

WHEREAS, many of our handicapped citizens are fully capable of employment and are entitled to be placed in suitable employment and

WHEREAS, many of the citizens of our state who are unemployed are unaware of the job openings and employment opportunities which do in fact exist in our state and

WHEREAS, notwithstanding the free services of the Connecticut State Employment Service, many of our Connecticut employers do not use its free services or do not avail themselves fully of all the services offered,

NOW, THEREFORE, I, THOMAS J. MESKILL, Governor of the State of Connecticut, acting by virtue of the authority vested in me under the fourth article of the Constitution of the State and in accordance with Section 3-1 of the General Statutes, do hereby ORDER and direct, as follows, by this Executive Order:

- I. The Labor Commissioner shall be responsible for the administration of this Order and shall do all acts necessary and appropriate to achieve its purpose. Upon promulgation of this Order, the Commissioner of Finance and Control shall issue a directive forthwith to all state agencies, that henceforth all state contracts and subcontracts for construction on public buildings, other public works and goods and services shall contain a provision rendering such contract or subcontract subject to this Order, and that such contract or subcontract may be cancelled, terminated or suspended by the Labor Commissioner for violation of or noncompliance with this Order, notwithstanding that the Labor Commissioner is not a party to such contract or subcontract.
- II. Every contractor and subcontractor having a contract with the state or any of its agencies, boards, commissions, or departments, every individual partnership, corporation, or business entity having business with the state or who or which seeks to do business with the state, and every bidder or

prospective bidder who submits a bid or replies to an invitation to bid on any state contract shall list all employment openings with the office of the Connecticut State Employment Service in the area where the work is to be performed or where the services are to be rendered.

- III. All state contracts shall contain a clause which shall be a condition of the contract that the contractor and any subcontractor holding a contract directly under the contractor shall list all employment openings with the Connecticut State Employment Service. The Labor Commissioner may allow exceptions to listings of employment openings which the contractor proposes to fill from within its organization from employees on the rolls of the contractor on the date of publication of the invitation to bid or the date on which the public announcement was published or promulgated advising of the program concerned.
- IV. Each contracting agency of the state shall be primarily responsible for obtaining compliance with this Executive Order. Each contracting agency shall appoint or designate from among its personnel one or more persons who shall be responsible for compliance with the objectives of this Order.
- V. The Labor Commissioner shall be and is hereby empowered to inspect the books, records, payroll and personnel data of each individual or business entity subject to this Executive Order and may hold hearings or conferences, formal or informal, in pursuance of the duties and responsibilities hereunto delegated to the Labor Commissioner.
- VI. The Labor Commissioner or any agency officer or employee in the executive branch designated by regulation of the Labor Commissioner may hold such hearings, public or private, as the Labor Commissioner may deem advisable for compliance, enforcement or educational purposes under this Order.
- VII. (a) The Labor Commissioner may hold or cause to be held hearings, prior to imposing, ordering, or recommending the imposition of penalties and sanctions under this Order. In accordance herewith, the Commissioner or the appropriate contracting agency may suspend, cancel, terminate, or cause to be suspended, cancelled, or terminated in accordance with law any contract or portion or portions thereof for failure of the contractor or subcontractor to comply with the listing provisions of the contract. Contracts may be cancelled, terminated, suspended absolutely or their continuance conditioned upon a program for future compliance approved by the contracting agency.

(b) Any contracting agency taking any action authorized by this Order, whether on its own motion or as directed by the Labor Commissioner, shall promptly notify him of such action. Whenever the Labor Commissioner makes a determination under this Order, he shall promptly notify the appropriate contracting agency of the action recommended. The agency shall report the results to the Labor Commissioner promptly.
- VIII. If the Labor Commissioner shall so direct, contracting agencies shall not enter into contracts with any bidder or prospective contractor unless he has satisfactorily complied with the provisions of this Order.

This Order shall become effective sixty days after the date of this Order.

Dated at Hartford, Connecticut, this 15th day of February 1973.

Thomas J. Meskill
Governor

ATTACHMENT B

**State Required Construction Contract Provisions Under
Department of Environmental Protection's Clean Water Fund**

**REQUIRED CONSTRUCTION CONTRACT PROVISIONS
UNDER THE CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION'S
CLEAN WATER FUND**

Sec. 22a-482-4 (g) Required Provisions for Construction Contracts.

Municipalities must include, when appropriate, the following clauses or their equivalent in each subagreement and may substitute other terms for "grantee" and "contractor" in their subagreements.

- (1) Supersession. The municipality and the contractor agree that the following general provisions or their equivalent apply to eligible work to be performed under this contract and that these provisions supersede any conflicting provisions of this contract;
- (2) Privity of contract. This contract is expected to be funded in part by the State of Connecticut. Neither the State, nor any of its departments, agencies, or employees is or will be a party to this contract or any lower tier subcontract. This contract is to be subject to regulations adopted in accordance with Section 22a-482 of the Connecticut General Statutes.
- (3) Changes for contracts for construction.
 - (A) The municipality may, at any time, without notice to any surety, by written order designated or indicated to be a change order, make any change in the work within the general scope of the subagreement, including but not limited to changes:
 - (i) In the specifications (including drawings and designs);
 - (ii) In the time, method, or manner of performance of the work;
 - (iii) In the municipality-furnished facilities, equipment, materials, services, or site; or
 - (iv) Directing acceleration in the performance of the work.
 - (B) A change order shall also be any other written or oral order (including direction, instruction, interpretation or determination) from the municipality which causes any change, provided the contractor gives the municipality written notice stating the date, circumstances, and source of the order and that the contractor regards the order as a change order.
 - (C) Except as provided in this clause, no order, statement, or conduct of the municipality shall be treated as a change under this clause or entitle the contractor to an equitable adjustment.
 - (D) If any change under this clause causes an increase or decrease in the contractor's cost or the time required to perform any part of the work under this contract, whether or not changed by any order, an equitable adjustment shall be made and the subagreement modified in writing. However, for claims based on defective specifications, no claim for any change under (B) above shall be allowed for any costs incurred more than 20 days before the contractor gives written notice as required in paragraph (B). In the case of defective specifications for which the municipality is responsible, the equitable adjustment shall include any increased cost reasonably incurred by the contractor in attempting to comply with those defective specifications.

- (E) If the contractor intends to assert a claim for an equitable adjustment under this clause, he must, within thirty (30) days after receipt of a written change order under (A) of this change clause or the furnishing of a written notice under (B) of this clause, submit to the grantee a written statement setting forth the general nature and monetary extent of such claim. The municipality may extend the 30-day period. The statement of claim may be included in the notice under (B) of this clause.
 - (F) No claim by the contractor for an equitable adjustment shall be allowed if made after final payment under this contract.
- (4) Changes for contracts for supplies.
 - (A) The municipality may at any time, by a written order and without notice to the sureties, make changes within the general scope of this subagreement in any one or more of the following:
 - (i) Drawings, designs, or specifications, where the supplies to be furnished are to be specially manufactured for the municipality;
 - (ii) Method of shipment or packing; and
 - (iii) Place of delivery.
 - (B) If any change causes an increase or decrease in the cost or the time required to perform any part of the work under this subagreement, whether or not changed by any such order, an equitable adjustment shall be made in the subagreement price or delivery schedule, or both, and the subagreement shall be modified in writing. Any claim by the contractor for adjustment under this clause must be asserted within 30 days from the date of receipt by the contractor of the notification of change. If the municipality decides that the facts justify such action, the municipality may receive and act upon any such claim asserted at any time before final payment under this subagreement. Where the cost of property made obsolete or excess as a result of a change is included in the contractor's claim for adjustment, the grantee shall have the right to prescribe the manner of disposition of such property. Nothing in this clause shall excuse the contractor from proceeding with the subagreement as changed.
- (5) Differing site conditions.
 - (A) The contractor shall promptly, and before such conditions are disturbed, notify the municipality in writing of:
 - (i) Subsurface or latent physical conditions at the site differing materially from those indicated in this subagreement; or
 - (ii) Unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in this subagreement. The municipality shall promptly investigate the conditions and, if it finds that conditions are materially different and will cause an increase or decrease in the contractor's cost or the time required to perform any part of the work under this

subagreement, whether or not changed as a result of such conditions, an equitable adjustment shall be made and the subagreement modified in writing.

- (B) No claim of the contractor under this clause shall be allowed unless the contractor has given notice required in (A) of this clause. However, the municipality may extend the prescribed time.
- (C) No claim by the contractor for an equitable adjustment shall be allowed if asserted after final payment under this subagreement.

(6) Suspension of work.

- (A) The municipality may order the Contractor, in writing, to suspend, delay, or interrupt all or any part of the work for such period of time as the municipality may determine to be appropriate for the convenience of the municipality.
- (B) If the performance of all or any part of the work is suspended, delayed, or interrupted for an unreasonable period of time by an act of the municipality in administration of the contract, (or if no time is specified, within a reasonable time), an adjustment shall be made for any increase in the cost of performance of this contract (excluding profit) necessarily caused by such unreasonable suspension, delay, or interruption and the contract modified in writing. However, no adjustment shall be made under this clause for any suspension, delay, or interruption to the extent that performance would have been so suspended, delayed, or interrupted by any other cause, including the fault or negligence of the contractor, or for which an equitable adjustment is provided for or excluded under any other provision of the contract.
- (C) No claim under this clause shall be allowed for any costs incurred more than 20 days before the contractor notified the municipality in writing of the act or failure to act involved (this requirement does not apply to a claim resulting from a suspension order), and unless the claim, in an amount stated, is asserted in writing as soon as practicable after the termination of such suspension, delay, or interruption, but not later than the date of final payment under the contract.

(7) Termination.

- (A) This contract may be terminated in whole or in part in writing by either party in the event of substantial failure by the party to fulfill its obligations under this subagreement through no fault of the terminating party, provided that no termination may be effected unless the other party is given not less than ten (10) calendar days written notice (delivered by certified mail, return receipt requested) of intent to terminate and an opportunity for consultation with the terminating party prior to termination.
- (B) This contract may be terminated in whole or in part in writing by the municipality for its convenience, provided that the contractor is given not excess than ten (10) calendar days written notice (delivered by certified mail, return receipt requested) of intent to terminate and an opportunity for consultation with the terminating party prior to termination.

- (C) If termination for default is effected by the municipality, an equitable adjustment in the price provided for in this contract shall be made but no amount shall be allowed for anticipated profit on unperformed services or other work, and any payment due to the contractor at the time of termination may be adjusted to cover any additional costs to the municipality because of the contractor's default. If termination for default is effected by the contractor, or if termination for convenience is effected by the municipality, the equitable adjustment shall include a reasonable profit for services or other work performed. The equitable adjustment for any termination shall provide for payment to the contractor for services rendered and expenses incurred prior to the termination in addition to termination settlement costs reasonably incurred by the contractor relating to commitments which had become firm prior to the termination.
 - (D) Upon receipt of a termination action pursuant to (A) or (B) above, the contractor shall promptly discontinue all services affected (unless the notice directs otherwise), and deliver or otherwise make available to the recipient all data, drawings, specifications, reports, estimates, summaries and such other information and materials as may have been accumulated by the contractor in performing this contract whether completed or in process.
 - (E) Upon termination under (A) or (B) of this clause the municipality may take over the work and may award another party a contract to complete the work under this contract.
 - (F) If, after termination for failure of the contractor to fulfill contractual obligations, it is determined that the contractor had not failed to fulfill contractual obligations, the termination shall be deemed to have been for the convenience of the municipality. In such event, adjustment of the price provided for in this contract shall be made as provided in (C) of this clause.
- (8) Remedies. Except as may be otherwise provided in this contract, all claims, counterclaims, disputes, and other matters in question between the municipality and the contractor arising out of or relating to this contract or the breach thereof will be decided by arbitration if the parties mutually agree or in a court of competent jurisdiction within the district in which the municipality is located.
- (9) Price reduction for defective cost or pricing data.

NOTE - This clause is applicable to any contract negotiated between the municipality and its contractor in excess of \$500,000; negotiated change orders in excess of \$500,000 or 10 percent of the contract, whichever is less, affecting the price of a formally advertised, competitively awarded, fixed price contract; or any lower tier subcontract or purchase order in excess of \$500,000 or 10 percent of the assistance agreement, whichever is less, under a contract other than a formally advertised, competitively awarded, fixed price subagreement. This clause is not applicable for contracts to the extent that they are awarded on the basis of effective price competition.

The contractor and subcontractor, where appropriate, warrant that cost and pricing data submitted for evaluation with respect to negotiation of prices for negotiated contracts, lower tier subcontracts and change orders is based on current, accurate, and complete data supported by their books and records. If the municipality or the Commissioner determines that any price (including profit) negotiated in connection with this contract, any lower tier

subcontract, or any amendment thereunder was increased by any significant sums because the data provided was incomplete, inaccurate, or not current at the time of submission, then such price, cost or profit shall be reduced accordingly, and the contract shall be modified in writing to reflect such reduction. Failure to agree on a reduction shall be subject to the remedies clause of this agreement.

NOTE - Since the contract is subject to reduction under this clause by reason of defective cost or pricing data submitted in connection with lower tier subcontracts, the contractor may wish to include a clause in each lower tier subcontract requiring the lower tier subcontractor to appropriately indemnify the contractor. It is also expected that any lower tier subcontractor subject to such indemnification will generally require substantially similar indemnification for defective cost or pricing data required to be submitted by lower tier contractors.

(10) Audit; Access to records.

- (A) The contractor shall maintain books, records, documents, and other evidence directly pertinent to performance on grant work under this contract in accordance with generally accepted accounting principles and practices consistently applied. The contractor shall also maintain the financial information and data used by the contractor in the preparation or support of the cost submission required under Section 22a-482-4(g)(8) for any negotiated contract or change order and a copy of the cost summary submitted to the municipality. The municipality and the Commissioner or any of his authorized representatives shall have access to all such books, records, documents, and other evidence for the purpose of inspection, audit and copying during normal business hours. The contractor will provide proper facilities for such access and inspection.
- (B) If this is a formally advertised, competitively awarded, fixed price contract, the contractor agrees to make (A) through (F) of this clause applicable to all negotiated change orders and contract amendments affecting the contract price. In the case of all other types of prime contracts, the contractor agrees to include (A) through (F) of this clause in all his subcontracts in excess of \$10,000 and to make paragraphs (A) through (F) of this clause applicable to all change orders directly related to project performance.
- (C) Audits conducted under this provision shall be in accordance with generally accepted auditing standards and established procedures and guidelines of the reviewing or audit departments and meeting the requirements of Section 20-282 of the Connecticut General Statutes.
- (D) The contractor agrees to disclose all information and reports resulting from access to records under (A) and (B) of this clause.
- (E) Records under (A) and (B) above shall be maintained and made available during performance on assisted work under this contract and until three years from the date of final State payment for the project. In addition, those records which relate to any dispute appeal arising under a grant assistance agreement, to litigation, to the settlement of claims arising out of such performance, or to costs or items to which an audit exception has been taken, shall be maintained and made available until three years after the date of resolution of such appeal, litigation, claim, or exception.

- (F) This right of access clause (with respect to financial records) applies to:
- (i) Negotiated prime subagreements;
 - (ii) Negotiated change orders or contract amendments in excess of \$10,000 affecting the price of any formally advertised, competitively awarded, fixed price contract; and
 - (iii) Subcontracts or purchase orders under any contract other than a formally advertised, competitively awarded, fixed price contract. However, this right of access does not apply to a prime contract, lower tier subcontract, or purchase order awarded after effective price competition, except with respect to records pertaining directly to contract performance, (excluding any financial records of the contractor); if there is any indication that fraud, gross abuse, or corrupt practices may be involved or if the contract is terminated for default or for convenience.
- (11) Covenant against contingent fees. The contractor warrants that no person or selling agency has been employed or retained to solicit or secure this contract upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by the contractor for the purpose of securing business. For breach or violation of this warranty the grantee shall have the right to annul this agreement without liability or, at its discretion, to deduct from the contract price or consideration, or otherwise recover the full amount of such commission, percentage, brokerage, or contingent fee.
- (12) Gratuities.
- (A) If the municipality finds, after a notice and hearing, that the contractor, or any of the contractor's agents or representatives, offered or gave gratuities (in the form of entertainment, gifts, or otherwise), to any official, employee, or agent of the municipality or the State, in an attempt to secure a contract or favorable treatment in awarding, amending, or making any determinations related to the performance of this agreement, the municipality may, by written notice to the contractor, terminate this agreement. The municipality may also pursue other rights and remedies that the law or this agreement provides. However, the existence of the facts on which the municipality bases such findings shall be in issue and may be reviewed in proceedings under the Remedies clause of this agreement.
 - (B) In the event this contract is terminated, as provided in (A) in this clause, the recipient may pursue the same remedies against the contractor as it could pursue in the event of a breach of the contract by the contractor and, as a penalty, in addition to any other damages to which it may be entitled by law, to exemplary damages in an amount (as determined by the grantee) which shall be not less than three nor more than ten times the costs the contractor incurs in providing any such gratuities to any such officer or employee.
- (13) Responsibility of the contractor.

- (A) The contractor agrees to perform all work under this agreement in accordance with this agreement's designs, drawings, and specifications.
 - (B) The contractor warrants and guarantees for a period of one (1) year from the date of substantial completion of the system that the completed system is free from all defects due to faulty materials, equipment or workmanship; and the contractor shall promptly make whatever adjustments or corrections necessary to cure such defects, including repairs of any damage to other parts of the system resulting from such defects. The municipality shall give notice to the contractor of observed defects with reasonable promptness. In the event that the contractor fails to make adjustments, repairs, corrections or other work that may be made necessary by such defect, the municipality may do so and charge the contractor the cost incurred. The performance bond shall remain in full force and effect through the guarantee period.
 - (C) The contractor's obligations under this clause are in addition to the contractor's other express or applied warranties under this agreement or State law and in no way diminish any other rights that the municipality may have against the contractor for faulty material, equipment, or work.
- (14) Final payment. Upon satisfactory completion of the work performed under this agreement, as a condition before final payment under this agreement, or as a termination settlement under this agreement, the contractor shall execute and deliver to the municipality a release of all claims against the municipality arising under or by virtue of this agreement, except claims which are specifically exempted by the contractor to be set forth therein. Unless otherwise provided in this agreement or by State law or otherwise expressly agreed to by the parties to this agreement, final payment under this agreement or settlement upon termination of this agreement shall not constitute a waiver of the municipality's claims against the contractor or his sureties under this agreement or applicable performance and payment bonds.

Sec. 22a-482-4 (h) Procurement Requirements-General

- (1) Applicability. This defines the responsibilities of the State and the municipality and the minimum procurement standards for each municipality's procurement system.
- (2) Municipality responsibility.
 - (A) The municipality is responsible for the settlement and satisfactory completion in accordance with sound business judgement and good administrative practice of all contractual and administrative issues arising out of subagreements entered into under the assistance agreement. This includes issuance of invitations for bids or requests for proposals, selection of contractors, award of subagreements, settlement of protests, claims, disputes and other related procurement matters.
 - (B) The municipality shall maintain a subagreement administration system to assure that contractors perform in accordance with the terms, conditions and specifications of their subagreements.
 - (C) The municipality shall review its proposed procurement actions to avoid purchasing unnecessary or duplicative items.

- (D) The municipality shall consider consolidating its procurement or dividing it into parts to obtain a more economical purchase.
 - (E) Where appropriate, the municipality shall make an analysis of lease versus purchase alternatives in its procurement actions.
 - (F) A municipality may request technical assistance from the Commissioner for the administration and enforcement of any subagreement awarded under this section. However, such assistance does not relieve the municipality of its responsibilities under this section.
 - (G) A municipality may use innovative procurement methods or procedures only if it receives the Commissioner's prior written approval.
- (3) Municipality reporting requirements. The municipality shall request, in writing, the Commissioner's authorization to award each construction subagreement which has an aggregate value over \$10,000. The request shall include:
- (A) Name, address, telephone number and employee identification number of the construction contractor;
 - (B) Amount of the award;
 - (C) Estimated starting and completion dates;
 - (D) Project number, name and site location of the project; and
 - (E) Copy of the tabulations of bids or offers and the name of each bidder or offeror.
- (4) Copies of contract documents. The municipality must promptly submit to the Commissioner copies of any prime contract or modification thereof, and revisions to plans and specifications.
- (5) Limitations on subagreement award.
- (A) The municipality shall award subagreements only to responsible contractors that possess the potential ability to perform successfully under the terms and conditions of a proposed procurement. A responsible contractor is one that has:
 - (i) Financial resources, technical qualifications, experience, an organization and facilities adequate to carry out the project, or a demonstrated ability to obtain these;
 - (ii) Resources to meet the completion schedule contained in the subagreement;
 - (iii) A satisfactory performance record for completion of subagreements;
 - (iv) Accounting and auditing procedures adequate to control property, funds and assets; and

- (v) Demonstrated compliance or willingness to comply with the civil rights, equal employment opportunity, labor laws and other statutory requirements.
- (B) The municipality shall not make awards to contractors who have been suspended or debarred by Connecticut State Agencies.
- (6) Violations. The municipality shall refer violations of law to the local or State officials having the proper jurisdiction.
- (7) Competition.
 - (A) The municipality shall conduct all procurement transactions in a manner that provides maximum open and free competition.
 - (B) Procurement practices shall not unduly restrict or eliminate competition. Examples of practices considered to be unduly restrictive include:
 - (i) Noncompetitive practices between firms;
 - (ii) Organizational conflicts of interest;
 - (iii) Unnecessary, experience and bonding requirements;
 - (iv) Local laws, ordinances, regulations or procedures which give local bidders or proposers preference over other bidders or proposers in evaluating bids or proposals; and
 - (v) Placing unreasonable requirements on firms in order for them to qualify to do business.
 - (C) The municipality may use a prequalification list(s) of persons, firms or products if it:
 - (i) Updates its prequalified list(s) at least every six months;
 - (ii) Reviews and acts on each request for prequalification made more than thirty (30) days before the closing date for receipt of proposals or bid opening; and
 - (iii) Gives adequate public notice of its prequalification procedures in accordance with the public notice procedures.
 - (D) A municipality may not use a prequalified list(s) of persons or firms if the procedure unnecessarily restricts competition.
- (8) Profit.
 - (A) Municipalities must assure that only fair and reasonable profits are paid to contractors awarded subagreements under State assistance agreements.
 - (B) The municipality shall negotiate profit as a separate element of price for each subagreement in which there is no price competition, or where price is based on cost analysis.

- (C) Where the municipality receives two or more bids, profit included in a formally advertised, competitively bid, fixed price subagreement shall be considered reasonable.
 - (D) Off-the-shelf or catalog supplies are exempt from this section.
- (9) Use of small, minority, and women's businesses. The municipality must take affirmative steps to assure that small, minority, and women's businesses are used to the maximum extent practicable. The Commissioner may impose goals as conditions of financial assistances.
- (10) Privity of subagreement. The State shall not be a party to any subagreement nor to any solicitation or request for proposals.
- (11) Documentation.
- (A) Procurement records and files for procurements in excess of \$10,000 shall include the following:
 - (i) Basis for contractor selection;
 - (ii) Written justification for selection of the procurement method;
 - (iii) Written justification for use of any specification which does not provide for maximum free and open competition;
 - (iv) Written justification for the type of subagreement;
 - (v) Basis for award cost or price, including a copy of the cost or price analysis made and documentation of negotiations; and
 - (vi) A municipality must state the reasons in writing for rejecting any or all bids and the justification for procurements on a noncompetitively negotiated basis and make them available for public inspection.
- (12) Specifications.
- (A) Nonrestrictive specifications.
 - (i) No specification for bids or statement of work in connection with such works shall be written in such a manner as to contain proprietary, exclusionary or discriminatory requirements other than those based upon performance, unless such requirements are necessary to test or demonstrate a specific thing or to provide for necessary interchangeability of parts and equipment, or at least two brand names or trade names of comparable quality or utility are listed and are followed by the words "or equal". If brand or trade names are specified, the municipality must be prepared to identify to the Commissioner, or in any protest action, the salient requirements (relating to the minimum needs of the project) which must be met by any offeror. The single base bid method of solicitation for equipment and parts for determination of a low, responsive bidder may not be utilized. With regard to materials, if a single

material is specified, the municipality must be prepared to substantiate the basis for the selection of the material.

- (ii) Project specifications shall, to the extent practicable, provide for maximum use of structures, machines, products, materials, construction methods, and equipment which are readily available through competitive procurement, or through standard or proven production techniques, methods, and processes.
 - (B) Sole source restriction. A specification shall not require the use of structures, materials, equipment, or processes which are known to be available only from a sole source, unless the Commissioner determines in advance that the municipality's engineer has adequately justified in writing that the proposed use meets the particular project's minimum needs or the Commissioner determines that use of a single source is necessary to promote innovation.
 - (C) Experience clause restriction. The general use of experience clauses requiring equipment manufacturers to have a record of satisfactory operation for a specified period of time or of bonds or deposits to guarantee replacement in the event of failure is restricted to special cases where the municipality's engineer adequately justifies any such requirement in writing. Where such justification has been made, submission of a bond or deposit shall be permitted instead of a specified experience period. The period of time for which the bond or deposit is required should not exceed the experience period specified.
- (13) Force account work.
- (A) The municipality must receive the Commissioner's prior written approval for use of the force account method for any planning, design work or construction work.
 - (B) The Commissioner may approve the force account method upon the municipality's demonstration that it possesses the necessary competence required to accomplish such work and that the work can be accomplished more economically by use of the force account method, or emergency circumstances dictate its use.
 - (C) Use of the force account method for construction work shall generally be limited to minor portions of a project.
- (14) Code of conduct.
- (A) The municipality shall maintain a written code or standards of conduct which shall govern the performance of its officers, employees, or agents engaged in the award and administration of subagreements supported by State funds. No employee, officer or agent of the municipality shall participate in the selection, award or administration of a subagreement supported by State funds if a conflict of interest, real or apparent, would be involved.
 - (B) Such a conflict would arise when:
 - (i) Any employee, officer or agent of the municipality, any member of the immediate families, or their partners, have a financial or other interest in the firm selected for award; or

- (ii) An organization which may receive or has been awarded a subagreement employs, or is about to employ, any person under (B)(i) of this Section.
 - (C) The municipality's officers, employees or agents shall neither solicit nor accept gratuities, favors or anything of monetary value from contractors, potential contractors or other parties to subagreements.
 - (D) Municipalities may set minimum rules where the financial interest is not substantial or the gift is an unsolicited item of nominal value.
 - (E) To the extent permitted by State or local law or regulations, the municipality's code of conduct shall provide for penalties, sanctions or other disciplinary actions for violations of the code by the municipality's officers, employees or agents or by contractors or their agents.
- (15) Payment to consultants.
- (A) For all State assistance agreements, the State will limit its participation in the salary rate (excluding overhead) paid to individual consultants retained by a municipality or by a municipality's contractors or subcontractors to the maximum daily rate for a GS-18 federal employee. (Municipality's may, however, pay contractors and subcontractors more than this amount.) This limitation applies to consultation services of designated individuals with specialized skills who are paid at a daily or hourly rate. The rate does not include transportation and subsistence costs for travel performed; municipality's will pay these in accordance with their normal travel reimbursement practices.
 - (B) Subagreements with firms for services which are awarded using these procurement requirements are not affected by this limitation.
- (16) Cost and price considerations.
- (A) The municipality shall conduct a cost analysis of all negotiated change orders and all negotiated subagreements estimated to exceed \$10,000.
 - (B) The municipality shall conduct a price analysis of all formally advertised procurements estimated to exceed \$10,000 if there are fewer than three bidders.
 - (C) For negotiated procurement, contractors and subcontractors shall submit cost or pricing data in support of their proposals to the municipality.
- (17) Small purchases.
- (A) Small Purchase Procurement. If the aggregate amount involved in any one procurement transaction does not exceed \$10,000, including estimated handling and freight charges, overhead and profit, the municipality may use small purchase procedures.

- (B) Small Purchase Procedures. Small purchase procedures are relatively simple procurement methods that are sound and appropriate for procurement of services, supplies or other property costing in the aggregate not more than \$10,000.
 - (C) Requirements for Competition.
 - (i) Municipalities shall not divide a procurement into smaller parts to avoid the dollar limitation for competitive procurement.
 - (ii) Municipalities shall obtain price or rate quotations from an adequate number of qualified sources.
- (18) Negotiation and award of subagreements.
- (A) Unless the request for proposals states that award may be based on initial offers alone, the municipality must conduct meaningful negotiations with the best qualified offerors with acceptable proposals within the competitive range, and permit revisions to obtain best and final offers. The best qualified offerors must have equal opportunities to negotiate or revise their proposals. During negotiations, the municipality must not disclose the identity of competing offerors or any information from competing proposals.
 - (B) The municipality must award the subagreement to the responsible offeror whose proposal is determined in writing to be the most advantageous to the municipality, taking into consideration price and other evaluation criteria set forth in the request for proposals.
 - (C) The municipality must promptly notify unsuccessful offerors that their proposals were rejected.
 - (D) The municipality must document its procurement file to indicate how proposals were evaluated, what factors were used to determine the best qualified offerors within the competitive range, and what factors were used to determine the subagreement award.
- (19) Optional selection procedure for negotiation and award of subagreement for architectural and engineering services.
- (A) The municipality may evaluate and select an architect or engineer using the procedures in this subdivision in place of the procedures in "Negotiation and award of subagreements" in subdivision (18).
 - (B) The municipality may use responses from requests for statement of qualifications to determine the most technically qualified architects or engineers.
 - (C) After selecting and ranking the most qualified architects or engineers, the municipality will request technical proposals from those architects or engineers and inform them of the evaluation criteria the municipality will use to rank the proposals.

- (D) The municipality shall then select and determine, in writing, the best technical proposal.
 - (E) After selecting the best proposal, the municipality shall attempt to negotiate fair and reasonable compensation with that offeror.
 - (F) If the municipality and the offeror of the best proposal cannot agree on the amount of compensation, the municipality shall formally terminate negotiations with that offeror. The municipality shall then negotiate with the offeror with the next best proposal. This process will continue until the municipality reaches agreement on compensation with an offeror with an acceptable proposal. Once the municipality terminates negotiations with an offeror, the municipality cannot go back and renegotiate with that offeror.
- (20) Noncompetitive negotiation procurement method. Noncompetitive negotiation may be used only when the award of a subagreement is not feasible under small purchase, formal advertising, or competitive negotiation procedures. The municipality may award a noncompetitively negotiated subagreement only under the following circumstances:
- (A) The item is available only from a single source;
 - (B) A public exigency or emergency exists and the urgency for the requirement will not permit a delay incident to competitive procurement; or
 - (C) After solicitation from a number of sources, competition is determined to be inadequate.
- (21) Use of the same architect or engineer during construction
- (A) If the municipality is satisfied with the qualifications and performance of the architect or engineer who provided any or all of the planning or design services for the project, it may wish to retain that firm or individual during construction of the project. The municipality may do so without further public notice and evaluation of qualifications provided that it received financial assistance for the planning and/or design services and selected the architect or engineer in accordance with these procurement regulations.
 - (B) However, if the municipality uses the procedures in (A) to retain an architect or engineer, any construction subagreements between the architect or engineer and the municipality must meet the procurement provisions of Section 22a-482-4(i)(5).
- (22) Negotiation of subagreements.
- (A) Formal advertising, with adequate purchase descriptions, sealed bids, and public openings shall be the required method of procurement unless negotiation under (B) of this section is necessary to accomplish sound procurement.
 - (B) All negotiated procurement shall be conducted in a manner to provide to the maximum practicable extent open and free competition appropriate to the type of project work to be performed. The municipality is authorized to negotiate subagreements if any of the following conditions exist:

- (i) Public exigency will not permit the delay incident to formally advertised procurement (e.g. an emergency procurement);
 - (ii) The aggregate amount involved does not exceed \$10,000;
 - (iii) The material or service to be procured is available from only one person or entity. If the procurement is expected to aggregate more than \$10,000, the municipality must document its file with a justification of the need for noncompetitive procurement, and provide such documentation to the Commissioner on request;
 - (iv) The procurement is for personal or professional services (including architectural or engineering services) or for any service that a university or other educational institution may render;
 - (v) No responsive, responsible bids at acceptable price levels have been received after formal advertising, and the Commissioner's prior written approval has been obtained;
 - (vi) The procurement is for materials or services where the price is established by law;
 - (vii) The procurement is for technical items or equipment requiring standardization and interchangeability of parts with existing equipment; or
 - (viii) The procurement is for experimental, developmental or research services.
- (23) Enforcement. If the Commissioner determines that the municipality has failed to comply with any of these procurement provisions, he or she may impose any of the following sanctions:
- (A) The grant may be terminated or annulled under Section 22a-482-4(t).
 - (B) Project costs directly related to the noncompliance may be disallowed.
 - (C) Payment otherwise due to the municipality of up to 10 percent may be withheld.
 - (D) Project work may be suspended under Sec. 22a-482-4(g) (5).
 - (E) A noncomplying municipality may be found nonresponsible or ineligible for future state funding assistance or a noncomplying contractor may be found nonresponsible or ineligible for approval for future contract award under state grants.
 - (F) An injunction may be entered or other equitable relief afforded by a court of appropriate jurisdiction.
 - (G) Such other administrative or judicial action may be instituted if it is legally available and appropriate.

- (24) **Contract Enforcement.** Commissioner authority. At the request of a municipality, the Commissioner is authorized to provide technical and legal assistance in the administration and enforcement of any contract related to pollution abatement facilities for which a State grant was made and to intervene in any civil action involving the enforcement of such contracts, including contract disputes which are the subject of either arbitration or court action in accordance with the requirements of Section 22a-482-4(f)(1).

Sec. 22a-482-4 (j) Construction Contract Procurement Requirements

(This section applies to construction contracts in excess of \$10,000 awarded by municipalities for any construction projects.

- (1) **Type of Contract.** Each contract shall be a fixed price (lump sum or unit price or a combination of the two) contract, unless the Commissioner gives advance written approval for the municipality to use some other acceptable type of contract. The cost-plus percentage-of-cost contract shall not be used in any event.
- (2) **Formal Advertising.** Each contract shall be awarded after formal advertising, unless negotiations are permitted in accordance with Sec. 22a-482-4(h)(18). Formal advertising shall be in accordance with the following:
- (A) **Adequate public notice.** The municipality will cause adequate notice to be given of the solicitation by publication in newspapers or journals of general circulation beyond the municipality's locality (statewide, generally), inviting bids on the project work and stating the method by which bidding documents may be obtained or examined. Where the estimated cost of construction is \$10 million or more, the municipality should publish the notice in trade journals of nationwide distribution. The municipality may solicit bids directly from bidders if it maintains a bidders list;
- (B) **Adequate time for preparing bids.** Adequate time, generally not less than 30 days, must be allowed between the date when public notice is first published and the date by which bids must be submitted. Bidding documents (including specifications and drawings) shall be available to prospective bidders from the date when such notice is first published;
- (C) **Adequate bidding documents.** The municipality shall prepare a reasonable number of bidding documents (invitations for bids) and shall furnish them upon request on a first-come, first-served basis. The municipality shall maintain a complete set of bidding documents and shall make them available for inspection and copying by any party. The bidding documents shall include:
- (i) A complete statement of the work to be performed, including necessary drawings and specifications, and the required completion schedule;
- (ii) The terms and conditions of the contract to be awarded;
- (iii) A clear explanation of the method of bidding and the method of evaluation of bid prices, and the basis and method for award of the contract;

(iv) Responsibility requirements or criteria which will be employed in evaluating bidders;

(v) The following statement:

Any contract or contracts awarded under this invitation for bids are expected to be funded in part by the State of Connecticut (Department of Environmental Protection). Neither the State of Connecticut nor any of its departments, agencies or employees is or will be a party to this invitation for bids or any resulting contract. This procurement will be subject to the requirements contained in Section 22a-482-4, (h), (j) and (o) of the regulations of Connecticut State Agencies; (vi) A copy of Sec. 22a-482-4, (h), (j) and (o); and

(vi) The prevailing State Wage Determination as applicable.

(D) Sealed bids. The municipality shall provide for bidding by sealed bid and for the safeguarding of bids received until public opening.

(E) Addenda to bidding documents. If a municipality desires to amend any part of the bidding documents (including drawings and specifications) during the period when bids are being prepared, the addenda shall be communicated in writing to all firms which have obtained bidding documents at least five (5) working days prior to the bid opening.

(F) Bid modifications. A firm which has submitted a bid shall be allowed to modify or withdraw its bid before the time of bid opening.

(G) Public opening of bids. The municipality shall provide for a public opening of bids at the place, date and time announced in the bidding documents.

(H) Award to the low, responsive, responsible bidder.

(i) After bids are opened, the municipality shall evaluate them in accordance with the methods and criteria set forth in the bidding documents.

(ii) The municipality may reserve the right to reject all bids. Unless all bids are rejected for good cause, award shall be made to the low, responsive, responsible bidder.

(iii) If the municipality intends to make the award to a firm which did not submit the lowest bid, it shall prepare a written statement before any award, explaining why each lower bidder was deemed nonresponsive or nonresponsive. The Municipality shall retain such statement in its files and forward a copy to the Commissioner for review.

(iv) Local laws, ordinances, regulations or procedures which are designed or which operate to give local bidders preference over other bidders shall not be employed in evaluating bids.

- (v) If an unresolved procurement review issue or a protest relates only to award of a subcontract or procurement of an item under the prime contract, and resolution of that issue or protest is unduly delaying performance of the prime contract, the Commissioner may authorize award and performance of the prime contract before resolution of the issue or protest, if the Commissioner determines that resolution of the protest will not affect the placement of the prime contract bidders and will not materially affect initial performance of the prime contract; and that award of the prime contract is in the State's best interest, will not materially affect resolution of the protest, and is not barred by State or local law.
- (vi) The municipality shall not reject a bid as nonresponsive for failure to list or otherwise indicate the selection of a subcontractor(s) or equipment, unless the municipality has unambiguously stated in the solicitation documents that such failure to list shall render a bid nonresponsive and shall cause rejection of a bid.

Sec. 22a-482-4 (k) Negotiation of Contract Amendments (Change Orders)

- (1) The Municipality is responsible for the negotiation of construction contract change orders. This function may be performed by the municipality directly or, if authorized, by its engineer. During negotiations with the contractor the municipality shall:
 - (A) Make certain that the contractor has a clear understanding of the scope and extent of work and other essential requirements;
 - (B) Assure that the contractor demonstrates that he will make available or will obtain the necessary personnel, equipment and materials to accomplish the work within the required time; and
 - (C) Assure a fair and reasonable price for the required work.
- (2) The contract price or time may be changed only by a change order. When negotiations are required, they shall be conducted in accordance with Section 22a-482(k)(3) and (4) as appropriate. The value of any work covered by a change order or of any claim for increase or decrease in the contract price shall be determined by the method set forth in paragraphs (2)(A) through (2)(C) of this section, whichever is most advantageous to the municipality.
 - (A) Unit prices.
 - (i) Original bid items. Unit prices previously approved are acceptable for pricing changes of original bid items. However, when changes in quantities exceed 15 percent of the original bid quantity and the total dollar change of that bid item is significant, the municipality shall review the unit price to determine if a new unit price should be negotiated.
 - (ii) New items. Unit prices of new items shall be negotiated.
 - (B) A lump sum to be negotiated.
 - (C) Cost reimbursement. The actual cost for labor, direct overhead, materials, supplies, equipment, and other services necessary to complete the work plus an amount to be agreed upon to cover the cost of general overhead and profit to be negotiated.

- (3) For each change order not in excess of \$100,000 the contractor shall submit sufficient cost and pricing data to the municipality to enable the municipality to determine the necessity and reasonableness of costs and amounts proposed, and the allowability and eligibility of costs proposed.
- (4) For each change order in excess of \$100,000, the contractor shall submit to the municipality for review sufficient cost and pricing data as described in paragraphs (4)(A) through (4)(E) of this section to enable the municipality to ascertain the necessity and reasonableness of costs and amounts proposed, and the allowability and eligibility of costs proposed.
 - (A) The contractor shall certify that proposed costs reflect complete, current, and accurate cost and pricing data applicable to the date of the change order.
 - (B) In addition to the specific elements of cost, the estimated amount of profit shall be set forth separately in the cost summary for fixed price change orders and a specific total dollar amount of profit will be set forth separately in the cost summary for cost reimbursement change orders.
 - (C) The municipality may require more detailed cost data in order to substantiate the reasonableness of proposed change order costs. The Commissioner may, on a selected basis, perform a detailed cost analysis on any change order.
 - (D) For costs under cost reimbursement change orders, the contractor shall have an accounting system which accounts for such costs in accordance with generally accepted accounting principles. This system shall provide for the identification, accumulation and segregation of allowable and unallowable change orders. Allowable change order costs shall be determined in accordance with Sections 22a-482-4(a), (b) and (c). The contractor must propose and account for such costs in a manner consistent with his normal accounting procedures.
 - (E) Change orders awarded on the basis of review of a cost element summary and a certification of complete, current, and accurate cost and pricing data shall be subject to downward renegotiation and recoupment of funds where a subsequent audit substantiates that such certification was not based on complete, current and accurate cost and pricing data.
- (5) Review by Commissioner. The municipality shall submit, before the execution of any change order in excess of \$100,000, to the Commissioner for review and approval:
 - (A) The cost and pricing data the contractor submitted;
 - (B) A certification of review and acceptance of the contractor's cost or price; and
 - (C) A copy of the proposed change order.
- (6) Profit. The objective of negotiations shall be the exercise of sound business judgement and good administrative practice including the determination of a fair and reasonable profit based on the contractor's assumption of risk and input to total performance and not merely the application of a predetermined percentage factor. For the purpose of negotiated change orders to construction contracts profit is defined as the net proceeds obtained by deducting all

allowable costs (direct and indirect) from the price. The municipality should review the estimate of profit as it reviews all other elements of price.

- (7) Related work. Related work shall not be split into two amendments or change orders merely to keep it under \$100,000 and thereby avoid the requirements of (4) of this section. For change orders which include both additive and deductive items:

- (A) If any single item (additive or deductive) exceeds \$100,000 the requirements of (4) of this section shall be applicable;
- (B) If no single additive or deductive item has a value of \$100,000 but the total price of the change order is over \$100,000, the requirements of (4) of this section shall be applicable; and
- (C) If the total of additive items of work in the change order exceeds \$100,000 or the total of deductive items of work in the change order exceeds \$100,000 and the net price of the change order is less than \$100,000, the requirements of (4) of this section shall be applicable.

Sec. 22a-482-4 (l) Subcontracts under Construction Contracts

- (1) The award or execution of subcontracts by a prime contractor under a construction contract awarded to the prime contractor by the municipality, and the procurement and negotiation procedures used by prime contractors in awarding or executing subcontracts are not required to comply with any of the provisions, selection procedures, policies or principles set forth in Section 22a-482-4(h) or (j) except those specifically stated in this section. In addition, the bid protest procedures of Section 22a-482-4(o) are not available to parties executing subcontracts with prime contractors except as specifically provided in that section.
- (2) The award or execution of subcontracts by a prime contractor under a formally advertised, competitively bid, fixed price construction contract awarded to the prime contractor by the municipality, and the procurement and negotiation procedures used by such prime contractors in awarding or executing such subcontracts must comply with any municipality procurement system, State small, minority and women's business policy, (Section 22a-482-4(f)(9)), negotiation of contract amendments (Section 22a-482-4(i)), and clauses (8) and (9) of Section 22a-482-4(e).

Sec. 22a-482-4 (m) Progress Payments to Contractors

- (1) Except as State law otherwise provides, municipalities must make prompt progress payments to prime contractors and prime contractors should make prompt progress payments to subcontractors and suppliers for eligible construction, material, and equipment costs, including those of undelivered, specifically manufactured equipment, incurred under a contract under this program. The Clean Water Fund shall only be obligated to pay the municipality amounts that the municipality is actually going to pay contractors.
- (2) Conditions of progress payments. For purposes of this section, progress payments are defined as follows:
 - (A) Payments for work in place;

- (B) Payments for materials or equipment which have been delivered to the construction site, or which are stockpiled in the vicinity of the construction site, in accordance with the terms of the contract, when conditional or final acceptance is made by or for the municipality. The municipality shall assure that items for which progress payments have been made are adequately insured and are protected through appropriate security measures. Costs of such insurance and security are allowable costs; or
 - (C) Payments for undelivered specifically manufactured items or equipment (excluding off-the-shelf or catalog items) as work on them progresses. Such payments must be made if provisions therefor are included in the bid and contract documents. Such provisions may be included at the option of the municipality only when all of the following conditions exist:
 - (i) The equipment is so designated in the project specifications;
 - (ii) The equipment to be specifically manufactured for the project could not be readily utilized on nor diverted to another job; and
 - (iii) A fabrication period of more than 6 months is anticipated.
- (3) Protection of progress payments made for specifically manufactured equipment. The municipality will assure protection of the State's interest in progress payments made for items or equipment referred to in (2)(C) of this section. The protection must be acceptable to the municipality and must take the form of:
- (A) Securities negotiable without recourse, condition or restrictions, a progress payment bond, or an irrevocable letter of credit provided to the municipality through the prime contractor by the subcontractor or supplier; and
 - (B) For items or equipment in excess of \$200,000 in value which are manufactured in a jurisdiction in which the Uniform Commercial Code is applicable, the creation and perfection of a security interest under the Uniform Commercial Code which is reasonably adequate to protect the interests of the municipality.
- (4) Limitations on progress payments for specifically manufactured equipment.
- (A) Progress payments made for specifically manufactured equipment or items shall be limited to the following:
 - (i) A first payment upon submission by the prime contractor of shop drawings for the equipment or items in an amount not exceeding 15 percent of the contract or item price plus appropriate and allowable higher tier costs; and
 - (ii) Subsequent to the municipality's release or approval for manufacture, additional payments not more frequently than monthly thereafter up to 75 percent of the contract or item price plus appropriate and allowable higher tier costs. However, payment may also be made in accordance with the contract and grant terms and conditions for ancillary onsite work before delivery of the specifically manufactured equipment or items.

- (B) In no case may progress payments for undelivered equipment or items under (4)(A)(i) or (4)(A)(ii) of this section be made in an amount greater than 75 percent of the cumulative incurred costs allocable to contract performance with respect to the equipment or items. Submission of a request for any such progress payments must be accompanied by a certification furnished by the fabricator of the equipment or item that the amount of progress payment claimed constitutes not more than 75 percent of cumulative incurred costs allocable to contract performance and, in addition, in the case of the first progress payment request a certification that the amount claimed does not exceed 15 percent of the contract or item price quoted by the fabricator.
 - (C) As used in this section, the term "costs allocable to contract performance" with respect to undelivered equipment or items includes all expenses of contract performance which are reasonable, allocable to the contract, consistent with sound and generally accepted accounting principles and practices consistently applied and which are not excluded by the contract.
- (5) Enforcement. A subcontractor or supplier which is determined by the Commissioner to have frustrated the intent of the provisions regarding progress payments for major equipment or specifically manufactured equipment through intentional forfeiture of its bond or failure to deliver the equipment may be determined nonresponsible and ineligible for further work under State funded projects.
 - (6) Contract provisions. Where applicable, appropriate provisions regarding progress payments must be included in each contract and subcontract.
 - (7) Implementation. The foregoing progress payments policy should be implemented in invitations for bids for project funded by the Clean Water Fund. If provision for progress payments is made after contract award, it must be for consideration that the municipality deems adequate.

Sec. 22a-482-4 (n) Retention from Progress Payments

- (1) The municipality may retain a portion of the amount otherwise due the contractor. The amount the municipality retains shall be limited to the following:
 - (A) Withholding of not more than 5 percent of the payment claimed until work is 50 percent complete;
 - (B) When work is 50 percent complete, reduction of the withholding to 2 percent of the dollar value of all work satisfactorily completed to date, provided that the contractor is making satisfactory progress and there is no specific cause for greater withholding;
 - (C) When the work is substantially complete (operational or beneficial occupancy), the withheld amount shall be further reduced below 2 percent to only that amount necessary to assure completion;
 - (D) The municipality may reinstate up to 5 percent withholding if the municipality determines, at its discretion, that the contractor is not making satisfactory progress or there is other specific cause for such withholding; and

- (E) The municipality may accept securities negotiable without recourse, condition or restrictions, a release of retainage bond, or an irrevocable letter of credit provided by the contractor instead of all or part of the cash retainage.
- (2) The foregoing retention policy shall be implemented with respect to all construction projects . Appropriate provision to assure compliance with this policy must be included in the bid documents for such projects initially or by addendum before the bid submission date and as a special condition in the funding agreement or in an amendment which is issued by the Commissioner.
- (3) A municipality which delays disbursement to contractors of funds will be required to credit to the Clean Water Fund all interest earned on those funds and will be responsible for any and all tax law violations which occur as a result of their actions.

Sec. 22a-482-4 (o) Protests

- (1) General. A protest based upon an alleged violation of the procurement requirements may be filed against a municipality's procurement action by a party with an adversely affected direct financial interest. Any such protest must be received by the municipality within the time period in (2)(A) of this section. The municipality is responsible for resolution of the protest before taking the protested action, in accordance with (4) of this section, except as otherwise provided by (9) of this section or 22a-482-4(j)(2)(H)(v).
- (2) Time limitations.
 - (A) A protest under (4) of this section should be made as early as possible during the procurement process to avoid disruption of or unnecessary delay to the procurement process. A protest authorized by (4) of this section must be received by the municipality within one week after the basis for the protest is known or should have been known, whichever is earlier.
 - (i) In the case of an alleged violation of the specification requirements of Section 22a-482-4(h)(12), relating to specifications (e.g., that a product fails to qualify as an "or equal") a protest need not be filed prior to the opening of bids. The municipality may resolve the issue before receipt of bids or proposals through a written or other formal determination, after notice and opportunity to comment is afforded to any party with a direct financial interest.
 - (ii) When an alleged violation of the specification requirements of Section 22a-482-4(h)(12) first arises subsequent to the receipt of bids or proposals, the municipality must decide the protest if the protest was received by the municipality within one week of the time that the municipality's written or other formal notice is first received.
 - (B) A protest appeal authorized by this section must be filed in a court of competent jurisdiction within the locality of the municipality within one week after the complainant has received the municipality's determination.
 - (C) If a protest is mailed, the complaining party bears the risk of nondelivery within the required time period. All documents transmitted in accordance with this section

shall be mailed by certified mail (return receipt requested) or otherwise delivered in a manner which will objectively establish the date of receipt. Initiation of protest actions under (4) or (5) of this section may be made by brief telegraphic notice accompanied by prompt mailing or other delivery of a more detailed statement of the basis for the protest. Telephone protests will not be considered.

(3) Other initial requirements.

- (A) The initial protest document must briefly state the basis for the protest and should:
 - (i) Refer to the specific portions of these regulations which allegedly prohibit the procurement action;
 - (ii) Specifically request a determination pursuant to this section;
 - (iii) Identify the specific procurement document(s) or portion(s) of them in issue; and
 - (iv) Include the name, telephone number, and address of the person representing the protesting party.
- (B) The party filing the protest must concurrently transmit a copy of the initial protest document and any attached documentation to all other parties with a direct financial interest which may be adversely affected by the determination of the protest (all bidders or proposers who appear to have a substantial and reasonable prospect of receiving an award if the protest is denied or sustained) and to the Commissioner.

(4) Municipality determination.

- (A) The municipality is responsible for the initial resolution of protests based upon alleged violations of the procurement requirements.
- (B) When the municipality receives a timely written protest, it must defer the protested procurement action in accordance with (7) of this section and:
 - (i) Afford the complaining party and interested parties an opportunity to present arguments in support of their views in writing or at a conference or other suitable meeting (such as a city council meeting);
 - (ii) Inform the complainant and other interested parties of the procedures which the municipality will observe for resolution of the protest;
 - (iii) Obtain an appropriate extension of the period for acceptance of the bid and bid bond(s) of each interested party, where applicable (failure to agree to a suitable extension of such bid and bid bond(s) by the party which initiated the protest shall be cause for summary dismissal of the protest by the municipality or the Commissioner); and

- (iv) Promptly deliver (by certified mail, return receipt requested, or by personal delivery) its written determination of the protest to the complaining party and to each other participating party.
 - (C) The municipality's determination must be accompanied by a legal opinion addressing issues arising under State, or local law, if any and, when construction is involved, by an engineering report, if appropriate.
 - (D) The municipality should decide the protest as promptly as possible – generally within 3 weeks after receipt of a protest, unless extenuating circumstances require a longer period of time for proper resolution of the protest.
- (5) Procedures.
- (A) Where resolution of an issue properly raised with respect to a procurement requirement necessitates prior or collateral resolution of a legal issue arising under State or local law, and such law is not clearly established in published legal decisions of the State or other relevant jurisdiction, the municipality may rely upon:
 - (i) An opinion of the municipality's legal counsel adequately addressing the issue;
 - (ii) The established or consistent practice of the municipality, to the extent appropriate;
 - (iii) The law of other local jurisdictions as established in published legal decisions; or
 - (iv) If none of the foregoing adequately resolve the issue, published decisions of the Comptroller General of the United States (U.S. General Accounting Office) or of the Federal or State courts addressing Federal or State requirements comparable to procurement requirements of this section.
 - (B) A party who submits a document subsequent to initiation of a protest proceeding must simultaneously furnish each of the other parties with a copy of such document.
 - (C) The procedures established herein are not intended to preclude informal resolution or voluntary withdrawal of protests. A complainant may withdraw its appeal at any time, and the protest proceedings shall thereupon be terminated.
 - (D) A protest may be dismissed for failure to comply with procedural requirements set forth in this section.
- (6) Burden of proof.
- (A) In protest proceedings, if the municipality proposes to award a formally advertised, competitively bid, fixed price contract to a party who has submitted the apparent lowest price, the party initiating the protest will bear the burden of proof.
 - (B) In protest proceedings:

- (i) If the municipality proposes to award a formally advertised, competitively bid, fixed price contract to a bidder other than the bidder which submitted the apparent lowest price, the municipality will bear the burden of proving that its determination concerning responsiveness is in accordance with these regulations; and
 - (ii) If the basis for the municipality's determination is a finding of nonresponsibility, the municipality must establish and substantiate the basis for its determination and must adequately establish that such determination has been made in good faith.
- (7) Deferral of procurement action. Upon receipt of a protest, the municipality must defer the protested procurement action (for example, defer the issuance of solicitations, contract award, or issuance of notice to proceed under a contract) until ten days after delivery of its determination to the participating parties. The municipality may receive or open bids at its own risk, if it considers this to be in its best interest. When the Commissioner has received a written protest, he or she must notify the municipality promptly to defer its protested procurement action until notified of the formal or informal resolution of the protest.
- (8) Enforcement. Noncompliance with the procurement provisions by the municipality shall be cause for enforcement action in accordance with one or more of the provisions of Section 22a-482-4(f)(23).
- (9) Limitation. A protest may not be filed with respect to the following:
 - (A) Issues not arising under the procurement provisions;
 - (B) Issues relating to the selection of a consulting engineer, provided that a protest may be filed only with respect to the mandatory procedural requirements of Section 22a-482-4(i);
 - (C) Issues primarily determined by local law or ordinance and as to which the Commissioner, upon review, determines that there is no contravening state requirement and that the municipality's action has a rational basis;
 - (D) Provisions of State regulations applicable to direct State contracts unless such provisions are explicitly referred to or incorporated in these regulations;
 - (E) Basic project design determinations; or
 - (F) Award of subcontracts or issuance of purchase orders under formally advertised, competitively bid, lump sum construction contracts. However, protest may be made to alleged violations of the following:
 - (i) Specification requirements of Section 22a-482-4(h)(12); or
 - (ii) Provisions applicable to the procurement procedures, negotiation or award of subcontracts or issuance of purchase orders under Section 22a-482-4(l).

ATTACHMENT C

**Clean Water Fund Memorandum
American Iron and Steel**

Memorandum

To: All Connecticut Municipalities, Water Pollution Control Facilities, and Consultants

Date: May 28, 2015

Re: Revised American Iron and Steel Memorandum

The Department of Energy and Environmental Protection's (DEEP) Municipal Water Pollution Control Section has updated the American Iron and Steel (AIS) memorandum that was distributed on May 19, 2014.

On June 10, 2014, the Water Resources Reform and Development Act of 2014 (WRRDA) was signed into law by President Obama, which amended the Federal Water Pollution Control Act (FWPCA). The FWPCA section 608 extended the AIS provision that was originally scheduled to expire on September 30, 2014.

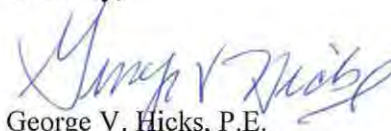
This means that AIS is now a **permanent** project requirement for all Connecticut Clean Water Fund (CWF) projects.

The effective date for the newly codified AIS provision is the date of enactment of the WRRDA, or June 10, 2014.

A recent Environmental Protection Agency (EPA) memorandum dated September 18, 2014 indicates that EPA intends to interpret the WRRDA language for the AIS requirement in the same manner as described in an earlier EPA guidance memo dated March 20, 2014. Therefore, the March 20, 2014 EPA memorandum shall still serve as the final EPA AIS guidance on how to apply the AIS requirement, and it is attached to the revised CWF memo.

The final memorandum is now available on our website at <http://www.ct.gov/dep/cwp>.

Sincerely,



George V. Hicks, P.E.
Supervising Sanitary Engineer
Bureau of Water Protection & Land Reuse

Revised Clean Water Fund Memorandum (2014-001a)

TO: All Connecticut Municipalities and Consultants

RE: Implementation of American Iron and Steel provisions on Connecticut Clean Water Fund Projects

I. PURPOSE

To provide clarification on the applicability of American Iron and Steel (AIS) provisions to construction projects funded by the Connecticut Clean Water Fund (CWF).

II. GOVERNING FEDERAL PUBLIC LAW

Section 436 of Public Law (P.L.) 113-76, Consolidated Appropriations Act, 2014.

III. APPLICABILITY

All Connecticut CWF projects must use “iron and steel products” (Section III.A) that are “produced in the United States” for construction projects. The final Environmental Protection Agency (EPA) AIS guidance memorandum dated March 20, 2014 (“final EPA AIS guidance”) on how to apply the AIS requirement is attached.

This memorandum summarizes the final EPA AIS guidance, and describes how it relates specifically to Connecticut CWF projects. Section III.C details what is required for a CWF project that is subject to the AIS provisions. Any definitions provided by the final EPA AIS guidance are included in Section IV.

Section 436 of P.L. 113-76 excludes products (Section III.B) to the AIS requirement, as well as a waiver request process to exclude products or the entire project from AIS requirements (Section III.D).

A. Applicable Iron and Steel Products

1. The AIS requirement applies to all of the following products:
 - a. Lined or unlined pipes and fittings;
 - b. Manholes covers and other “municipal castings”;
 - c. Hydrants;
 - d. Tanks;
 - e. Flanges;
 - f. Pipe clamps and restraints;
 - g. Valves;
 - h. “Structural steel”;
 - i. Reinforced precast concrete; or
 - j. “Construction materials”.

Refer to Section IV for further clarification of items b, h, and j.

2. Each project item listed in Section III.A.1 and is considered to be “primarily iron or steel”, or comprised of greater than 50% iron or “steel” as measured by cost, becomes subject to the AIS requirement.
 - a. The cost used to determine AIS applicability shall be based on the material costs, and shall include the cost to pour and cast iron and/or steel components.
 - b. The cost used to determine AIS applicability shall not include assembly cost.
3. Unlike the products listed in Section III.A.1.a – h and j, all reinforced precast concrete used in applicable products is subject to the AIS requirement, no matter how much iron or steel comprises the reinforced precast concrete. The reinforcing bar and wire must be produced in the US and meet the same standards as for any other iron or steel product. The casting of the concrete product must take place in the US. The cement and other raw materials used in concrete production are not required to be of domestic origin.
4. “Construction materials” are any products that become permanently incorporated into the project, even if those products may be considered temporary in most instances. For example, any iron or steel sheeting or piles that are not removed after construction is completed are considered to be “construction materials” subject to the AIS requirement.

B. Excluded Products

1. The AIS requirement does not apply to any mechanical and/or electrical components, equipment and systems. Mechanical and electrical components, equipment and systems are not considered construction materials.
2. The following examples (including their appurtenances necessary for their intended use and operation) are NOT considered construction materials, and are therefore NOT subject to the AIS requirement:
 - a. Pumps;
 - b. Motors;
 - c. Gear reducers;
 - d. Drives (including variable frequency drives (VFDs));
 - e. Electric/pneumatic/manual accessories used to operate valves (such as electric valve actuators);
 - f. Mixers;
 - g. Gates;
 - h. Motorized screens (such as traveling screens);
 - i. Blowers/aeration equipment;
 - j. Compressors;
 - k. Meters, sensors, controls and switches;
 - l. Supervisory control and data acquisition (SCADA);
 - m. Membrane bioreactor systems;
 - n. Membrane filtration systems;
 - o. Filters, clarifiers and clarifier mechanisms;
 - p. Rakes, grinders;
 - q. Disinfection systems;
 - r. Presses (including belt presses);
 - s. Conveyors, cranes;
 - t. HVAC (excluding ductwork), water heaters, heat exchangers;
 - u. Generators;

- v. Cabinetry and housings (such as electrical boxes/enclosures);
 - w. Lighting fixtures;
 - x. Electrical conduit;
 - y. Emergency life systems;
 - z. Metal office furniture, shelving;
 - aa. Laboratory equipment, analytical instrumentation; and
 - bb. Dewatering equipment.
3. Raw materials such as iron ore, limestone, and iron/steel scrap are not covered by the AIS requirement. If any raw materials are being applied as a coating, the raw materials are similarly not covered.

C. AIS Requirements

1. For each item that meets the criteria indicated in Sections III.A, the iron and steel products contained in that item must be "produced in the United States (US)".
 - a. All manufacturing processes must take place in the US, with the exception of metallurgical processes involving the refinement of steel additives.
 - b. Manufacturing processes covered by the AIS requirement include: melting, refining, forming, rolling, drawing, refining, finishing, fabricating, coating.
 - c. In the case of reinforced precast concrete, the casting of the concrete must also occur in the US. The cement and other raw materials used in the concrete production may come from non-US sources.
 - d. Each domestic iron and steel product must remain in the US for the entire manufacturing process; otherwise, it will be considered foreign source material.
 - e. Non-iron or steel components of an iron and steel product may come from non-US sources.
2. The construction contract language contained in **Appendix 4 of the attached final EPA AIS guidance** must be included in the CWF contract documents in order to obtain CWF approval of the engineering plans and specifications.
3. Certification for AIS compliance
 - a. Certification must be provided for all items in Section III.A.
 - b. Types of Certification
 - i. Step certification process: Each handler (supplier, fabricator, manufacturer, processor, etc) of the iron and steel products certifies that their step in the process was domestically performed.
 - ii. Final manufacturer certification: Alternatively, the final manufacturer that delivers the iron or steel product to the worksite, vendor, or contractor, may provide a certification asserting that all manufacturing processes occurred in the US.
 - c. AIS compliance certification must be provided on company letterhead, in the format provided by **Appendix 5 of the attached final EPA AIS guidance**.
 - d. These certifications shall be collected and maintained by the municipality, and must be available upon request by either the EPA or the DEEP.

D. Waiver Request Process

1. A waiver from the AIS requirement may be requested for a CWF project if at least one of the following conditions is sufficiently demonstrated:
 - a. The AIS requirement will increase the cost of the overall project by more than 25 percent, as demonstrated by the inclusion of a bid alternate and backup calculations;

- b. The iron and steel products are not produced in the United States in sufficient and “reasonably available quantities” and of “satisfactory quality”, as demonstrated by soliciting proposals from at least three manufacturers; or
 - c. The AIS requirement is inconsistent with the public interest.
- 2. Waiver Request Format
 - a. The waiver request must include a table with responses to the “Information Checklist for Waiver Request” in **Appendix 1 of the attached final EPA AIS guidance**.
 - b. Evaluation of the waiver request shall include the criteria in the “HQ Review Checklist for Waiver Request” in **Appendix 2 of the attached final EPA AIS guidance**.
 - c. Waiver requests shall be submitted to the Connecticut Department of Energy and Environmental Protection (DEEP) for initial screening.
 - d. If the DEEP determines that a waiver to the AIS requirement has been sufficiently demonstrated, the DEEP will forward the waiver request to the EPA.
- 3. Final Waiver Determination
 - a. The waiver request shall be made available on the EPA website and the DEEP CWF webpage.
 - b. The EPA shall allow for informal public input for at least 15 days prior to making a determination.

IV. DEFINITIONS

AIS: American Iron and Steel

Assistant recipients: A borrower or grantee that receives funding from a State CWSRF program. In the case of Connecticut CWF projects, “assistance recipients” are the municipalities, as defined below.

CGS: Connecticut General Statutes

Construction materials: Construction materials are those articles, materials, or supplies made primarily of iron and steel, that are permanently incorporated into the applicable project, not including mechanical and/or electrical components, equipment and systems.

Some construction materials may overlap with what is also considered “structural steel”. This includes, but is not limited to, the following products: wire rod, bar, angles, concrete reinforcing bar, wire, wire cloth, wire rope and cables, tubing, framing, joists, trusses, fasteners (i.e., nuts and bolts), welding rods, decking, grating, railings, stairs, access ramps, fire escapes, ladders, wall panels, dome structures, roofing, ductwork, surface drains, cable hanging systems, manhole steps, fencing and fence tubing, guardrails, doors, and stationary screens.

CWF: Connecticut Clean Water Fund

CWSRF: Clean Water State Revolving Fund

DEEP: Connecticut Department of Energy and Environmental Protection

Electrical equipment: Electrical equipment is typically any machine powered by electricity and includes components that are part of the electrical distribution system.

EPA: Federal Environmental Protection Agency

FWPCA: Federal Water Pollution Control Act

Final EPA AIS Guidance: This refers to the attached EPA Memorandum entitled “Implementation of American Iron and Steel provisions of P.L. 113-76, Consolidated Appropriations Act, 2014” dated March 20, 2014.

HVAC: Heating, ventilation, and air conditioning

Municipality: Any “municipality” eligible for the CWF, as defined in Section 22a-475 of the CGS. The municipalities are the “assistance recipients” for the purposes of the AIS requirement.

Iron and Steel Products: The term “iron and steel products” means the following products are made of “primarily iron or steel”: lined or unlined pipes and fittings, manholes covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, and construction materials.

Mechanical equipment: Mechanical equipment is typically that which has motorized parts and/or is powered by a motor.

Municipal castings: Municipal castings are cast iron or steel infrastructure products that are melted and cast. They typically provide access, protection, or housing for components incorporated into utility owned drinking water, storm water, wastewater, and surface infrastructure. They are typically made of grey or ductile iron, or steel. Examples of municipal castings are:

- Access Hatches;
- Ballast Screen;
- Benches (Iron or Steel);
- Bollards;
- Cast Bases;
- Cast Iron Hinged Hatches, Square and Rectangular;
- Cast Iron Riser Rings;
- Catch Basin Inlet;
- Cleanout/Monument Boxes;
- Construction Covers and Frames;
- Curb and Corner Guards;
- Curb Openings;
- Detectable Warning Plates;
- Downspout Shoes (Boot, Inlet);
- Drainage Grates, Frames and Curb Inlets;
- Inlets;
- Junction Boxes;
- Lampposts;
- Manhole Covers, Rings and Frames, Risers;
- Meter Boxes;
- Service Boxes;
- Steel Hinged Hatches, Square and Rectangular;
- Steel Riser Rings;

- Trash receptacles;
- Tree Grates;
- Tree Guards;
- Trench Grates; and
- Valve Boxes, Covers and Risers.

Primarily Iron or Steel: To be considered “primarily iron or steel”, the product must be made of greater than 50% iron or steel, measured by cost. The cost should be based on the material costs.

P.L.: Public Law

Production in the US: For the purposes of the AIS requirement, “production in the US” of the iron or steel used in an applicable product requires that all manufacturing processes must take place in the US, except metallurgical processes involving refinement of steel additives.

Reasonably Available Quantity: The quantity of iron or steel products is available or will be available at the time needed and place needed, and in the proper form or specification as specified in the project plans and design.

Satisfactory Quality: The quality of iron or steel products, as specified in the project plans and designs.

SCADA: Supervisory control and data acquisition

Steel: An alloy that includes at least 50 percent iron, between 0.02 and 2 percent carbon, and may include other elements. Metallic elements such as chromium, nickel, molybdenum, manganese, and silicon may be added during the melting of steel for the purpose of enhancing properties such as corrosion resistance, hardness, or strength. The definition of steel includes carbon steel, alloy steel, stainless steel, tool steel, and other specialty steels.

Step Certification: A step certification is a process under which each handler (supplier, fabricator, manufacturer, processor, etc.) of the iron and steel products certifies that their step in the process was domestically performed.

Structural steel: Structural steel is rolled flanged shapes, having at least one dimension of their cross-section three inches or greater, which are used in the construction of bridges, buildings, ships, railroad rolling stock, and for numerous other constructional purposes. Such shapes are designated as wide-flange shapes, standard I-beams, channels, angles, tees and zeos. Other shapes include H-piles, sheet piling, tie plates, cross ties, and those for other special purposes. Some structural steel may overlap with what is also considered “construction materials” (see definition above).

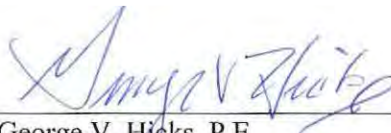
RCSA: Regulations of the Connecticut State Agencies

US: United States

VFDs: Variable frequency drives

WRRDA: Water Resources Reform and Development Act of 2014

5/28/2015
Date


George V. Hicks, P.E.
Supervising Sanitary Engineer
Bureau of Water Protection & Land Reuse

Attachment: EPA Memorandum: "Implementation of American Iron and Steel provisions of P.L. 113-76, Consolidated Appropriations Act, 2014" dated March 20, 2014.



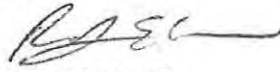
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

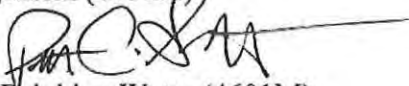
MAR 20 2014

OFFICE OF WATER

MEMORANDUM

SUBJECT: Implementation of American Iron and Steel provisions of P.L. 113-76,
Consolidated Appropriations Act, 2014

FROM: For Andrew D. Sawyers, Director 
Office of Wastewater Management (4201M)

Peter C. Grevatt, Director 
Office of Ground Water and Drinking Water (4601M)

TO: Water Management Division Directors
Regions I - X

P.L. 113-76, Consolidated Appropriations Act, 2014 (Act), includes an "American Iron and Steel (AIS)" requirement in section 436 that requires Clean Water State Revolving Loan Fund (CWSRF) and Drinking Water State Revolving Loan Fund (DWSRF) assistance recipients to use iron and steel products that are produced in the United States for projects for the construction, alteration, maintenance, or repair of a public water system or treatment works if the project is funded through an assistance agreement executed beginning January 17, 2014 (enactment of the Act), through the end of Federal Fiscal Year 2014.

Section 436 also sets forth certain circumstances under which EPA may waive the AIS requirement. Furthermore, the Act specifically exempts projects where engineering plans and specifications were approved by a State agency prior to January 17, 2014.

The approach described below explains how EPA will implement the AIS requirement. The first section is in the form of questions and answers that address the types of projects that must comply with the AIS requirement, the types of products covered by the AIS requirement, and compliance. The second section is a step-by-step process for requesting waivers and the circumstances under which waivers may be granted.

Implementation

The Act states:

Sec. 436. (a)(1) None of the funds made available by a State water pollution control revolving fund as authorized by title VI of the Federal Water Pollution Control Act (33 U.S.C. 1381 et seq.) or made available by a drinking water treatment revolving loan fund as authorized by section 1452 of the Safe Drinking Water Act (42 U.S.C. 300j-12) shall be used for a project for the construction, alteration, maintenance, or repair of a public water system or treatment works unless all of the iron and steel products used in the project are produced in the United States.

(2) In this section, the term “iron and steel products” means the following products made primarily of iron or steel: lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, and construction materials.

(b) Subsection (a) shall not apply in any case or category of cases in which the Administrator of the Environmental Protection Agency (in this section referred to as the “Administrator”) finds that—

(1) applying subsection (a) would be inconsistent with the public interest;

(2) iron and steel products are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quality; or

(3) inclusion of iron and steel products produced in the United States will increase the cost of the overall project by more than 25 percent.

(c) If the Administrator receives a request for a waiver under this section, the Administrator shall make available to the public on an informal basis a copy of the request and information available to the Administrator concerning the request, and shall allow for informal public input on the request for at least 15 days prior to making a finding based on the request. The Administrator shall make the request and accompanying information available by electronic means, including on the official public Internet Web site of the Environmental Protection Agency.

(d) This section shall be applied in a manner consistent with United States obligations under international agreements.

(e) The Administrator may retain up to 0.25 percent of the funds appropriated in this Act for the Clean and Drinking Water State Revolving Funds for carrying out

the provisions described in subsection (a)(1) for management and oversight of the requirements of this section.

(f) This section does not apply with respect to a project if a State agency approves the engineering plans and specifications for the project, in that agency's capacity to approve such plans and specifications prior to a project requesting bids, prior to the date of the enactment of this Act.

The following questions and answers provide guidance for implementing and complying with the AIS requirements:

Project Coverage

1) What classes of projects are covered by the AIS requirement?

All treatment works projects funded by a CWSRF assistance agreement, and all public water system projects funded by a DWSRF assistance agreement, from the date of enactment through the end of Federal Fiscal Year 2014, are covered. The AIS requirements apply to the entirety of the project, no matter when construction begins or ends. Additionally, the AIS requirements apply to all parts of the project, no matter the source of funding.

2) Does the AIS requirement apply to nonpoint source projects or national estuary projects?

No. Congress did not include an AIS requirement for nonpoint source and national estuary projects unless the project can also be classified as a 'treatment works' as defined by section 212 of the Clean Water Act.

3) Are any projects for the construction, alteration, maintenance, or repair of a public water system or treatment works excluded from the AIS requirement?

Any project, whether a treatment works project or a public water system project, for which engineering plans and specifications were approved by the responsible state agency prior to January 17, 2014, is excluded from the AIS requirements.

4) What if the project does not have approved engineering plans and specifications but has signed an assistance agreement with a CWSRF or DWSRF program prior to January 17, 2014?

The AIS requirements do not apply to any project for which an assistance agreement was signed prior to January 17, 2014.

5) What if the project does not have approved engineering plans and specifications, but bids were advertised prior to January 17, 2014 and an assistance agreement was signed after January 17, 2014?

If the project does not require approved engineering plans and specifications, the bid advertisement date will count in lieu of the approval date for purposes of the exemption in section 436(f).

6) What if the assistance agreement that was signed prior to January 17, 2014, only funded a part of the overall project, where the remainder of the project will be funded later with another SRF loan?

If the original assistance agreement funded any construction of the project, the date of the original assistance agreement counts for purposes of the exemption. If the original assistance agreement was only for planning and design, the date of that assistance agreement will count for purposes of the exemption only if there is a written commitment or expectation on the part of the assistance recipient to fund the remainder of the project with SRF funds.

7) What if the assistance agreement that was signed prior to January 17, 2014, funded the first phase of a multi-phase project, where the remaining phases will be funded by SRF assistance in the future?

In such a case, the phases of the project will be considered a single project if all construction necessary to complete the building or work, regardless of the number of contracts or assistance agreements involved, are closely related in purpose, time and place. However, there are many situations in which major construction activities are clearly undertaken in phases that are distinct in purpose, time, or place. In the case of distinct phases, projects with engineering plans and specifications approval or assistance agreements signed prior to January 17, 2014 would be excluded from AIS requirements while those approved/signed on January 17, 2014, or later would be covered by the AIS requirements.

8) What if a project has split funding from a non-SRF source?

Many States intend to fund projects with “split” funding, from the SRF program and from State or other programs. Based on the Act language in section 436, which requires that American iron and steel products be used in any project for the construction, alteration, maintenance, or repair of a public water system or treatment works receiving SRF funding between and including January 17, 2014 and September 30, 2014, any project that is funded in whole or in part with such funds must comply with the AIS requirement. A “project” consists of all construction necessary to complete the building or work regardless of the number of contracts or assistance agreements involved so long as all contracts and assistance agreements awarded are closely related in purpose, time and place. This precludes the intentional splitting of SRF projects into separate and smaller contracts or assistance agreements to avoid AIS coverage on some portion of a larger

project, particularly where the activities are integrally and proximately related to the whole. However, there are many situations in which major construction activities are clearly undertaken in separate phases that are distinct in purpose, time, or place, in which case, separate contracts or assistance agreement for SRF and State or other funding would carry separate requirements.

9) What about refinancing?

If a project began construction, financed from a non-SRF source, prior to January 17, 2014, but is refinanced through an SRF assistance agreement executed on or after January 17, 2014 and prior to October 1, 2014, AIS requirements will apply to all construction that occurs on or after January 17, 2014, through completion of construction, unless, as is likely, engineering plans and specifications were approved by a responsible state agency prior to January 17, 2014. There is no retroactive application of the AIS requirements where a refinancing occurs for a project that has completed construction prior to January 17, 2014.

10) Do the AIS requirements apply to any other EPA programs, besides the SRF program, such as the Tribal Set-aside grants or grants to the Territories and DC?

No, the AIS requirement only applies to funds made available by a State water pollution control revolving fund as authorized by title VI of the Federal Water Pollution Control Act (33 U.S.C. 1381 et seq.) or made available by a drinking water treatment revolving loan fund as authorized by section 1452 of the Safe Drinking Water Act (42 U.S.C. 300j-12)

Covered Iron and Steel Products

11) What is an iron or steel product?

For purposes of the CWSRF and DWSRF projects that must comply with the AIS requirement, an iron or steel product is one of the following made primarily of iron or steel that is permanently incorporated into the public water system or treatment works:

- Lined or unlined pipes or fittings;
- Manhole Covers;
- Municipal Castings (defined in more detail below);
- Hydrants;
- Tanks;
- Flanges;
- Pipe clamps and restraints;
- Valves;
- Structural steel (defined in more detail below);
- Reinforced precast concrete; and
- Construction materials (defined in more detail below).

12) What does the term 'primarily iron or steel' mean?

'Primarily iron or steel' places constraints on the list of products above. For one of the listed products to be considered subject to the AIS requirements, it must be made of greater than 50% iron or steel, measured by cost. The cost should be based on the material costs.

13) Can you provide an example of how to perform a cost determination?

For example, the iron portion of a fire hydrant would likely be the bonnet, body and shoe, and the cost then would include the pouring and casting to create those components. The other material costs would include non-iron and steel internal workings of the fire hydrant (i.e., stem, coupling, valve, seals, etc). However, the assembly of the internal workings into the hydrant body would not be included in this cost calculation. If one of the listed products is not made primarily of iron or steel, United States (US) provenance is not required. An exception to this definition is reinforced precast concrete, which is addressed in a later question.

14) If a product is composed of more than 50% iron or steel, but is not listed in the above list of items, must the item be produced in the US? Alternatively, must the iron or steel in such a product be produced in the US?

The answer to both question is no. Only items on the above list must be produced in the US. Additionally, the iron or steel in a non-listed item can be sourced from outside the US.

15) What is the definition of steel?

Steel means an alloy that includes at least 50 percent iron, between .02 and 2 percent carbon, and may include other elements. Metallic elements such as chromium, nickel, molybdenum, manganese, and silicon may be added during the melting of steel for the purpose of enhancing properties such as corrosion resistance, hardness, or strength. The definition of steel covers carbon steel, alloy steel, stainless steel, tool steel and other specialty steels.

16) What does 'produced in the United States' mean?

Production in the United States of the iron or steel products used in the project requires that all manufacturing processes, including application of coatings, must take place in the United States, with the exception of metallurgical processes involving refinement of steel additives. All manufacturing processes includes processes such as melting, refining, forming, rolling, drawing, finishing, fabricating and coating. Further, if a domestic iron and steel product is taken out of the US for any part of the manufacturing process, it becomes foreign source material. However, raw materials such as iron ore, limestone and iron and steel scrap are not covered by the AIS requirement, and the

material(s), if any, being applied as a coating are similarly not covered. Non-iron or steel components of an iron and steel product may come from non-US sources. For example, for products such as valves and hydrants, the individual non-iron and steel components do not have to be of domestic origin.

17) Are the raw materials used in the production of iron or steel required to come from US sources?

No. Raw materials, such as iron ore, limestone, scrap iron, and scrap steel, can come from non-US sources.

18) If an above listed item is primarily made of iron or steel, but is only at the construction site temporarily, must such an item be produced in the US?

No. Only the above listed products made primarily of iron or steel, permanently incorporated into the project must be produced in the US. For example trench boxes, scaffolding or equipment, which are removed from the project site upon completion of the project, are not required to be made of U.S. Iron or Steel.

19) What is the definition of 'municipal castings'?

Municipal castings are cast iron or steel infrastructure products that are melted and cast. They typically provide access, protection, or housing for components incorporated into utility owned drinking water, storm water, wastewater, and surface infrastructure. They are typically made of grey or ductile iron, or steel. Examples of municipal castings are:

- Access Hatches;
- Ballast Screen;
- Benches (Iron or Steel);
- Bollards;
- Cast Bases;
- Cast Iron Hinged Hatches, Square and Rectangular;
- Cast Iron Riser Rings;
- Catch Basin Inlet;
- Cleanout/Monument Boxes;
- Construction Covers and Frames;
- Curb and Corner Guards;
- Curb Openings;
- Detectable Warning Plates;
- Downspout Shoes (Boot, Inlet);
- Drainage Grates, Frames and Curb Inlets;
- Inlets;
- Junction Boxes;
- Lampposts;
- Manhole Covers, Rings and Frames, Risers;

Meter Boxes;
Service Boxes;
Steel Hinged Hatches, Square and Rectangular;
Steel Riser Rings;
Trash receptacles;
Tree Grates;
Tree Guards;
Trench Grates; and
Valve Boxes, Covers and Risers.

20) What is 'structural steel'?

Structural steel is rolled flanged shapes, having at least one dimension of their cross-section three inches or greater, which are used in the construction of bridges, buildings, ships, railroad rolling stock, and for numerous other constructional purposes. Such shapes are designated as wide-flange shapes, standard I-beams, channels, angles, tees and zeeks. Other shapes include H-piles, sheet piling, tie plates, cross ties, and those for other special purposes.

21) What is a 'construction material' for purposes of the AIS requirement?

Construction materials are those articles, materials, or supplies made primarily of iron and steel, that are permanently incorporated into the project, not including mechanical and/or electrical components, equipment and systems. Some of these products may overlap with what is also considered "structural steel". This includes, but is not limited to, the following products: wire rod, bar, angles, concrete reinforcing bar, wire, wire cloth, wire rope and cables, tubing, framing, joists, trusses, fasteners (i.e., nuts and bolts), welding rods, decking, grating, railings, stairs, access ramps, fire escapes, ladders, wall panels, dome structures, roofing, ductwork, surface drains, cable hanging systems, manhole steps, fencing and fence tubing, guardrails, doors, and stationary screens.

22) What is not considered a 'construction material' for purposes of the AIS requirement?

Mechanical and electrical components, equipment and systems are not considered construction materials. Mechanical equipment is typically that which has motorized parts and/or is powered by a motor. Electrical equipment is typically any machine powered by electricity and includes components that are part of the electrical distribution system.

The following examples (including their appurtenances necessary for their intended use and operation) are NOT considered construction materials: pumps, motors, gear reducers, drives (including variable frequency drives (VFDs)), electric/pneumatic/manual accessories used to operate valves (such as electric valve actuators), mixers, gates, motorized screens (such as traveling screens), blowers/aeration equipment, compressors, meters, sensors, controls and switches, supervisory control and

data acquisition (SCADA), membrane bioreactor systems, membrane filtration systems, filters, clarifiers and clarifier mechanisms, rakes, grinders, disinfection systems, presses (including belt presses), conveyors, cranes, HVAC (excluding ductwork), water heaters, heat exchangers, generators, cabinetry and housings (such as electrical boxes/enclosures), lighting fixtures, electrical conduit, emergency life systems, metal office furniture, shelving, laboratory equipment, analytical instrumentation, and dewatering equipment.

23) If the iron or steel is produced in the US, may other steps in the manufacturing process take place outside of the US, such as assembly?

No. Production in the US of the iron or steel used in a listed product requires that all manufacturing processes must take place in the United States, except metallurgical processes involving refinement of steel additives.

24) What processes must occur in the US to be compliant with the AIS requirement for reinforced precast concrete?

While reinforced precast concrete may not be at least 50% iron or steel, in this particular case, the reinforcing bar and wire must be produced in the US and meet the same standards as for any other iron or steel product. Additionally, the casting of the concrete product must take place in the US. The cement and other raw materials used in concrete production are not required to be of domestic origin.

If the reinforced concrete is cast at the construction site, the reinforcing bar and wire are considered to be a construction material and must be produced in the US.

Compliance

25) How should an assistance recipient document compliance with the AIS requirement?

In order to ensure compliance with the AIS requirement, specific AIS contract language must be included in each contract, starting with the assistance agreement, all the way down to the purchase agreements. Sample language for assistance agreements and contracts can be found in Appendix 3 and 4.

EPA recommends the use of a step certification process, similar to one used by the Federal Highway Administration. The step certification process is a method to ensure that producers adhere to the AIS requirement and assistance recipients can verify that products comply with the AIS requirement. The process also establishes accountability and better enables States to take enforcement actions against violators.

Step certification creates a paper trail which documents the location of the manufacturing process involved with the production of steel and iron materials. A step certification is a process under which each handler (supplier, fabricator, manufacturer,

processor, etc) of the iron and steel products certifies that their step in the process was domestically performed. Each time a step in the manufacturing process takes place, the manufacturer delivers its work along with a certification of its origin. A certification can be quite simple. Typically, it includes the name of the manufacturer, the location of the manufacturing facility where the product or process took place (not its headquarters), a description of the product or item being delivered, and a signature by a manufacturer's responsible party. Attached, as Appendix 5, are sample certifications. These certifications should be collected and maintained by assistance recipients.

Alternatively, the final manufacturer that delivers the iron or steel product to the worksite, vendor, or contractor, may provide a certification asserting that all manufacturing processes occurred in the US. While this type of certification may be acceptable, it may not provide the same degree of assurance. Additional documentation may be needed if the certification is lacking important information. Step certification is the best practice.

26) How should a State ensure assistance recipients are complying with the AIS requirement?

In order to ensure compliance with the AIS requirement, States SRF programs must include specific AIS contract language in the assistance agreement. Sample language for assistance agreements can be found in Appendix 3.

States should also, as a best practice, conduct site visits of projects during construction and review documentation demonstrating proof of compliance which the assistance recipient has gathered.

27) What happens if a State or EPA finds a non-compliant iron and/or steel product permanently incorporated in the project?

If a potentially non-compliant product is identified, the State should notify the assistance recipient of the apparent unauthorized use of the non-domestic component, including a proposed corrective action, and should be given the opportunity to reply. If unauthorized use is confirmed, the State can take one or more of the following actions: request a waiver where appropriate; require the removal of the non-domestic item; or withhold payment for all or part of the project. Only EPA can issue waivers to authorize the use of a non-domestic item. EPA may use remedies available to it under the Clean Water Act, the Safe Drinking Water Act, and 40 CFR part 31 grant regulations, in the event of a violation of a grant term and condition.

It is recommended that the State work collaboratively with EPA to determine the appropriate corrective action, especially in cases where the State is the one who identifies the item in noncompliance or there is a disagreement with the assistance recipient.

If fraud, waste, abuse, or any violation of the law is suspected, the Office of Inspector General (OIG) should be contacted immediately. The OIG can be reached at 1-

888-546-8740 or OIG_Hotline@epa.gov. More information can be found at this website: <http://www.epa.gov/oig/hotline.htm>.

28) How do international trade agreements affect the implementation of the AIS requirements?

The AIS provision applies in a manner consistent with United States obligations under international agreements. Typically, these obligations only apply to direct procurement by the entities that are signatories to such agreements. In general, SRF assistance recipients are not signatories to such agreements, so these agreements have no impact on this AIS provision. In the few instances where such an agreement applies to a municipality, that municipality is under the obligation to determine its applicability and requirements and document the actions taken to comply for the State.

Waiver Process

The statute permits EPA to issue waivers for a case or category of cases where EPA finds (1) that applying these requirements would be inconsistent with the public interest; (2) iron and steel products are not produced in the US in sufficient and reasonably available quantities and of a satisfactory quality; or (3) inclusion of iron and steel products produced in the US will increase the cost of the overall project by more than 25 percent.

In order to implement the AIS requirements, EPA has developed an approach to allow for effective and efficient implementation of the waiver process to allow projects to proceed in a timely manner. The framework described below will allow States, on behalf of the assistance recipients, to apply for waivers of the AIS requirement directly to EPA Headquarters. Only waiver requests received from states will be considered. Pursuant to the Act, EPA has the responsibility to make findings as to the issuance of waivers to the AIS requirements.

Definitions

The following terms are critical to the interpretation and implementation of the AIS requirements and apply to the process described in this memorandum:

Reasonably Available Quantity: The quantity of iron or steel products is available or will be available at the time needed and place needed, and in the proper form or specification as specified in the project plans and design.

Satisfactory Quality: The quality of iron or steel products, as specified in the project plans and designs.

Assistance Recipient: A borrower or grantee that receives funding from a State CWSRF or DWSRF program.

Step-By-Step Waiver Process

Application by Assistance Recipient

Each local entity that receives SRF water infrastructure financial assistance is required by section 436 of the Act to use American made iron and steel products in the construction of its project. However, the recipient may request a waiver. Until a waiver is granted by EPA, the AIS requirement stands, except as noted above with respect to municipalities covered by international agreements.

The waiver process begins with the SRF assistance recipient. In order to fulfill the AIS requirement, the assistance recipient must in good faith design the project (where applicable) and solicit bids for construction with American made iron and steel products. It is essential that the assistance recipient include the AIS terms in any request for proposals or solicitations for bids, and in all contracts (see Appendix 3 for sample construction contract language). The assistance recipient may receive a waiver at any point before, during, or after the bid process, if one or more of three conditions is met:

1. Applying the American Iron and Steel requirements of the Act would be inconsistent with the public interest;
2. Iron and steel products are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quality; or
3. Inclusion of iron and steel products produced in the United States will increase the cost of the overall project by more than 25 percent.

Proper and sufficient documentation must be provided by the assistance recipient. A checklist detailing the types of information required for a waiver to be processed is attached as Appendix 1.

Additionally, it is strongly encouraged that assistance recipients hold pre-bid conferences with potential bidders. A pre-bid conference can help to identify iron and steel products needed to complete the project as described in the plans and specifications that may not be available from domestic sources. It may also identify the need to seek a waiver prior to bid, and can help inform the recipient on compliance options.

In order to apply for a project waiver, the assistance recipient should email the request in the form of a Word document (.doc) to the State SRF program. It is strongly recommended that the State designate a single person for all AIS communications. The State SRF designee will review the application for the waiver and determine whether the necessary information has been included. Once the waiver application is complete, the State designee will forward the application to either of two email addresses. For CWSRF waiver requests, please send the application to: cwsrfwaiver@epa.gov. For DWSRF waiver requests, please send the application to: dwsrfwaiver@epa.gov.

Evaluation by EPA

After receiving an application for waiver of the AIS requirements, EPA Headquarters will publish the request on its website for 15 days and receive informal comment. EPA Headquarters will then use the checklist in Appendix 2 to determine whether the application properly and adequately documents and justifies the statutory basis cited for the waiver – that it is quantitatively and qualitatively sufficient – and to determine whether or not to grant the waiver.

In the event that EPA finds that adequate documentation and justification has been submitted, the Administrator may grant a waiver to the assistance recipient. EPA will notify the State designee that a waiver request has been approved or denied as soon as such a decision has been made. Granting such a waiver is a three-step process:

1. Posting – After receiving an application for a waiver, EPA is required to publish the application and all material submitted with the application on EPA's website for 15 days. During that period, the public will have the opportunity to review the request and provide informal comment to EPA. The website can be found at: http://water.epa.gov/grants_funding/aisrequirement.cfm
2. Evaluation – After receiving an application for waiver of the AIS requirements, EPA Headquarters will use the checklist in Appendix 2 to determine whether the application properly and adequately documents and justifies the statutory basis cited for the waiver – that it is quantitatively and qualitatively sufficient – and to determine whether or not to grant the waiver.
3. Signature of waiver approval by the Administrator or another agency official with delegated authority – As soon as the waiver is signed and dated, EPA will notify the State SRF program, and post the signed waiver on our website. The assistance recipient should keep a copy of the signed waiver in its project files.

Public Interest Waivers

EPA has the authority to issue public interest waivers. Evaluation of a public interest waiver request may be more complicated than that of other waiver requests so they may take more time than other waiver requests for a decision to be made. An example of a public interest waiver that might be issued could be for a community that has standardized on a particular type or manufacturer of a valve because of its performance to meet their specifications. Switching to an alternative valve may require staff to be trained on the new equipment and additional spare parts would need to be purchased and stocked, existing valves may need to be unnecessarily replaced, and portions of the system may need to be redesigned. Therefore, requiring the community to install an alternative valve would be inconsistent with public interest.

EPA also has the authority to issue a public interest waiver that covers categories of products that might apply to all projects.

EPA reserves the right to issue national waivers that may apply to particular classes of assistance recipients, particular classes of projects, or particular categories of iron or steel products. EPA may develop national or (US geographic) regional categorical waivers through the identification of similar circumstances in the detailed justifications presented to EPA in a waiver request or requests. EPA may issue a national waiver based on policy decisions regarding the public's interest or a determination that a particular item is not produced domestically in reasonably available quantities or of a sufficient quality. In such cases, EPA may determine it is necessary to issue a national waiver.

If you have any questions concerning the contents of this memorandum, you may contact us, or have your staff contact Jordan Dorfman, Attorney-Advisor, State Revolving Fund Branch, Municipal Support Division, at dorfman.jordan@epa.gov or (202) 564-0614 or Kiri Anderer, Environmental Engineer, Infrastructure Branch, Drinking Water Protection Division, at anderer.kirsten@epa.gov or (202) 564-3134.

Attachments

Appendix 1: Information Checklist for Waiver Request

The purpose of this checklist is to help ensure that all appropriate and necessary information is submitted to EPA. EPA recommends that States review this checklist carefully and provide all appropriate information to EPA. This checklist is for informational purposes only and does not need to be included as part of a waiver application.

Items	✓	Notes
<p>General</p> <ul style="list-style-type: none"> • Waiver request includes the following information: <ul style="list-style-type: none"> — Description of the foreign and domestic construction materials — Unit of measure — Quantity — Price — Time of delivery or availability — Location of the construction project — Name and address of the proposed supplier — A detailed justification for the use of foreign construction materials • Waiver request was submitted according to the instructions in the memorandum • Assistance recipient made a good faith effort to solicit bids for domestic iron and steel products, as demonstrated by language in requests for proposals, contracts, and communications with the prime contractor 		
<p>Cost Waiver Requests</p> <ul style="list-style-type: none"> • Waiver request includes the following information: <ul style="list-style-type: none"> — Comparison of overall cost of project with domestic iron and steel products to overall cost of project with foreign iron and steel products — Relevant excerpts from the bid documents used by the contractors to complete the comparison — Supporting documentation indicating that the contractor made a reasonable survey of the market, such as a description of the process for identifying suppliers and a list of contacted suppliers 		
<p>Availability Waiver Requests</p> <ul style="list-style-type: none"> • Waiver request includes the following supporting documentation necessary to demonstrate the availability, quantity, and/or quality of the materials for which the waiver is requested: <ul style="list-style-type: none"> — Supplier information or pricing information from a reasonable number of domestic suppliers indicating availability/delivery date for construction materials — Documentation of the assistance recipient's efforts to find available domestic sources, such as a description of the process for identifying suppliers and a list of contacted suppliers. — Project schedule — Relevant excerpts from project plans, specifications, and permits indicating the required quantity and quality of construction materials • Waiver request includes a statement from the prime contractor and/or supplier confirming the non-availability of the domestic construction materials for which the waiver is sought • Has the State received other waiver requests for the materials described in this waiver request, for comparable projects? 		

Appendix 2: HQ Review Checklist for Waiver Request

Instructions: To be completed by EPA. Review all waiver requests using the questions in the checklist, and mark the appropriate box as Yes, No or N/A. Marks that fall inside the shaded boxes may be grounds for denying the waiver. If none of your review markings fall into a shaded box, the waiver is eligible for approval if it indicates that one or more of the following conditions applies to the domestic product for which the waiver is sought:

1. The iron and/or steel products are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quality.
2. The inclusion of iron and/or steel products produced in the United States will increase the cost of the overall project by more than 25 percent.

Review Items	Yes	No	N/A	Comments
Cost Waiver Requests				
• Does the waiver request include the following information?				
— Comparison of overall cost of project with domestic iron and steel products to overall cost of project with foreign iron and steel products				
— Relevant excerpts from the bid documents used by the contractors to complete the comparison				
— A sufficient number of bid documents or pricing information from domestic sources to constitute a reasonable survey of the market				
• Does the Total Domestic Project exceed the Total Foreign Project Cost by more than 25%?				
Availability Waiver Requests				
• Does the waiver request include supporting documentation sufficient to show the availability, quantity, and/or quality of the iron and/or steel product for which the waiver is requested?				
— Supplier information or other documentation indicating availability/delivery date for materials				
— Project schedule				
— Relevant excerpts from project plans, specifications, and permits indicating the required quantity and quality of materials				
• Does supporting documentation provide sufficient evidence that the contractors made a reasonable effort to locate domestic suppliers of materials, such as a description of the process for identifying suppliers and a list of contacted suppliers?				
• Based on the materials delivery/availability date indicated in the supporting documentation, will the materials be unavailable when they are needed according to the project schedule? (By item, list schedule date and domestic delivery quote date or other relevant information)				
• Is EPA aware of any other evidence indicating the non-availability of the materials for which the waiver is requested?				
Examples include:				
— Multiple waiver requests for the materials described in this waiver request, for comparable projects in the same State				
— Multiple waiver requests for the materials described in this waiver request, for comparable projects in other States				
— Correspondence with construction trade associations indicating the non-availability of the materials				
• Are the available domestic materials indicated in the bid documents of inadequate quality compared those required by the project plans, specifications, and/or permits?				

Appendix 3: Example Loan Agreement Language

ALL ASSISTANCE AGREEMENT MUST HAVE A CLAUSE REQUIRING COMPLIANCE WITH THE AIS REQUIREMENT. THIS IS AN EXAMPLE OF WHAT COULD BE INCLUDED IN SRF ASSISTANCE AGREEMENTS. EPA MAKES NO CLAIMS REGARDING THE LEGALITY OF THIS CLAUSE WITH RESPECT TO STATE LAW:

Comply with all federal requirements applicable to the Loan (including those imposed by the 2014 Appropriations Act and related SRF Policy Guidelines) which the Participant understands includes, among other, requirements that all of the iron and steel products used in the Project are to be produced in the United States ("American Iron and Steel Requirement") unless (i) the Participant has requested and obtained a waiver from the Agency pertaining to the Project or (ii) the Finance Authority has otherwise advised the Participant in writing that the American Iron and Steel Requirement is not applicable to the Project.

Comply with all record keeping and reporting requirements under the Clean Water Act/Safe Drinking Water Act, including any reports required by a Federal agency or the Finance Authority such as performance indicators of program deliverables, information on costs and project progress. The Participant understands that (i) each contract and subcontract related to the Project is subject to audit by appropriate federal and state entities and (ii) failure to comply with the Clean Water Act/Safe Drinking Water Act and this Agreement may be a default hereunder that results in a repayment of the Loan in advance of the maturity of the Bonds and/or other remedial actions.

Appendix 4: Sample Construction Contract Language

ALL CONTRACTS MUST HAVE A CLAUSE REQUIRING COMPLIANCE WITH THE AIS REQUIREMENT. THIS IS AN EXAMPLE OF WHAT COULD BE INCLUDED IN ALL CONTRACTS IN PROJECTS THAT USE SRF FUNDS. EPA MAKES NO CLAIMS REGARDING THE LEGALITY OF THIS CLAUSE WITH RESPECT TO STATE OR LOCAL LAW:

The Contractor acknowledges to and for the benefit of the City of _____ (“Purchaser”) and the _____ (the “State”) that it understands the goods and services under this Agreement are being funded with monies made available by the Clean Water State Revolving Fund and/or Drinking Water State Revolving Fund that have statutory requirements commonly known as “American Iron and Steel;” that requires all of the iron and steel products used in the project to be produced in the United States (“American Iron and Steel Requirement”) including iron and steel products provided by the Contractor pursuant to this Agreement. The Contractor hereby represents and warrants to and for the benefit of the Purchaser and the State that (a) the Contractor has reviewed and understands the American Iron and Steel Requirement, (b) all of the iron and steel products used in the project will be and/or have been produced in the United States in a manner that complies with the American Iron and Steel Requirement, unless a waiver of the requirement is approved, and (c) the Contractor will provide any further verified information, certification or assurance of compliance with this paragraph, or information necessary to support a waiver of the American Iron and Steel Requirement, as may be requested by the Purchaser or the State. Notwithstanding any other provision of this Agreement, any failure to comply with this paragraph by the Contractor shall permit the Purchaser or State to recover as damages against the Contractor any loss, expense, or cost (including without limitation attorney’s fees) incurred by the Purchaser or State resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the State or any damages owed to the State by the Purchaser). While the Contractor has no direct contractual privity with the State, as a lender to the Purchaser for the funding of its project, the Purchaser and the Contractor agree that the State is a third-party beneficiary and neither this paragraph (nor any other provision of this Agreement necessary to give this paragraph force or effect) shall be amended or waived without the prior written consent of the State.

Appendix 5: Sample Certifications

The following information is provided as a sample letter of step certification for AIS compliance. Documentation must be provided on company letterhead.

Date

Company Name

Company Address

City, State Zip

Subject: American Iron and Steel Step Certification for Project (XXXXXXXXXX)

I, (company representative), certify that the (melting, bending, coating, galvanizing, cutting, etc.) process for (manufacturing or fabricating) the following products and/or materials shipped or provided for the subject project is in full compliance with the American Iron and Steel requirement as mandated in EPA's State Revolving Fund Programs.

Item, Products and/or Materials:

1. Xxxx
2. Xxxx
3. Xxxx

Such process took place at the following location:

If any of the above compliance statements change while providing material to this project we will immediately notify the prime contractor and the engineer.

Signed by company representative

The following information is provided as a sample letter of certification for AIS compliance. Documentation must be provided on company letterhead.

Date

Company Name

Company Address

City, State Zip

Subject: American Iron and Steel Certification for Project (XXXXXXXXXX)

I, (company representative), certify that the following products and/or materials shipped/provided to the subject project are in full compliance with the American Iron and Steel requirement as mandated in EPA's State Revolving Fund Programs.

Item, Products and/or Materials:

1. Xxxx
2. Xxxx
3. Xxxx

Such process took place at the following location:

If any of the above compliance statements change while providing material to this project we will immediately notify the prime contractor and the engineer.

Signed by company representative

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01330

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Action Submittals
 - 2. Informational Submittals
- B. Submittals shall be made in accordance with the schedule indicated in the technical sections.

1.2 DEFINITIONS

- A. Action Submittals – includes written and graphic information submitted by Seller that requires Engineer's approval.
- B. Informational Submittals – includes information submitted by Seller that does not require Engineer's approval. The Engineer will acknowledge receipt of such documents and provide comments when the submittals lack the detail required by the Contract Documents.

1.3 ACTION SUBMITTALS

- A. Shop Drawings
 - 1. Shop Drawings as defined in the General Conditions, and as specified in individual work sections include, but are not necessarily limited to, custom-prepared data such as fabrication and erection/installation drawings, schedule information, piece part drawings, actual shopwork manufacturing instructions, special wiring diagrams, coordination drawings, individual system or equipment inspection and test reports including performance curves and certification, as applicable to the Work.
 - 2. Shop Drawings shall be of standardized sizes to enable the Buyer to maintain a permanent record of the submissions. Approved standard size drawings shall be
 - a. 24-inches by 36-inches
 - b. 22-inches by 34-inches
 - c. 11-inches by 17-inches
 - d. 8.5-inches by 11-inches
 - 3. Submit Shop Drawings at the proper time so as to prevent delays in delivery of materials. Coordinate submittals for related or interdependent equipment.
 - 4. Advise the Engineer in writing of any deviations from the requirements of the Contract Documents.

5. Check all Shop Drawings regarding measurements, size of members, materials, and details to determine if they conform to the Contract Documents. Shop Drawings found to be inaccurate, not in compliance, or otherwise in error shall be returned to the Seller for correction before submission to the Engineer.
 6. All details on Shop Drawings submitted for approval shall show clearly the relation of the various parts to the main members and lines of the structure, and where correct fabrication of the work depends upon field measurements, such measurements shall be made and noted on the Shop Drawings before being submitted for approval.
 7. Detailed installation drawings (sewers, equipment, piping, electrical conduits and controls, HVAC work, and plumbing, etc.) shall be drawn to scale and fully dimensioned.
 8. No material or equipment shall be purchased or fabricated until the required Shop Drawings have been submitted and approved. Materials and equipment and the work involved in their installation or incorporation into the Work shall then be as shown in and represented by the Shop Drawings.
 9. Until the necessary approval has been given, do not proceed with any portion of the work, the design or details of which are dependent upon the design or details of work, materials, equipment or other features for which approval is required.
 10. If submitted equipment requires modifications to the structures, piping, layout, or other details shown on the Drawings, details of the proposed modifications must also be submitted for approval. If such equipment and modifications are approved, perform all Work necessary to make such modifications at no additional cost to the Owner.
- B. Product Data: Product data as specified in individual Sections, include, but are not necessarily limited to, standard prepared data for manufactured products (catalog data), such as the manufacturer's product specification and installation instructions, availability of colors and patterns, manufacturer's printed statements of compliances and applicability, roughing-in diagrams and templates, catalog cuts, product photographs, standard wiring diagrams, printed performance curves and operational-range diagrams, production or quality control inspection and test reports and certifications, mill reports, product operating and maintenance instructions and recommended spare-parts listing, and printed product warranties, as applicable to the Work.
- C. Samples and color selection charts: Provide sample, when requested by individual Specification to establish conformance with the Specifications, and as necessary to define color, texture and pattern selections available.
- D. Operation and Maintenance Manuals: In accordance with Section 01770.

1.4 INFORMATIONAL SUBMITTALS

- A. Schedule of Submittals
- B. Product Listing and Manufacturers Qualifications

1. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation and reference standards. Specifically identify the products, the anticipated schedule for delivery and storage, and the estimated value thereof for materials for which approval for off-site storage, if allowed, may be requested.

C. Certificates of Compliance

1. General:
 - a. Submit sworn certificates from the manufacturer or material supplier that the materials and fabrications provided under the Specification section conform with the Contract Documents.
 - b. Certificates shall be signed by an officer of the manufacturer's corporation and witnessed by a Notary Public.
2. Welding: Submit in accordance with individual Specification sections.
3. Installer: Prepare written statements on manufacturer's letterhead certifying that installer complies with requirements as specified in individual Specification sections.
4. Material Test: Prepared by qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.
5. Certificates of Successful Testing or Inspection: Submit when testing or inspection is required by Laws and Regulations or governing agency, or when specified in individual Specification sections.
6. Manufacturer's Certificate of Compliance: In accordance with individual Specification sections.
7. American Iron and Steel: Submit certifications regarding all iron or steel products covered by the American Iron and Steel requirement as specified in Section 00800. The final manufacturer that delivers the iron or steel product to the worksite, vendor, or contractor, shall provide a certification that all manufacturing processes occurred in the US. Additional documentation (step certification) may be required if the certification is lacking important information. A sample certification form is attached to this section.

D. Contract Closeout Submittals: In accordance with Section 01770.

E. Seller Design Data

1. Written and graphic information
2. List of assumptions
3. List of performance and design criteria
4. Summary of loads or load diagram
5. Calculations
6. List of applicable codes and regulations

7. Name and version of software
 8. Information requested in individual Specification section
- F. Seller's Instructions: Written or published information that documents manufacturer's recommendations, guidelines, and procedures in accordance with individual Specification sections.
- G. Test and Inspection Reports
1. Submit test and inspection reports as required by individual Specification sections.
 2. Test and inspection reports shall contain signature of person responsible for test or report.
 3. Reports shall include identification of product and Specification, project name, date and time of test, type of test, location, test results, corrective action required if report indicates test is not in compliance with Contract Documents, interpretation of test results, and other information as required in individual Specification sections.
- H. Equipment Data: Submit information on equipment to be used in the performance of the Work as required by individual Specification sections.
- I. Testing and Start-up Data: Prepare and submit testing procedures proposed to perform testing required by individual Specification sections.
- J. Seller Training Plan: At least two weeks prior to scheduling training of Owner's personnel, submit lesson plans for vendor training in accordance with individual Specification section and manufacturer's Operations and Maintenance Manuals.
- K. Submittals stamped by another Professional Engineer: When specified in individual Specification sections, prepare and submit calculations and/or drawings stamped by a Professional Engineer licensed in the State where the work is being performed.
- L. Coordination Drawings: When specified in individual Specification sections, prepare and submit drawings to show how multiple system and interdisciplinary work will be coordinated. Examples are conduit routing diagrams, duct layouts, utility coordination drawings, sprinkler plans etc.

1.5 PROCEDURES

A. Coordination

1. Prepare and submit documentation in advance of fabrication and product manufacture, so that the installation will not be delayed, other related work can be properly coordinated, and there is adequate time for review and resubmission, if required.
2. Provide no less than 30 days for review of submittals from the time received by the Engineer. For submittals of major equipment, that require more than 30 days to review, due to complexity and detail or those requiring review by multiple engineering disciplines,
3. Re-submittals will be subject to same review time.

4. No extension of time will be authorized due to failure to provide approvable submittals sufficiently in advance of the Work.
- B. Review Shop Drawings, product data, and samples prior to submission and verify and determine:
 1. Field measurements
 2. Conformance with the Contract Documents. Advise the Buyer in writing of any deviations from the requirements of the Contract Documents.
 3. Delete or strike out information that is not applicable to the Work.
- C. Upload the electronic submittal files via Procore until such time that the Buyer directs otherwise. Access to Procore will be provided by the Engineer to the Seller until such time that the Buyer directs otherwise. Files must be in .pdf format and be indexed and searchable.
- D. In addition to the electronic submission requirement, submit upon request, three hard copies of each submittal: one for Owner and one for Engineer's construction observer.
- E. Numbering: Submissions shall be accompanied by a transmittal form (attached by the Construction Contractor) referencing the project name and applicable Specification section. A sample form similar to that which the Buyer (Construction Contractor) may request from the Seller is attached. Submittals shall be numbered sequentially, with the applicable Specification section and a hyphen preceding the number. (*e.g.* Submittal number 11330-01) Resubmittals shall bear the same transmittal number with a sequential letter suffix commencing with "A". (*e.g.* Submittal number 11330-01A)
- F. When a P.E. stamp is specified in individual Specification sections, provide a completed P.E. certification form (attached at the end of this section) attached to the Submittal. Items submitted without the completed certification form will be returned by the Engineer for resubmission.
- G. Partial and Incomplete Submittals
 1. Shop Drawings shall be submitted as a complete package by Specification section, unless otherwise reviewed and approved by the Engineer. It is the intent that all information, materials, and samples associated with each Specification section be included as a single submittal for the Engineer's review.
 2. Engineer will return entire submittals if preliminary review deems it incomplete including:
 - a. Missing or incomplete Submittal certification form
 - b. Insufficient number of copies
 - c. Missing content
 3. Partial submittals may be considered, at Engineer's option, only when necessary to expedite the Project.

4. Partial submittals shall be clearly identified as such on the transmittal to identify missing components.
- H. Submittals not required by the Specification will be returned without review or action code.
- I. Resubmission
 1. Make corrections and modifications required by the Engineer and resubmit until approved.
 2. Clearly identify changes made to submittals and indicate other changes that have been made other than those requested by the Engineer.
 3. A maximum of two re-submissions of each shop drawing will be reviewed, checked and commented upon without charge to the Seller (total of 3 submittals). Any additional submissions which are required by the Engineer to fulfill the stipulations of the Contract Documents will be charged to the Seller.
- J. Distribution
 1. Distribute approved Shop Drawings and approved product data to the Project Site and elsewhere as required to communicate the information to Suppliers, Subcontractors, and field personnel.

1.6 ENGINEER'S REVIEW

- A. The Buyer and Engineer will review submittals for design, general methods of construction and detailing. The Buyer and Engineer's review and approval of submittals shall not be construed as a complete check nor does it relieve the Seller from responsibility for any departures or deviations from the requirements of the Contract Documents unless he has, in writing, called the Buyer and Engineer's attention to such deviations at the time of submission.
- B. Action submittals as defined in paragraph 1.2 will be reviewed and returned under one of the following codes:
 1. Approved (Action Code 1) is assigned when there are no notations or comments on the submittal. Equipment or materials may be released for manufacture, provided that it complies with requirements of the Contract Documents.
 2. Approved as Noted (Action Code 2) is assigned when there are notations or comments on the submittal, but the equipment or materials may still be released for manufacture. All notations and comments must be incorporated in the final product. Resubmission is not necessary.
 3. Revise and Resubmit (Action Code 3) is assigned when there are notations and comments requiring a resubmittal of the package. Work cannot proceed until the submittal is revised and resubmitted for review.
 4. Not Approved (Action Code 4) is assigned when the submittal contains non-specified items or does not meet the requirements of the Contract Documents. It may also be assigned when there is a significant amount of missing material

required for the Engineer to perform a complete review. The entire package must be resubmitted, revised to bring the submittal into conformance. It may be necessary to resubmit using a different manufacturer/vendor to meet the requirements of the Contract Documents.

- C. Informational submittals as defined in paragraph 1.2 do not require approval by the Engineer. Such submittals will be returned under one of the following codes:
 - 1. Receipt Acknowledged (Action Code 5) is assigned when the submittal is provided for documentation purposes and is acknowledged as received. Comments may be noted using this action code.
 - 2. Revise and Resubmit (Action Code 6) is assigned when there are notations and comments requiring a resubmittal of the package.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

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P.E. CERTIFICATION FORM

The undersigned hereby certifies that he/she is a professional engineer registered in the State of Connecticut and that he/she has been employed by

_____ to design
(Name of Contractor)

(Insert P.E. Responsibilities)

In accordance with Specification Section _____ for the

(Name of Project)

The undersigned further certifies that he/she has performed the said design in conformance with all applicable local, state and federal codes, rules and regulations; and, that his/her signature and P.E. stamp have been affixed to all calculations and drawings used in, and resulting from, the design.

The undersigned hereby agrees to make all original design drawings and calculations available to the

(Insert Name of Owner)

or Owner's representative within seven days following written request therefor by the Owner.

P.E. Name

Contractor's Name

Signature

Signature

Title

Title

Address

Address

SAMPLE AMERICAN IRON AND STEEL CERTIFICATION

The following information is provided as a sample letter of certification for AIS compliance. Documentation must be provided on company letterhead.

Date

Company Name

Company Address

City, State, Zip

Subject: American Iron and Steel Certification for Project (_____)

I, (company representative), certify that the following products and/or materials shipped/provided to the subject project are in full compliance with the American Iron and Steel requirement as mandated in EPA's state Revolving Fund Programs.

Item, Products and/or Materials:

1. _____
2. _____
3. _____

Such process took place at the following location:

If any of the above compliance statements change while providing material to this project we will immediately notify the prime contractor and the engineer.

Signed by company representative

SECTION 01630**PRODUCT SUBSTITUTION DURING CONSTRUCTION****PART 1 GENERAL****1.1 SUMMARY**

- A. Section Includes
 - 1. Product substitution procedures

1.2 SELLER'S OPTIONS

- A. For materials or equipment (hereinafter products) specified only by performance or reference standard, select product meeting that standard, by any Supplier. To the maximum extent possible, provide products of the same generic kind from a single source.
- B. For products specified by naming several products or manufacturers, select any one of the products or Suppliers named, which fully complies with the Drawings and Specifications. Another “or-equal” product can also be considered by the Engineer if it complies with the provisions of Article 5.04, Section 00700. If a product proposed by the Seller does not qualify as an “or-equal” item, then it can be considered as a proposed substitute item, and the Seller must comply with the requirements of the Buyer regarding Substitutes.
- C. For products specified by naming products or manufacturers and followed by words indicating that no “or-equal” item or substitution is permitted, there is no option and no substitution will be allowed.
- D. Where more than one choice is available as a Seller's option, select product that is compatible with other products already selected or specified.

1.3 SUBSTITUTIONS

- A. If in the Engineer’s sole discretion a product proposed by the Seller does not qualify as an “or-equal” item under the provisions of Article 5.04 of Section 00700, it can be considered a proposed substitute item. Submit information required under Article 5.04 of Section 00700 and Article 1.4 of this Section for proposed substitutes.
- B. The Engineer will consider written requests for substitutions within 30 days after the Notice to Proceed to the general contractor. After this period, requests will be considered only in case of unavailability of product or other conditions beyond control of the Seller.
- C. Submit 5 copies of request for substitutions. Submit a separate request for each proposed substitution. In addition to the submittal requirements outlined in Article 1.4 of this Section include the following in each substitution request:
 - 1. For products or Suppliers:
 - a. Product identification, including Supplier & manufacturer's name and address.

- b. Manufacturer's literature with product description, performance and test data, and reference standards.
 - c. Samples, if appropriate.
 - d. Name and address of similar projects on which product was used, and date of installation.
 - e. Such other data as the Engineer may require to establish that the proposed substitution is equal to the product, Supplier or method specified.
- D. The substitution request shall include written certification and statements that are outlined Article 1.4 of this Section.
- E. A request constitutes a representation that Seller:
 - 1. Has investigated proposed product and determined that it meets or exceeds quality level of specified product.
 - 2. Will provide same or better guarantees, warranties or bonds for proposed substitution as for specified product.
 - 3. Will coordinate installation and make changes to other work by the construction contractor which may be required for the work of the construction contractor to be complete with no additional cost.
 - 4. Waives all claims for additional costs or time extension which may subsequently become apparent.
 - 5. Will reimburse Buyer for review or redesign services associated with re-approval by authorities having jurisdiction.
- F. A proposed substitution will not be accepted if:
 - 1. Acceptance will require changes in the design concept or a substantial revision of the Contract Documents.
 - 2. It will delay completion of the Work.
 - 3. It is intended or implied on a Shop Drawing and is not accompanied by a formal request for substitution from the Contractor.
- G. The Seller is responsible for all costs relating to substitution requests.
- H. Approval of a substitution does not relieve the Seller from the requirement for submission of Shop Drawings as set forth in the Contract Documents.

1.4 BUYERS REQUIREMENT FOR SUBSTITUTES

- A. The following are the Buyers (Construction Contractor) requirements for Substitutions to which the Seller shall comply.
- B. Unless the specification or description of an item of material or equipment required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Construction Contractor may request that Engineer authorize the use of other items of material or equipment under the

circumstances described below. To the extent possible such requests shall be made before commencement of related construction at the Site.

1. Construction Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of material or equipment from anyone other than Construction Contractor.
2. Construction Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Construction Contractor seeks to furnish or use. The application:
 - a. shall certify that the proposed substitute item will:
 - 1) perform adequately the functions and achieve the results called for by the general design,
 - 2) be similar in substance to that specified, and
 - 3) be suited to the same use as that specified.
 - b. will state:
 - 1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times,
 - 2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and
 - 3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.
 - c. will identify:
 - 1) all variations of the proposed substitute item from that specified, and
 - 2) available engineering, sales, maintenance, repair, and replacement services.
 - d. shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.

C. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Construction Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable

substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Construction Contractor in writing of any negative determination.

- D. *Special Guarantee:* Owner may require Construction Contractor to furnish at Construction Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- E. *Reimbursement of Engineer's Cost:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Construction Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Construction Contractor, Construction Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Construction Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.
- F. *Construction Contractor's Expense:* Construction Contractor shall provide all data in support of any proposed substitute at Construction Contractor's expense.
- G. *Effect of Engineer's Determination:* If Engineer approves the substitution request, Construction Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents. Construction Contractor may challenge the scope of reimbursement costs imposed under Paragraph 1.4.E, by timely submittal of a Change Proposal.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

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SECTION 01770

CLOSEOUT PROCEDURES

1.1 SUMMARY

A. Section Includes

1. Documentation required for the transfer of the completed Goods and Special Services to the Buyer

1.2 SUBMITTALS

A. Closeout Submittals

1. Operation and maintenance manuals

1.3 FINAL PAYMENT

- A. Refer to Article 10.06 in 00700, General Conditions, for procedures relating to obtaining Final Payment. Refer to 00520, Agreement, for Contract times.

1.4 PROJECT CLOSEOUT DOCUMENTS

- A. Operation and Maintenance manuals – Submit four paper copies and two CD copies of Operation and Maintenance Manuals for items listed in other sections of these Specifications and for other items when directed by the Engineer. Electronic files provided shall be indexed and searchable. Draft O&M Manuals shall be submitted at least 60 days prior to start-up of the equipment. Respond to any comments from the draft review as part Final O&M Manuals.

1. Manuals shall be in three-ring binders. However, manuals which consist of 20 or fewer pages may be bound using three-hole, plastic, clear-front report covers.
2. Manuals shall include, as a minimum:
 - a. The Operations and Maintenance Manual Certification Form which shall be attached by the Construction Contractor to every copy of each Operations and Maintenance Manual submitted. A sample form similar to that which the Buyer (Construction Contractor) may request from the Seller is attached.
 - b. A comprehensive index broken down into sections and sub-sections.
 - c. Section and sub-section dividers
 - d. Separate divider for each product
 - e. A complete list of the equipment supplied, including serial numbers, ranges, and pertinent data
 - f. Full specifications on each item including catalog cuts, and drawings.
 - g. Detailed service, maintenance and operation instructions for each item supplied

- h. System schematic drawings “as Constructed,” illustrating all components, piping and electrical connections.
- i. Clearly defined special maintenance requirements particular to this system, along with special calibration and test procedures
- j. Operating instructions with a functional description of the entire system, with references to the systems schematic drawings and instructions. For emergency operations, include emergency procedures for equipment malfunctions to permit a short period of continued operation or to shut down the equipment to prevent further damage to the system’s equipment. Include emergency shutdown instructions. Provide guidance on emergency operations of associated utility systems including valve locations and portions of systems controlled.
- k. Complete parts lists with stock numbers and name, address, and telephone number of the local supplier
- l. A complete “As Constructed” set of approved shop drawings
- m. A narrative description for startup, shutdown, and post-shutdown procedures, including the control sequence for each.
- n. Data sheets indicating the tag names (as used on the Drawings), manufacturer, complete model number, complete specifications, and parameter setup sheet with the parameter setup sheets following the manufacturers O&M manual in its entirety
- o. All illustrations, detailed drawings, wiring diagrams, and instructions necessary for installing, operating, and maintaining the equipment, with illustrated parts numbered for identification and all information applying specifically to the equipment furnished and only including instructions that are applicable. All such illustrations shall be incorporated within the printing of the page to form a durable and permanent reference book.
- p. List personnel hazards and equipment or product safety precautions for normal and emergency operating conditions.
- q. List treatment chemicals needed for the process and provide, as a minimum, the CAS number, quality and concentrations required, an MSDS, transfer, unloading, and storage requirements, safety issues associated with storage and handling, delivery method and materials handling equipment needed, and contact name and address for suppliers.
- r. Personnel Training Requirements: Provide information available from the manufacturers to use in training designated personnel to operate and maintain the equipment and systems properly.
- s. Testing Equipment and Special Tool Information: Include information on test equipment required to perform specified tests and on special tools needed for the operation, maintenance, and repair of components.

- t. Final documentation written specifically for this project including standard and modified standard documentation, with modifications to existing hardware or software manuals made on the respective pages or inserted adjacent to the modified pages. All standard documentation furnished shall have all portions that apply clearly indicated, and all portions that do not apply shall be lined out.
- 3. The format of the O&M manual shall meet the following general requirements:
 - a. Complete, comprehensive index
 - b. Section with operating instructions including complete overview of the system
 - c. Section with a complete parts list as described above
 - d. Section that includes all schematic diagrams, wiring diagrams etc. of the “As Constructed System”
 - e. Product information
- B. Final Documentation – Submit the following final documentation:
 - 1. The maintenance documentation shall describe the detailed preventative and corrective procedures required to keep the system in good operating condition. All hardware maintenance manuals shall make reference to appropriate diagnostics, where applicable, and all necessary timing diagrams shall be included. A maintenance manual or a set of manuals shall be furnished for all delivered hardware, including peripherals. The hardware maintenance documentation shall include, as a minimum, the following information:
 - a. Operation information – This information shall include a detailed description of how the equipment operates and a block diagram illustrating each major assembly in the equipment.
 - b. Preventative-maintenance instructions – These instructions shall include all applicable visual examinations, hardware testing and diagnostics routines, and the adjustments necessary for periodic preventative maintenance of the system to minimize corrective maintenance and repair.
 - c. Operator Service Requirements: Include instructions for services to be performed by the operator such as lubrication, adjustment, inspection, and gauge reading recording.
 - d. Corrective-maintenance instructions – These instructions shall include guides for locating malfunctions down to the card-replacement level. These guides shall include adequate details for quickly and efficiently locating the cause of an equipment malfunction and shall state the probable source(s) of trouble, the symptoms, probable cause, and instructions for remedying the malfunction.

- e. Parts information – This information shall include the identification of each replaceable or field-repairable module. All parts shall be identified on a list in a drawing; the identification shall be of a level of detail sufficient for procuring any repairable or replaceable part. Cross-references between the Contractor's part number and manufacturer's part numbers shall be provided. All PC boards shall be identified by; manufacturer and model number, slot number, part name and configuration (if applicable).
 - f. When a PLC based control panel has been provided, provide two sets of documented as built Electronic PLC, PC, and OIT files on CD-ROMs in native machine readable format for all programs and configurations developed under this Contract. This machine readable documentation shall include all documentation files including logic and annotation files. Any changes made during or after factory acceptance test shall be incorporated at no additional cost to the Buyer.
- C. Provide warranties and bonds for items so listed in pertinent other sections of the Project Manual. Include the servicing and technical precautions prescribed by the manufacturers or contract documents to keep warranties in force. Provide all warranties and bonds in a three-ring binder.
 - D. List of service organizations, and principal vendors, including names, addresses, and telephone numbers where they can be reached for emergency service at all times including nights, weekends, and holidays.
 - E. Equipment start-up reports shall be submitted in duplicate to the Engineer for each piece of equipment installed. The report shall include detailed descriptions of the points inspected, tests, and adjustments made, quantitative results obtained and maintenance suggestions. The report shall certify that the equipment (1) has been satisfactorily installed and conforms to the Contract requirements; (2) is in accurate alignment and free from undue stress; (3) has been operated under full load and operates satisfactorily; and (4) nothing in the installation will render the manufacturer's warranty null and void. Equipment start-up reports shall be included in the appropriate equipment O&M manuals.
 - F. The performance testing report and Seller's certifications as in Equipment Specifications (Division 11).
 - G. Provide records of all Owner training/instruction sessions conducted in accordance with paragraph 1.5 of this Section and as required in the project Specifications. The record for each training session shall include reference to the relevant specification section, a summary of the topics covered in the training session, and a sign-in sheet listing all attendees in attendance for the training.
 - H. Provide color charts, legends, instructions, special tools and other requirements specifically requested in sections of the Specification.

1.5 INSTRUCTION OF OWNER'S PERSONNEL

- A. Provide instruction by qualified manufacturers' representatives in the proper operation, maintenance, adjustment and the safety aspects of the equipment and

materials furnished. Specific instruction requirements may be included within the sections of the Specification.

1.6 COMPLETION

- A. The Contract shall be considered complete and final payment made, only when:
1. All provisions of the Contract Documents have been strictly adhered to.
 2. All warranties, Operation and Maintenance Manuals, maintenance instructions, releases, and permits called for in the Contract have been submitted to the Owner and Engineer as applicable.
 3. All monies owed the Buyer for services performed for the Seller by Buyer's forces in connection with the Contract have been paid.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

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O&M MANUAL CERTIFICATION FORM

PROJECT: _____
ENGINEER: _____ ENGINEER'S PROJECT NO.: _____
CONTRACTOR: _____ CONTRACTOR'S PROJECT NO.: _____

TRANSMITTAL NO.: _____ SHOP DRAWING NO.: _____
SPECIFICATION NO.: _____ DRAWING NO.: _____
DESCRIPTION: _____
MANUFACTURER: _____

The above referenced O&M manual has been reviewed by the undersigned and I/we certify that the manual is customized as needed for this project, and contains the following items, where applicable for the materials or equipment provided:

- | | |
|--|---|
| <input type="checkbox"/> 3-ring binder with title on binder and binding edge | <input type="checkbox"/> Complete parts list of equipment supplied |
| <input type="checkbox"/> Electronic CD, when specified | <input type="checkbox"/> Complete specifications/data on each item |
| <input type="checkbox"/> Comprehensive index broken down into sections | <input type="checkbox"/> Detailed maintenance & operations instructions |
| <input type="checkbox"/> Dividers for sections and sub-sections | <input type="checkbox"/> "As constructed" layout & schematic drawings |
| <input type="checkbox"/> Warranties | <input type="checkbox"/> Wiring diagrams |
| <input type="checkbox"/> Troubleshooting information | <input type="checkbox"/> Lubrication & maintenance schedules |
| <input type="checkbox"/> Startup, operation & shutdown procedures | <input type="checkbox"/> Equipment performance curves |
| <input type="checkbox"/> Safety procedures | <input type="checkbox"/> List of spare parts supplied and current cost |
| <input type="checkbox"/> Manufacturer's contact information | <input type="checkbox"/> Parts & service contact information |

SUBMITTED BY: _____ DATE: _____

CONTRACTOR'S STAMP

DIVISION 11 - EQUIPMENT

SECTION 11000
EQUIPMENT - GENERAL

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. General requirements for the equipment and services to be provided under the Sections of Division 11 including, but not limited to, the following:
 - a. Seismic restraint design
 - b. Handling, storing, and installing materials and equipment during the progress of the work
 - c. Coordination with Buyer
 - d. Furnishing and installing anchor bolts, assembly hardware, and foundations
 - e. Providing the services of manufacturers' representatives for start-up, inspection, and testing
 - f. Providing operation and maintenance manuals
 - g. Providing operator training
 - h. Providing lubricants, spare parts, nameplates, special tools, and safety equipment
 - i. Surface preparation and shop prime painting of equipment
 - j. Providing off-site inspection

B. Related Sections

1. Section 01330, Submittals
2. Section 01770, Closeout Procedures

1.2 SUBMITTALS

A. Provide Submittals in accordance with Section 01330.

B. Seismic Restraint Design

1. Submit complete seismic restraint calculations and details stamped by a Professional Engineer registered in the State of Connecticut, experienced in the analysis and design of equipment support and anchorage for process components and systems to the structure including but not limited to all free standing, suspended or wall mounted process equipment installed under Division 11. Calculations shall include anchor bolt type, embedment, concrete compressive strength, and minimum spacing between anchors and minimum distances of anchors from concrete edges.
2. Perform seismic analysis and design in accordance with the governing building code for the location where the work is being performed at the time the building permit is pulled (currently International Building Code 2012 including Connecticut Supplements and ASCE 7-10). Calculate the seismic force (Fp) using the structural design criteria provided by the Buyer after the building permit is pulled. Preliminary design criteria is provided below:

- a. Building Classification – Risk Category III, Waste Water Treatment Facility
- b. Seismic Design Criteria:
 - 1) Seismic Importance Factor (I_e): 1.25
 - 2) Mapped Risk-Targeted Maximum Considered Earthquake (MCE_R) Spectral Response Acceleration Parameters:
 Short Period Response (S_s): 0.177
 1-Second Period Response (S_1): 0.064
 - 3) Site Class: D
 - 4) Design Spectral Acceleration Parameters:
 Short Period Response (S_{DS}): 0.189
 1-Second Period Response (S_{D1}): 0.102
 - 5) Seismic Design Category: B
3. The analysis and design shall be based on actual equipment data (dimensions, weight, center of gravity, etc.) obtained from Seller's equipment submittals that have been Approved or Approved as Noted in accordance with Section 01330.
4. The seismic restraint design shall clearly indicate the attachment points to the supporting structure and all design forces (in X, Y, and Z direction) at the attachment points. The seismic restraint engineer shall coordinate all attachments with the structural engineer of record for the supporting structure, who shall verify the ability of the supporting structure to accept the loads imposed.

1.3 DELIVERY, STORAGE AND HANDLING

- A. Coat all machined surfaces subject to corrosion with an easily removable rust preventive compound prior to shipment.
- B. Ship fabricated assemblies in the largest sections permitted by carrier regulations, properly labeled for field erection.
- C. Deliver equipment in manufacturer's original, unopened and undamaged packages, unless mounted on equipment assembly.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Anchor bolts, nuts, washers, bolt sleeves, and assembly hardware shall be Type 316 stainless steel. Expansion bolts shall be "Thunderstuds", as manufactured by Unifast Industries, Inc., Hauppauge, NY; Redhead "Wedge Anchors" as manufactured by ITT Phillips, Michigan City, ID; Parabolt as manufactured by the Molly Division Emhart Corp., or equal. Epoxy encapsulated bolts shall be Hilti HVA Adhesive Anchors or equal. All expansion bolts and associated hardware are to be stainless steel.
- B. Nameplates - Provide with each piece of equipment a nameplate of non-corrodible metal, fastened in place and permanently inscribed with the manufacturer's name, model or type designation. Provide motor nameplates separately.

- C. Equipment Drive Guards - Provide approved all-metal guards to enclose the drive mechanism for equipment driven by open shafts, belts, chains, or gears. Guards are to be constructed of galvanized sheet steel or galvanized one inch mesh screen (woven wire or expanded metal) set in a frame of galvanized steel members. Secure guards in position by steel braces or straps, which will permit easy removal for servicing the equipment. Equipment guards shall conform with all applicable OSHA requirements.

PART 3 EXECUTION

3.1 PREPARATION

A. Surface Preparation and Shop Prime Painting

- 1. Paint System: Coordinate with Buyer on the selected manufacturer of the paint for the project. Seller's Primer paint must be compatible with the specified and approved field-applied top coats. Surface preparation and shop priming shall be in accordance with Division 11 Sections. Ship chains, sprockets, gears and the like from the factory with a heavy coating of protective grease.

3.2 ERECTION, INSTALLATION, APPLICATION

A. Coordination

- 1. Coordinate mechanical, electrical and instrumentation requirements of the equipment covered by this section with the Buyer and as needed, each of the Buyer's Suppliers and Subcontractors. This includes but is not limited to providing each with copies of preliminary and final submittals for each equipment item that may impact the work of another Supplier or Subcontractor.

B. Anchor Bolts, Inserts and Assembly Hardware

- 1. Anchor bolts and expansion bolts are to be provided by the Seller. Anchor bolts that are set before the concrete has been placed shall be carefully held in templates. Where specified in the Contract Documents, anchor bolts shall be provided with square plates at least 4 inches by 4 inches by 3/8 inches. Alternatively, provide anchor bolts that have square heads and washers and set in the concrete forms with pipe sleeves.
- 2. Concrete inserts shall be designed by the Seller to support safely, in the concrete that is used, the maximum load that can be imposed by the hangers used by the inserts. Provide galvanized inserts which permit adjustment of the hangers both horizontally (in one plane) and vertically and locking of the hanger head or nut.
- 3. Seller shall provide assembly hardware in accordance with the complete parts list. All assembly hardware shall be 316 stainless steel, labeled, and package separately for delivery to the job site.

C. Foundations, Installation, and Grouting

- 1. Buyer to furnish the necessary materials and construct concrete foundations for all equipment installed. Foundation size and elevations may be determined in the field by the Engineer. The tops of foundations shall be at such elevations as will permit grouting as specified below.

2. Allow for setting pumps, motors, and other items of equipment using at least 1 inch for grout under the equipment bases and the use of steel shims to level and adjust the bases.

3.3 QUALITY CONTROL

A. Performance Tests - General

1. All equipment, components and systems furnished under this Contract, must be demonstrated to achieve compliance with the Contract performance requirements.

B. Services of a manufacturer's representative

1. Arrange for a qualified service representative from each company manufacturing or supplying equipment to perform the work described in this section.
2. Inspect, operate, test, and adjust the equipment after installation has been completed and the equipment is presumably ready for operation, but before it is operated by others. At a minimum, include the following points in the inspection:
 - a. Soundness (without cracked or otherwise damaged parts).
 - b. Completeness in all details, as specified.
 - c. Correctness of setting, alignment, and relative arrangement of various parts.
 - d. Adequacy and correctness of packing, sealing and lubricants, etc.
3. Operate, test, and adjust equipment to prove that it is left in proper condition for satisfactory operation under the conditions specified.
4. Upon completion of this work, submit, 3 copies to the Engineer of a complete, signed Inspection Report with the results of this inspection, operation, adjustments, and tests. Include in the Inspection Report a detailed description of the points inspected, tests and adjustments made, quantitative results obtained, and suggestions for precautions to be taken to ensure proper maintenance. Certify in the report that the equipment (1) has been satisfactorily installed and conforms to the Contract Documents; (2) is in accurate alignment; (3) is free from any undue stress imposed by connecting piping, supports or anchor bolts; (4) has been operated under full load and operates satisfactorily; and (5) that nothing in the installation will render the manufacturer's warranty null and void.
5. After the Engineer has reviewed the reports from the manufacturer's representatives, make arrangements to have the manufacturer's representatives present when the field acceptance tests are made.

C. Off-Site Inspection - Fabrication, manufacture, painting or testing work may be inspected by the Engineer before shipment. Give notice to the Engineer of the place and time where such fabrication, manufacture, testing, or shipping is to be done. Such notice shall be in writing and delivered to the Engineer in ample time so that the necessary arrangements for the inspection can be made.

3.4 CLOSEOUT ACTIVITIES

A. Operator Training

1. Upon satisfactory completion of the start-up and calibration, provide the services of a manufacturer's trained representative to instruct Owner's personnel in the proper operation and maintenance of the equipment. This separate period of on-site training shall be provided independent of start-up and testing services.
2. The manufacturer's trained representative who will be providing the instruction shall have prior operation, maintenance and instructing experience acceptable to the Engineer.
3. When requested, submit the manufacturer's trained representative's name and qualifications to the Engineer for approval at least one week prior to the scheduled operating and maintenance instruction sessions.
4. Provide the Owner with a minimum 7 days written notice of planned operator training.
5. Coordinate the scheduling of on-site training to meet the following requirements:
 - a. No single training session shall be more than 6 hours duration or 4 hours if specified to occur on 2 or more separate days.
 - b. Training shall not be scheduled on two consecutive days.
 - c. No more than 3 training sessions shall be scheduled in any week.
 - d. Training sessions shall not be scheduled for Saturdays, Sundays or holidays.
 - e. Upon completion of training for each manufacturers equipment, provide Certificate and Instruction that that manufacturers equipment.

3.5 PROTECTION

- A. Protection Against Electrolysis - Where dissimilar metals are used in conjunction with each other, provide insulation between adjoining surfaces to eliminate direct contact and any resultant electrolysis. Use bituminous impregnated felt, heavy bituminous coating, non-metallic separators or washers, or other approved materials as insulation materials.

3.6 MAINTENANCE

- A. Lubricants - Prior to testing and acceptance, furnish a one year's supply of all lubricants recommended by the manufacturers of each component of the equipment provided.
- B. Spare Parts - Pack spare parts in containers or boxes bearing labels clearly designating the contents and the piece of equipment for which they are to be used.
- C. Special Tools - For each type of equipment furnished, provide a complete set of special tools (including grease guns or other lubricating devices) which may be necessary for the adjustment, operation, maintenance, and disassembly of such equipment. Tools shall be high-grade, smooth, forged, alloy, tool steel. Grease guns shall be lever type.

Special tools are considered to be those which because of their limited use are not normally available, but which are necessary for the particular equipment.
- D. Submit operation and maintenance manuals for items listed in pertinent other sections of these Specifications and for other items when requested by the Engineer.

Provide manuals a minimum of 60 days prior to equipment start-up. Manuals shall comply with the requirements of Section 01770.

- E. Submit Final Documentation, Equipment Startup Reports in accordance with Section 01770.

END OF SECTION

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SECTION 11262

ULTRAVIOLET DISINFECTION SYSTEM

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Ultraviolet (UV) Disinfection System designed to disinfect the Water Pollution Control Facility (WPCF) effluent and retrofitted into the existing chlorine contact tanks within new UV channels to be constructed by the Buyer in accordance with the specifications (design and layout) provided by the Seller.
2. This Section includes the furnishing of all Goods and Special Services required whether specifically mentioned in this Section or not, as required for a complete operational System and as needed to assist in installation, commissioning, performance demonstration testing, to provide a complete System and ready for operation.
3. This Section gives a general description of what is required, but does not purport to cover all details, as these will vary in accordance with the design requirements of specific equipment.
4. The UV Disinfection System shall include the UV Modules (including lamps and sleeves), power supply units, system controls, automatic mechanical cleaning system, chemical cleaning system, variable output electronic ballasts, UV module lifting devices, chemicals, UV shields, special tools, spare parts, and other ancillary equipment as required for a complete operational UV disinfection system. All major components of the system shall be assembled and tested in the factory prior to shipment.
5. Seller shall furnish, start-up, test, adjust, and put into operation all instrumentation, controls equipment, and related programming directly related to the UV disinfection system and furnished by the Seller including, but not limited to, programmable logic controllers (PLCs), power monitoring system, operator interface, indicators, control stations, controllers, push buttons, lights, selector switches, uninterruptible power system (UPS) for the System Control Center (SCC), power and control as required for a complete operational system. The Seller shall provide a complete instrumentation and control system.
6. Special Services shall include installation verification, commissioning, startup, training, performance demonstration testing as well as coordination with the Buyer, the Owner and the Plant Control System Programmer (PCSP) during construction for proper interface of the control system with the plant's Supervisory Control and Data Acquisition (SCADA) system.
7. The System shall disinfect the WPCF's effluent wastewater and produce effluent that complies with the Design Criteria in Paragraph 1.3 as demonstrated through performance demonstration testing specified in Paragraph 3.4. The

Seller's system shall be backed by a Performance Guarantee as required in Paragraph 1.4 and Performance Bond in Paragraph 1.9.

B. Related Sections

1. Section 01330 – Submittal Procedures
2. Section 01630 – Product Substitution During Constructions
3. Section 01770 – Closeout Procedures
4. Section 11000 - Equipment – General

C. Summary of Existing WPCF Processes, Permit, and Proposed Changes

1. The existing WPCF utilizes a combination of processes to treat the WPCF influent. The main wastewater processes include 1/2-inch mechanical screens, vortex grit removal, primary settling, secondary treatment in aeration tanks using a Powdered Activated Carbon Treatment activated sludge system with Wet Air Regeneration (Zimpro PACT-WAR) followed by secondary clarification, sand filters, disinfection by sodium hypochlorite, dechlorination, and post aeration. The existing WPCF nitrifies year-round but is not currently designed to remove nitrogen or phosphorus. Refer to Figure 1 in Appendix A for a process flow diagram of the existing WPCF. The WPCF's operating data are included in Appendix B for information purposes only. It should be noted that the Zimpro PACT-WAR process generates a high strength recycle stream to the head of the aeration tanks.
2. As part of the project that this System will become part of, the existing WPCF will be substantially upgraded to meet new, stringent effluent water quality requirements. The project will include major changes to the entire WPCF including replacing the mechanical screens with fine (1/4-inch) screens, replacing the influent screw pumps with centrifugal pumps, replacing the Zimpro PACT-WAR system with an Integrated Fixed Film Activated Sludge (IFAS) treatment system in the reconfigured aeration tanks to provide a 4/5 stage Bardenpho configuration, the addition of a new multi-point chemical addition system for phosphorus removal, replacement of the sand filters with cloth media filters, and replacement of the chlorination and dechlorination systems with ultraviolet (UV) disinfection. New aerated unthickened sludge storage tanks, Rotary Drum Thickeners (RDTs), mixed thickened sludge storage tanks, and necessary pumping system will be installed for secondary solids handling for disposal of liquid sludge off site via truck. Primary sludge will continue to be thickened in gravity thickeners and also disposed off-site as a thickened liquid. In addition, most other process equipment, including grit vortex, primary clarifier mechanisms, primary sludge and scum handling pumps, secondary clarifier mechanisms, RAS, WAS, and secondary scum pumping systems, and post aeration equipment will be upgraded in-kind. Refer to Figure 2 in Appendix A for the proposed process flow diagram after the upgrade is complete.

3. The project will incorporate the New England Interstate Water Pollution Control Commissions' TR-16 resiliency requirements which most notably require providing uninterrupted treatment at peak hour flow up to a 100-year flood elevation, and protecting equipment from damage due to flooding based on a 100-year flood plus 3 feet while passing peak hour flow through the WPCF. Refer to Figures 3 and 4 in Appendix A for a hydraulic profile of the existing and proposed systems; respectively.
4. An IFAS Treatment System will be preselected as part of the plan to replace the existing Zimpro PACT-WAR system while reusing the existing aeration tanks. The IFAS Treatment System will receive effluent from the primary clarifiers and utilize a four or five-stage biological nutrient removal configuration (varies seasonally) to treat wastewater before discharging to the existing secondary clarifiers. The IFAS Treatment System will be used to comply with the WPCF's NPDES permit which includes an ammonia and BOD monthly average limit. In addition, the IFAS Treatment System will be used to comply with the Long Island Sound Nitrogen TMDL, which currently includes a mass-based annual average limit of 184 lbs/day. Based on the 20-year projected average annual plant influent/effluent flow of 4.8 MGD, this represents an average effluent total nitrogen (TN) concentration of less than 4.5 mg/l as N. At the permitted average annual capacity of 7.1 MGD, this represents an average effluent TN concentration of less than 3.1 mg/l as N. During and just prior to the phosphorus removal season of April 1 through October 31, the primary clarifiers will be operated in a manner to remove phosphorus chemically and the IFAS treatment system will also be operated in a manner to remove phosphorus both chemically and biologically. The target total phosphorus concentration leaving the IFAS Treatment System will be less than or equal to 1.0 mg/l.
5. A Cloth Media Filtration System will be preselected to replace the existing sand filters currently located within the existing sand filter building. During the phosphorus removal season of April 1 through October 31, the secondary clarifier effluent will be pumped via the intermediate pump station to the cloth media filtration system rapid mix tanks. The intermediate pump station pumps will be replaced and will be sized as required by the Cloth Media Filtration System hydraulics. Effluent from the cloth media filters will flow by gravity to the new UV Disinfection System. The Cloth Media Filtration system will be used to comply with the WPCF's NPDES permit which currently includes a total phosphorus mass-based seasonal average limit of 4.56 lbs/day. At the permitted capacity of 7.1 MGD, the WPCF's effluent phosphorus concentration represents a concentration of 0.077 mg/l on average over the season. In addition to the seasonal mass-based limit, the Vernon WPCF must also meet the less stringent average monthly and maximum daily total phosphorus concentration limits of 0.22 mg/l and 0.44 mg/l, respectively. The Permit also limits effluent pH to between 6 and 9 Standard Units. The Cloth Media Filtration System will utilize either iron or aluminum based coagulants as part of the treatment

process. These coagulants may result in an iron or aluminum residual product carryover in the effluent and thus to the UV Disinfection System.

6. A UV Disinfection System (to be located within the existing chlorine contact tanks) will be preselected to replace the existing chlorine disinfection system including chlorine contact tanks, sodium hypochlorite addition system, and sodium bisulfite addition system. Refer to Figures 5 and 6 for pertinent details of the existing chlorine contact tanks. During the disinfection season (May 1 through September 30, which is also entirely within the phosphorus removal season), effluent from the Cloth Media Filtration System will flow by gravity from the cloth media filters to the UV Disinfection System. During the remainder of the year the secondary clarifier effluent will flow by gravity through the UV Disinfection System channels, and the lamps will, at the Owner's discretion, either be removed for storage, left in the channels and turned off, or left in the channels and operated. During the disinfection season, the UV Disinfection System will be used to comply with the WPCF's NPDES permit which currently includes an *e. coli* limit of 126 cfu/100 mL on a calendar month geometric mean basis with a maximum instantaneous limit of 410 cfu/100 mL. The permit also includes a fecal coliform limit of 200 cfu/100 mL on a calendar month geometric mean basis, and a limit of 400 cfu/100 mL on a calendar week geometric mean basis
7. The above summary is for general information only and shall not be construed as a guarantee of influent conditions to the systems to be preselected in this specification or as a performance requirement of the system to be preselected in this specification.

1.2 PRESELECTION OF EQUIPMENT

- A. The Owner intends to pre-select the equipment and services specified in this section (Goods and Special Services) for the Vernon WPCF. The equipment specified herein shall be purchased by the Buyer from the successful Bidder at the prices bid in the Bid Form or as otherwise allowed in these Contract Documents.
- B. All requirements described herein are considered minimum requirements and must be met in order for a Bidder to be deemed responsive. The Owner reserves the right to request additional information, if required to make this determination, to show that the requirements herein have been met.
- C. The Goods and Special Services specified in this section shall be furnished by one Seller responsible for designing, furnishing, starting up, and testing all components of the system specified in this section.
- D. The following is a summary of the preselection requirements for the Seller of the equipment specified in this Section. If the following language is in conflict with language elsewhere in these documents, then the more restrictive and/or comprehensive requirements apply.

1. Bidders shall provide the information requested on the Bid Form (Section 00410) including but not limited to performance guarantees so that the Owner

can evaluate the Bidder's qualifications and equipment proposal in accordance with the Instruction to Bidders (Section 00200) to select the successful Bidder.

2. During the preselection process, the Owner will evaluate the bids from Bidders in accordance with the criteria specified in the Instructions to Bidders (Section 00200) and as clarified on the Bid Form (Section 00410). This includes a monetary evaluation to determine the present worth of the proposed System by evaluating capital and operational and maintenance costs as well as a non-monetary evaluation of factors.
3. Provide "Preliminary Submittals" in accordance with the Schedule provided in the Bid Form (Section 00410).
 - a. Preliminary submittals shall supplement (and if approved by Engineer, replace) information provided with the Bid and together with the bid submission provide sufficient detail to allow the Engineer to design the project and produce final design documents suitable for public bidding by construction contractors.
 - b. This includes dimensions of all equipment furnished under this Section, constraints for locating equipment, and piping connections.
 - c. Provide Engineer assistance in developing final design documents and drawings. This will include preliminary submissions of all major equipment components that are sufficient in detail to design the layout and coordinate all equipment interfaces. Some of the information identified in Paragraph 1.5 may be required. This coordination shall continue until the WPCF upgrade design has been completed. Such coordination may include review of Engineer's draft drawings and specifications to confirm that they are consistent with the Bidder's design intent including items such as system sizing and arrangement, process flow configurations, P&IDs, equipment locations, reviewing and approving specifications equipment provided by others.
4. During the design phase, the Bidder may be required to make additional submittals, revise specific components, and work on issues of equipment compatibility with other suppliers. Facility drawings, equipment data sheets, process descriptions and other information are required to assure that the related equipment and facilities are coordinated and suitable for the equipment offered by the Bidder.
5. Notice of selection to the Bidder and execution of an Agreement with the Owner to be considered in the design does not constitute the release of the Bidder's Bid Bond. The Seller's Bid Bond shall only be released when the Bidder executes an agreement with the Buyer (the Successful Construction Contractor).

1.3 DESIGN CRITERIA

- A. Provide equipment which shall disinfect the Vernon Water Pollution Control Facility effluent over the full range of flows with the following characteristics:

Flow Rates (MGD)

Peak hourly flow rate	22.0
Maximum day flow rate	12.3
Design average day flow rate	4.8
Current average day flow rate	2.95
Typical daily low flow rate	0.6

Maximum total suspended solids (mg/l)	30
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Temperature (degrees F)

Effluent temperature range (disinfection season) ¹	40 to 80
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Ambient air temperature range (disinfection season) ¹	32 to 106
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Ultraviolet transmittance ²	As Defined Below
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Notes: ¹ The disinfection season is May 1 through September 30

² Ultraviolet transmittance is defined at 253.7 nm

- B. Design the UV disinfection equipment to disinfect Vernon WPCF effluent, given the influent conditions specified in Paragraph 1.3A of this Section, to the following performance criteria:

1. The UV system shall be able to treat the Peak Hourly Flow Rate, given an ultraviolet transmittance as low as 65% and provide a UV dose of 30 millijoules per centimeter squared (mJ/cm²) minimum in the effluent, *with one UV module (or bank of modules) per channel out of service.*

2. Required effluent quality from UV channel:

Maximum Escherichia coli Effluent, based on 30 day geometric mean (CFU/100ml)	126
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Maximum Daily Escherichia coli Effluent, based on daily maximum (CFU/100ml)	410
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Based on grab samples taken in accordance with the microbiology sampling techniques found in *Standard Methods for the Examination of Water and Wastewater*, latest edition.

3. The UV system shall be able to activate all UV modules/banks of modules during the peak flows under the above influent conditions, if needed, when the ultraviolet transmittance may be below the specified design conditions. It shall be possible to place all UV modules, including the spares online to achieve greater inactivation of Escherichia coli.

- C. The following design factors (lamp life, quartz transmission, quartz fouling) are the maximum that may be used in the Seller's design calculations. No factors used for the design calculations can exceed the manufacturer's own validated factors. All factors have to be proven with third party validation test reports provided with the bid:

Lamp Life Factor	0.80
Quartz Transmission Factor	0.90
Quartz Fouling Factor	0.88

- D. The UV Disinfection System shall produce a MS2 RED equal to or greater than the minimum MS2 Design RED of 30 mJ/cm² specified herein at the peak hourly flow rate, the design UVT and under Attenuated Lamp Conditions. The basis for evaluating the dose delivered by the UV Disinfection System shall be the Supplier's bioassay results as determined by Third-Party Reactor Validation Testing per the NWRI UV Guidelines (2012), using the standard MS-2 dose response curve, with the Confidence Ratio (CR) set to 1.00.
- E. The UV system shall be capable of providing continuous disinfection while UV lamps, quartz sleeves, and/or ballasts are replaced and while cleaning the UV lamp sleeves.
- F. General Design Criteria
1. The UV equipment shall be installed in two new parallel concrete channels within the existing chlorine contact tanks, to house their equipment in order to treat the wastewater influent to the UV channels described above. Concrete channels will be designed in accordance with the Seller's recommendations within the limitations of the existing chlorine contact tanks. Each channel shall carry approximately one-half of the required system design flow. Flow through each channel is started and stopped by inlet gates provided by others but selected and installed in accordance with the Seller's recommendations. Both channels will normally be online unless one channel is temporarily isolated for maintenance of the UV Disinfection System or the post aeration system. The flow split shall be determined by the channel configuration and hydraulics (selected and installed in accordance with the Seller's recommendations) and the downstream weirs (designed and provided by the Seller).
 2. The head loss through the UV disinfection system shall not exceed 8 inches at Peak Hour Flow with both UV channels in service. The head loss through the UV disinfection system shall be based on the peak hour flow with all UV equipment installed and in the channel.
 3. The UV equipment shall be designed to treat the peak hourly flow rate during a 100-year flood with the downstream weirs not surcharged.
 4. The UV equipment shall be designed to be protected from damage with a river elevation equal to the 100-year flood plus three feet and peak hour flow passing through the plant as shown in the hydraulic profile in Appendix A. Under these conditions, the effluent weirs will be surcharged, the control panels for the UV

system will be above the flood water level, and the UV system shall be capable of being operated, but the effluent treatment limitations shall not apply.

1.4 PROCESS PERFORMANCE GUARANTEE

- A. The UV disinfection system performance as specified here-in shall be guaranteed for a period of 12 months from the date of the successful completion of the Performance Demonstration testing. During this period when the UV disinfection system influent flow (measured at the UV effluent) meets the criteria in Paragraph 1.3A of this Section, the Seller guarantees the following:
 - 1. The UV equipment will produce an effluent which meets or exceeds the Performance Requirements in Paragraph 1.3B of this section, including the bacteriological performance criteria specified in these technical specifications.
 - 2. The UV equipment's annual operation and maintenance costs will be at or less than the guaranteed values in the Seller's bid, as noted on the Section 00410 Bid Form (Section 5.3.B.).
- B. Should the System fail to meet the required performance requirements, then the Process Performance Guarantee shall require that the Seller shall comply with the following:
 - 1. If the Performance Requirements in Paragraph 1.9.B. of this specification and the Performance Guarantees and guaranteed Operations and Maintenance criteria provided by the Seller on the Bid Form 00410 (Section 5.3.B.) are not met, the Seller shall immediately, upon notice from the Engineer, make changes to the equipment such that process performance as guaranteed is obtained at no additional cost.
 - 2. If, after two attempts at implementing corrective measures, it cannot be demonstrated that the System can consistently meet the Performance Requirements in Paragraph 1.9.B., the Seller shall reimburse the Owner for all payments made and forfeit rights to all remaining payments under the Contract with the Buyer and forfeit and surrender its Performance Bond.
 - 3. If it is demonstrated that the System can consistently meet the Performance Requirements in Paragraph 1.9.B. during the Performance Demonstration and during the 1 year Performance Monitoring period, but cannot achieve the Seller's Performance Guarantees and Operations and Maintenance guaranteed values provided by the Seller on the Bid Form 00410 (Section 5.3.B.), the Seller shall pay an O&M Performance Penalty. Unless otherwise specified, the amount of the O&M Performance Penalty shall be equal to the present worth value over a twenty-year period of the calculated difference between the costs for the guaranteed O&M values and the actual (measured during the performance demonstration tests). The calculations will be performed in the same manner as O&M annual cost calculations used in the bid evaluation to select the Seller during pre-procurement. See the Instructions to Bidders (Section 00200). This means that the O&M Performance Penalty will not be

assessed unless the total (considering in aggregate the usage of chemicals, electricity, replacement parts, and labor costs to maintain the equipment) present worth costs change.

4. In the case that the System fails to meet the effluent permit limits specified in paragraph 1.3.B, the Seller shall pay up to \$37,500 per NPDES effluent violation incurred by the Owner resulting from a disinfection effluent violation.
- C. The maximum value of the penalties assessed under this guarantee shall be in accordance with the limits specified in the Agreement (Section 00520, paragraph 11.6).

1.5 SUBMITTALS DURING CONSTRUCTION

A. General

1. Comply with the pertinent provisions of Section 01330 – Submittals.
2. Coordinate submittals with the Buyer and deliver when directed by the Buyer, unless indicated otherwise below.
3. Provide submittals in a timely manner to ensure approval, fabrication and delivery of all equipment and appurtenances as required by the Buyer's schedule requirements.

B. Seller Certifications

1. Seller shall review the UV system design in the construction contract including the influent weir gates, channel design, downstream baffle wall and other hydraulic factors as indicated on the hydraulic profile, and submit signed certifications that the proposed design is fully acceptable and will in no way void the Performance Guarantee requirements of this Section.

- C. As specified in Section 01330, submit certifications for all applicable iron or steel products indicating that all manufacturing processes occurred in the United States.

D. Submit for review shop drawings showing the following:

1. Complete description in sufficient detail to permit an item comparison with the specification.
2. Dimensions and installation requirements.
3. Descriptive information including catalog cuts and manufacturer's specifications for all components.
4. Electrical schematics and layouts.

- E. Hydraulic calculations demonstrating hydraulic characteristics, including head loss calculations.

- F. Product Data: Provide construction details, material descriptions, dimensions of individual components and profiles, and finishes for each component.

- G. Shop Drawings: Provide plans, elevations, sections, details, and attachments to other work.
1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 2. Manufacturer and model number of all equipment within this specification, and an itemized list of components being furnished.
 3. Layout drawings and equipment cut sheets showing dimensions, clearances, sizes, arrangement and size of connections, supports, anchors, and total weights of the product.
 4. Detailed specifications and data describing the materials of construction.
 5. Equipment characteristics, specifications, and performance:
 - a. Descriptive bulletins
 - b. Outline drawings with dimensions
 - c. Parts list
 - d. Nameplate data
 - e. Special features
 6. Complete performance data including input KW over the full operating range.
 7. Equipment weights and lifting points.
- H. Information Submittals:
1. UL/ULC certification documentation
 2. Factory functional and performance demonstration test reports and log.
 3. Special shipping, storage and protection, and handling instructions.
 4. Manufacturer's instructions for installation.
 5. Manufacturer's equipment installation report.
 6. Location of nearest stocking distributor of spare parts.
 7. Suggested spare parts list to maintain the equipment in service for a period of one year. Include a list of special tools required for checking, testing, parts replacement, and maintenance with current pricing information. Include guaranteed pricing per the Bid requirements.
 8. List special tools, materials, and supplies furnished with equipment for use prior to and during startup and for future maintenance.
 9. Warranty certificate

10. Performance Guarantee

I. Performance Data:

1. Bioassay test report prepared by a certified laboratory independent of the manufacturer. The bioassay shall show the UV dose produced by the system as a function of flow per lamp. Sizing calculations based on validation data must show compliance with the specification. The manufacturer's bioassay validation methodology as carried out by an independent third party, shall follow protocols described in the *U.S. EPA Design Manual - Municipal Wastewater Disinfection (EPA/625/1-86/021)* and be in accordance with NWRI Ultraviolet Disinfection Guidelines for Drinking Water and Water Reuse (May 2003).

J. Control and Electrical Systems Submittals:

1. Control and electrical system submittals shall provide complete documentation of the proposed hardware, including but not limited to control panel hardware, circuit breakers, control panel layout, Programmable Logic Controllers (PLCs), input/output (I/O) modules, Operator Interface Terminals (OITs), computers if required, communication equipment, cables, peripherals, etc.). A complete Bill of Materials (BOM) listing all hardware equipment shall be provided.
2. System Block Diagrams
 - a. Complete schematic system block diagram(s) showing the interconnections between major hardware components.
 - b. The block diagram(s) shall reflect the total integration of all control devices in the System and any OIT locations. Location of all components shall be clearly identified with appropriate cross-references.
 - c. Diagrams shall reference all interconnecting cabling requirements for digital components of the System including any data communication links.
 - d. Block diagram(s) shall reflect the integration of the Equipment Supplier's control system in the plant wide SCADA system. Location and division of responsibility shall be clearly identified.
3. Data Sheets
 - a. A data sheet for all major hardware components listing all model numbers, options, auxiliary and ancillary devices that are being provided.
 - 1) The data sheets shall be provided with an index, proper identification and cross referencing. They shall include, but not be limited to, the following information:
 - 2) Product (item) name used herein and on the Contract Drawings

- 3) supplier's complete model number
 - 4) Location of the device
 - 5) Input/output characteristics
 - 6) Range, size and graduations
 - 7) Physical size with dimensions, enclosure NEMA classification and mounting details
 - 8) Materials of construction of all components
 - 9) Power supply device sizing calculations where applicable
4. System Input / Output
- a. Submit a complete Input / Output (I/O) list for devices connected to the control system under this Contract. The I/O list shall be submitted in a Microsoft Excel readable electronic file format and an 8-1/2-in by 11-in hard copy. The I/O list shall include, but not be limited to, the following information:
 - 1) Tag number(s)
 - 2) Description
 - 3) Physical location
 - 4) Physical point address
 - 5) I/O type
 - 6) Range & Engineering Units (for Analog I/O)
 - 7) Where multiple mechanical components are provided for process redundancy, their field connections to I/O modules shall be arranged such that a failure of a single I/O module will not disable all mechanical components of the redundant system.
5. Control Panel Layout and Wiring Drawings
- a. Panel Layout Drawings: Drawings shall be furnished for all panels, consoles, and equipment enclosures. Panel assembly and elevation drawings shall be drawn to scale and detail all equipment in or on the panel. Panel drawings shall be 8.5"x11" or 11"x17" in size. As a minimum, the panel drawings shall include the following:
 - 1) Interior and exterior panel elevation drawings to scale.
 - 2) Nameplate schedule.
 - 3) Conduit access locations.
 - 4) Panel construction details.

- 5) Cabinet assembly and layout drawings to scale. The assembly drawing shall include a bill of material on the drawing with each panel component clearly defined. The bill of material shall be cross-referenced to the assembly drawing so that a non-technical person can readily identify any component of the assembly by supplier and model number.
 - 6) Fabrication and painting specifications including color (or color samples).
 - 7) Heating and cooling calculations for each panel supplied indicating conformance with cooling requirements of the supplied equipment and environmental conditions. If cooling or heating equipment is provided, provide calculations to justify the sizing of the equipment.
 - 8) Submit evidence that all control panels shall be constructed in conformance with UL 508 and bear the UL seal confirming the construction. Specify if UL compliance and seal application shall be accomplished at the fabrication location or by field inspection by UL inspectors.
 - 9) Submit dimensional drawings of floor layout including location plans for control panel (to be established by the Engineer), wiring external to panel, work that requires dimensional coordination with other trades, conduit routing, working clearances, and operator controls.
- b. Panel Wiring Diagrams: Panel wiring diagrams depicting wiring within and on the panel as well as all connections to external devices. Panel wiring diagrams shall include power and signal connections, UPS and normal power sources, all panel ancillary equipment, protective devices, wiring and wire numbers, and terminal blocks and numbering. Field device wiring shall include the device ISA-tag and a unique numeric identifier. The diagrams shall identify all device terminal points that the system connects to, including terminal points where I/O wiring lands on equipment not supplied by the Seller. I/O wiring shall be numbered with rack number, slot number, and point number. Two-wire and four-wire equipment shall be clearly identified and power sources noted. Submit final wire numbering scheme.
6. Control System Standards and Conventions Submittal
- a. Seller shall coordinate with the Plant Control System Programmer (PCSP) and provide a control system that is in accordance with the standards and conventions established by the PCSP for the WPCF's SCADA system. Since the WPCF already has an existing SCADA system, the PCSP will be responsible for aligning these standards and conventions with the existing SCADA system as agreed to by the Owner.

In addition to coordination required during shop drawings review, Seller shall allow for a minimum of three two-hour conference calls for coordination. Note that the Plant Control System Supplier (PCSS) will be responsible for providing the plant's new control system hardware, software, and licensing (except for control panels furnished as part of a Seller's equipment package), and the PCSP will be responsible for programming the plant's new control system hardware and software (except for control panels furnished as part of a Seller's equipment package) and coordinating the tags and tag addressing for all equipment.

- b. This submittal shall include the standards and conventions used to organize, develop and provide a consistent control system with the plant SCADA system. Standards shall be developed for the following as a minimum:
 - 1) Naming Conventions
 - 2) Operator interface, set point entry, equipment control, display navigation
 - 3) Graphic standards, colors, equipment symbols, etc.
 - 4) System security
 - 5) Alarming

7. Plant Network Topology

- a. Allocate space within panel for installation of (2) copper Ethernet patch ports (Phoenix Contact CADIN1IG or equal) by others. Each port shall be terminus of copper cables from Plant Network. One port shall be connected to Seller's PLC with patch cable provided by Seller. Other port shall be spare and available for Plant Control System Programmer's access to Plant Network.
- b. All Seller-supplied control panels requiring ethernet connection beyond that of a PLC, OIT, laptop port, and plant network connection shall be on a Control Network which is separate from the Plant Network. Use of NAT (network address translation) or a 'converged' network is an exception to a separate network and must be reviewed and approved by Engineer. Exceptions will be granted on a case-by-case basis and require coordination of IP addresses and use of a managed switch. Managed switch shall match Plant Network switches provided elsewhere in this project.

8. Operator Interface

- a. Provide a printout with a screen shot of each proposed screen on the Operator Interface Display touch screen, with a description of the proposed functionality of each of the buttons and a description of the meaning of each output.

- b. This submittal shall cover the specific system control schemes as well as the details of the process graphic displays.
 - c. The submittal shall contain the semifinal details of all logs, reports, and process graphic displays. The specifics of what shall appear on each display and what calculations are required to support them shall be developed and submitted.
 - d. A complete listing of all signals to be collected for long term historical information shall be provided. This listing shall include frequency of data sampling and duration for which the data shall be immediately accessible.
 - e. A complete listing of all signals to be collected for trend display shall be provided. This listing shall include frequency of data sampling and duration for which the data shall be immediately accessible.
9. Process Control Strategy
- a. Provide a process control narrative that describes the overall UV Disinfection System, sequence of control for normal, alternate (such as manual), and emergency operations, interlocks, data collection and recording, alarms, and set points.
 - b. The process control schemes shall be developed in ladder logic diagram (unless alternative language is approved by Engineer) based on information from the Specifications. Included with each diagram shall be:
 - 1) Brief scope of the Control Function
 - 2) Listing of all scanned inputs to the control function
 - 3) A narrative of the control strategy
 - 4) Any assumptions made in developing the program
 - 5) I/O database listing showing all field inputs and outputs (i.e., AI, DI, AO, DO) associated with the control function.
 - 6) Cross reference list of all I/O showing to which I/O modules or software modules they are linked
 - 7) Listing of all operator inputs/outputs to and from the control function. Any special displays related to the function shall be illustrated. A description of the operation of any panels shall be described as it relates to the control function.
 - 8) Listing of alarms
 - 9) Description of how alarms will be handled and affect the process

- c. This submittal shall cover all of the associated logic required to implement the control functions specified.
- d. Submit annotated PLC logic in 8-1/2-in by 11-in format. In addition, each network or rung shall be annotated so that a person can read and easily comprehend what control function the rung or network is performing.

10. Coordination Submittals

- a. Seller shall contact and coordinate with the PCSP to ensure compatible configuration of the Seller's PLC(s) and related devices in order to match the Plant Network. Seller shall configure the Seller's equipment network addresses, IP addresses, and Subnet mask in their equipment to match the addresses determined by the PCSP. Software communication shall be provided in contiguous registers.

K. Submittals for UV disinfection system instrumentation

- 1. Provide complete equipment specifications, details of connections, wiring, range and dimensions. Submittals consisting of only general sales literature will not be acceptable.
- 2. Submit detailed information for each instrument or control device, including manufacturer's descriptive literature and a specific data sheet for each device which shall include as a minimum:
 - a. Manufacturers complete model number.
 - b. Location of the device.
 - c. Input - output characteristics.
 - d. Range, size, and graduations.
 - e. Physical size with dimensions, enclosure NEMA classification and mounting details.
 - f. Materials of construction of all components.
- 3. Exceptions to the Specifications or Drawings shall be clearly defined by the Seller. Data shall contain sufficient details so the Engineer may make a proper evaluation.

L. Operation and Maintenance manuals

- 1. Manuals shall comply with the requirements of Section 01770.
- 2. Provide Final O&M Manuals prior to the contract completion date in accordance with Section 11000.

3. Warranty information shall be provided in draft format with the Draft O&M Manuals and final properly dated warranties shall be provided as part of the Final O&M Manuals.
 - a. Warranty Information: List and explain the various warranties and include the servicing and technical precautions prescribed by the manufacturers or contract documents to keep warranties in force.

M. Structural Design Calculations

1. Submit, in accordance with Section 11000, structural calculations for mounting of all Goods (tanks, modules, module lifting devices, module support racks/UV shields, etc.) on support structures stamped and signed by a professional structural or civil engineer licensed in the State of Connecticut. Clearly indicate all loads acting on the support structure, the basis of design for the structure, and how the structure complies with the Connecticut Building Code.
2. The structural calculations shall also demonstrate that the anchoring of the Goods to the support structures is adequate to restrain the Goods from all applicable forces without damage. Applicable forces for designing the System components and anchoring systems shall include gravity, seismic, water sloshing, and wind forces. The design shall withstand all loads in submerged and non-submerged conditions. The Seller shall provide mounting and supporting details for compliance with State Building Code Seismic requirements including supports for the Goods.
3. Perform seismic analysis and design in accordance with criteria established in Section 11000.

1.6 WARRANTY

- A. The Seller of the system shall warrant that the UV disinfection system shall be free from defects in design, material, and workmanship for 12 months from the date of final testing and acceptance. During this warranty period, upon notice from the Owner regarding defective components, material, or workmanship the Seller shall repair or replace all defective material and workmanship at no additional cost. The Seller shall fully address the warranty issue and complete repairs or replacement within 30 days of the receipt of a notice from the Owner.
- B. The UV lamps shall be warranted for a minimum of 12,000 hours service prorated after 9,000 hours of operation.
- C. The Ballasts shall be warranted for a minimum of 5 years prorated after 1 year.
- D. Guarantee shall also make all parts associated with the UV system available for shipment within 24 to 48 hours from USA location, or the said parts are free of charge from the manufacturer. This guarantee must be for a minimum of 10 years from substantial completion.
- E. Parts availability shall be guaranteed from the Seller for 20 years after substantial completion. Should replacement parts not be available from the Seller, said Seller

must replace all parts needed to bring the device to a working condition or replace the entire UV disinfection system with a complete system of equal performance.

- F. To the extent that these warrantee requirements are beyond the manufacturer's standard warrantee, the cost of providing this warrantee shall be listed on the bid form in the space provided.

1.7 EXTRA MATERIALS.

A. Spare Parts

1. Furnish a list of recommended spare parts with the Operations and Maintenance Manual.
2. Provide 1 full year of spare parts required for the operation and maintenance of the UV disinfection system.
3. In addition to the 1 full year of spare parts required by the specifications, provide the following spare parts:
 - a. UV Lamps: a quantity equal to 10% of the UV Lamps utilized in the system
 - b. Lamp Sleeves: a quantity equal to 10% of the UV Lamps utilized in the system
 - c. Lamp End Seals: a quantity equal to 20% of the UV Lamps utilized in the system
 - d. Electric Ballasts: a quantity equal to 10% of the Ballasts utilized in the system
 - e. Fuses and Breakers: a quantity equal to 10% of the total of each component utilized in the system
 - f. Lamp Cleaning Wipers, Seals, and Related Components: a quantity equal to 10% of the total of each component utilized in the system
 - g. UV Intensity Sensor & Analyzer: one (1) each with accessories
 - h. PLC Processor (Pre-Programmed): one (1)
 - i. Other spare parts as recommended by the UV Disinfection System Seller, as part of the bid or in the Seller's O&M manual.

B. Chemicals

1. Furnish cleaning chemicals required for startup and for 1 years of operation and maintenance of the UV equipment and accessories.

C. Oil and Lubricants

1. Furnish oil and lubricant and required for startup and for 1 years of operation and maintenance of the UV equipment and accessories.

D. Special Tools

1. Furnish one set of any special tools required for normal operation and maintenance the equipment. Tools shall be supplied and provided in a tool kit with each tool's use clearly labeled on the tool.

E. Replacement Parts

1. Replacement Part Costs shall be guaranteed by the Seller as specified on the Bid Form 00410 (Section 5.3.B.). Provide written proposal.

1.8 QUALITY ASSURANCE

- A. Unit Responsibility: All the equipment specified in this section shall be furnished by the Seller. Seller shall be responsible for the coordination and proper function of all the equipment, as an integrated system. Seller is responsible for delivery of equipment and supplies required under these specifications. The use of word "responsible" relating to the Seller is in no way intended to relieve the Buyer (Construction Contractor) from ultimate responsibility for equipment coordination, installation, operation, and guarantee. The Buyer shall bear ultimate responsibility for equipment coordination, installation, operation, and guarantees.
- B. Seller shall have experience manufacturing municipal wastewater ultraviolet disinfection systems with at least one such system operating at a wastewater treatment facility for a minimum of 5 years. In lieu of compliance with the specified experience period, submit a bond or cash deposit (in the form of an irrevocable letter of credit) in the amount of the contract value to guarantee replacement in the event of failure which shall remain in effect for 5 years following substantial completion.
- C. Shop Inspection: The Owner and Engineer reserve the right to witness the fabrication process to monitor compliance with the specifications. The Owner and/or Engineer may witness the progress of the System component fabrication through one or more separate shop inspections. Travel costs for shop inspections will be paid for by the Owner.
- D. Provide the services of a trained full-time employee of the Seller on the project site as the Seller's representative as required during the installation, commissioning, startup, training, and testing of the System as specified herein. The representative shall have complete knowledge of the equipment provided, including its proper installation, operation and maintenance. The representative shall be regularly engaged in overseeing equipment installations. The representative's qualifications shall be submitted to the Engineer for approval.

1.9 PERFORMANCE BOND

- A. As required in Article 4 of the General Conditions and Supplementary Conditions, the Seller shall provide a Performance Bond guaranteeing that the Seller completes the obligations specified in this Section, including achieving the Design Criteria specified in Paragraph 1.3 and the completion of the Seller's obligations under the Performance Guarantee specified in Paragraph 1.4.

1.10 SELLER'S SERVICE AGREEMENT

- A. The Seller shall provide a Service Agreement including continuing technical and operational support on the complete UV Disinfection System for two years following Substantial Completion and successful completion of the Performance Demonstration Test. Provide this cost as a separate item as listed in the Bid Form (Section 00410).
- B. Service Agreement shall include as needed telephone support and two site visits the first year and two site visits the second year. Each site visit must be no less than one (1) eight-hour day on site.
- C. This technical and operational support shall be in addition to any technical support required to resolve warranty-related systems or equipment problems.

1.11 DELIVERY, STORAGE, AND HANDLING

- A. The equipment, material, and spare parts shall be shipped complete except where partial disassembly is required by transportation regulations or for protection of components. Label items where partial disassembly is required to facilitate reassembly in the field. The bill of materials and a complete packing list specific to each shipment, shall be provided with the shipment to facilitate receipt of equipment.
- B. Equipment shall be packed by the manufacturer as to facilitate handling and protect from damage during shipping, handling and storage.
- C. Spare parts shall be packed in containers bearing labels clearly designating contents and pieces of equipment for which they are intended. Spare parts shall be packed such that the parts are protected for prolonged storage in an area without environmental controls.
- D. The Buyer shall unload, store and safeguard equipment, materials, and spare parts in accordance with the Seller's recommendations, Seller's representative shall be on site to accept and inspect equipment. If Buyer's delivery schedule requires outdoor storage for more than 45 days, Buyer shall prepare equipment for long term storage outdoors after Seller's inspection.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. The UV Disinfection System shall be designed and provided by the Seller.
- B. The UV Disinfection System shall be as manufactured by:
 - 1. Suez
 - 2. Trojan
 - 3. or equal
- C. UV Disinfection Systems including flow-through tubes will not be accepted.

2.2 GENERAL

- A. Affix nameplates with the name of the manufacturer, equipment model number and all other pertinent data to each unit at a visible and accessible location.
- B. All anchor bolts shall be furnished by the Seller and installed by the Buyer in accordance with the Seller's instructions and recommendations.
- C. Provide a complete UV system including UV lamps, sleeves, modules, banks, level control, instrumentation and UV control/monitoring system, and accessories, as required by the Seller to meet the specified performance.
- D. UV module(s) must be installed within open channels to create a UV reactor with support racks, UV shields and arranged in banks comprised of one or more modules.
- E. UV channel dimensions (length, width, depth) and channel water depths, shall be as required by the Seller, to meet the specified performance.
- F. At a minimum, one UV intensity sensor is required per UV module.
- G. All metal components in contact with effluent shall be Type 316L stainless steel.
- H. All material exposed to UV light shall be Type 316L stainless steel, Type 214 quartz, or Teflon™.
- I. Design system for only bolted connections in the field. Cutting or welding of any component in the field is not allowed.

2.3 LAMP ARRAY CONFIGURATION

- A. The lamp array configuration shall be evenly spaced for both horizontal and vertical rows with all lamps parallel to each other. The single array pattern shall be continuous and symmetrical throughout the reactor.
- B. Lamp electrodes shall operate at the same temperature and be cooled by the effluent.

2.4 UV MODULE

- A. Each UV lamp module shall consist of the required number of lamps to meet the performance requirement. Each lamp shall be enclosed in its individual quartz sleeve. Quartz sleeves shall be closed on one end and sealed by a lamp end seal and holder at the other end or open at both ends with lamp end seals at both ends. The latter style shall require twice the amount of specified spare seals.
- B. The electrical wires connecting the lamps and electronic ballasts shall be not be exposed to the effluent.
- C. Ballasts shall be housed in a separate enclosure located external to the channel and shall be to maintain internal enclosure temperatures below 120°F or lower if required by the Seller's equipment.
- D. Each UV module shall be supplied with sufficient cable to reach the Seller's Power Distribution Center (PDC). A minimum of 10 feet of cable (or longer as required based on the Sellers recommended layout) shall be supplied with plug/receptacle type systems for each module.

- E. An automatic interlock shall be incorporated into each module enclosure such that power to the lamps within shall be automatically shut off when the enclosure lid is opened.
- F. Materials of construction for the modules shall be stainless steel type 316L, anodized aluminium, quartz 214, and Teflon.
- G. The closed end of the quartz sleeve shall be held in place by means of a retaining O-ring. The quartz sleeve shall not come into contact with any steel in the frame.
- H. The ends of the lamp sleeve shall not protrude beyond the stainless steel frame of the UV Module.
- I. Lamp wires shall terminate in the electronic ballast enclosure.
- J. All lamp to ballast connections shall be made by and tested by the Seller.
- K. At the point of exit from the UV Module frame the multi-conductor cable shall pass through a waterproof strain relief.
- L. The electrical connections for each UV module shall be NEMA 4X rated.

2.5 UV LAMPS

- A. Low pressure high output, mercury slimline or amalgam UV lamps of the hot cathode, instant start or pre-heat start design. The arc current shall heat the coiled filamentary cathodes.
- B. The filament shall be of the clamped design, significantly rugged to withstand shock and vibration.
- C. Electrical connections at one end.
- D. Each connection shall have a maximum of four pins.
- E. 90% of UV output shall be within the wavelengths of 243.7 to 273.7 nm.
- F. Rated to produce zero levels of ozone.
- G. Lamp bases shall be of a metal and ceramic construction resistant to UV and ozone.
- H. The lamp base shall incorporate a dielectric barrier or pin isolator. The pin isolator shall consist of a non-conductive divider placed between the lamp pins to prevent direct arcing across the pins in moist conditions.
- I. UV lamps shall have a service life of not less than 12,000 hours.
- J. Lamps shall be easily removable for inspection and replacement.
- K. A remote lamp condition indicator shall be provided for each lamp.

2.6 LAMP END SEAL AND LAMP HOLDERS

- A. For horizontal systems or systems with fully submerged sleeves, the open end of the lamp sleeve shall be sealed by means of a Type 316L stainless steel sleeve nut which threads onto a sleeve cup and compresses the sleeve O-ring.
- B. For vertical systems or systems where the access end is not submerged, the open end of the lamp sleeve shall be sealed by means of a plug designed to prevent leaking.
- C. The sleeve nut shall have a knurled surface to allow a handgrip for tightening. The sleeve nut shall not require any tools for removal.
- D. The lamp shall be held in place by means of a molded lamp holder that shall incorporate two (2) seals. The lamp holder shall seal against the inside of the quartz sleeve to act as a second seal in series with the external O-ring seal.
- E. The second seal on the lamp holder shall isolate and seal the lamp from the module frame and all other lamps in the module.
- F. In the event of a quartz sleeve fracture the seals of the lamp holder shall prevent moisture from entering the lamp module frame and the electrical connections to the other lamps in the module.
- G. The lamp holder shall also incorporate a UV resistant plastic stop that shall prevent the lamp sleeve from touching the steel sleeve cup.

2.7 UV LAMP SLEEVES

- A. Rated for a UV transmission of 89% or better and shall not be subject to solarisation
- B. The nominal wall thickness shall be 1.0 to 2.0 mm.
- C. Manufactured from 214 Quartz glass

2.8 LEVEL CONTROL WEIRS

- A. Provide a weir system for each UV channel / post aeration tank (refer to figures in Appendix A) that is designed and sized to handle the full hydraulic load for that channel.
- B. Design and provide each weir system to:
 - 1. Evenly distribute flow across the post aeration tanks and avoid short-circuiting through the post aeration tanks when used in conjunction with the baffle walls.
 - 2. Be economically installed on the existing weir walls of the post aeration tank with minimum modifications of the existing weir walls. If necessary, include finger weir(s) on the existing weir wall.
 - 3. Maintain the minimum water depth variation, as required by the Seller, to protect the lamps and maintain the required performance during all flow conditions.
- C. The weir crest elevation will be established by the Owner at an elevation not higher than the existing weir crest elevation of 217.75 and not lower than elevation 216.5 to

allow for the weir crest to remain un-surcharged during 100-year floods, minimizing the impact on the post aeration system design, and minimize impact on the hydraulics upstream. Note that the existing weir is a broad-crested weir consisting of a chamfered 15-inch concrete wall with a top of wall elevation of 217.75 and that UV systems with high head losses will require a lower weir elevation to minimize the hydraulic impact upstream.

- D. Each Weir System shall be welded watertight and provided with associated components for mounting on the existing weir wall.
- E. Weirs and associated components shall be constructed of Type 316L stainless steel.
- F. Modification of the existing concrete weir wall, if required, will be by the Buyer.

2.9 UV LAMP MODULE SUPPORT RACK/CHANNEL UV SHIELD

- A. The module support rack/channel UV shield shall be Type 316 stainless steel and shall be suspended above the effluent in the channel by means of slotted angles allowing adjustment to the precise height of the channel and requiring no fastening of the individual UV lamp modules.
- B. The module support rack/channel UV shield shall be designed so that no ultraviolet light shall radiate above the channel when the UV lamp modules are energized and fully immersed in the effluent.
- C. At a minimum, provide module support rack/channel UV shields to cover the entire length of each channel.
- D. Design module support rack/channel UV shield to support a minimum uniform live load of 60 lbs per square foot.

2.10 UV MODULE LIFTING EQUIPMENT

- A. Provide one (or more if required) module lifting device(s) designed to remove all modules from the effluent channels for the purpose of maintenance and cleaning (in cleaning tanks if required by the Seller). The capacity of the lifting devices shall be adequate to lift a single module or bank of modules, as needed, from the channel. Self-contained motorized Automatic lifting devices provided as part of the modules which are designed to raise the modules from the channel for the purpose of maintenance and/or repair are acceptable to meet this requirement, however a means by which to remove the modules should the self-contained motorized system fail shall be provided.
- B. The Module Lifting device shall include, but not be limited to, an electric powered hoist (rated for outdoor locations), jib crane or other suitable travelling crane, or a self-contained motorized lifting device provided as part of the module.
- C. An adapter or lifting assembly shall also be furnished to enable lifting of one bank of modules at a time by the electric hoist system or a separate crane. Each module shall have means of connecting to lifting adapter. Connections for the adapter/lifting assembly shall be located so that each module is lifted from its center of gravity.

2.11 GENERAL ELECTRICAL REQUIREMENTS

- A. Provide complete Power and Control Systems to power, control and monitor the UV System. Supply all instrumentation and controls that are required to reliably and efficiently operate the system. The Power and Control System shall include, but not be limited to, the following:
 - 1. System Control Center (SCC) which shall be designed to provide all of the necessary control system functionality and provide power to instrumentation monitored/controlled
 - 2. The Power Distribution Centers (PDCs) which shall be a separate panel from the SCC
 - 3. Instrumentation and equipment specified in this section
- B. Maximum power draw to the UV system shall be 100 KW with all banks in operation including the redundant units.
- C. Wires exposed to UV light generated by the Seller's equipment shall be PTFE coated.
- D. Design the system for an electrical supply of 480 Volts, 3 Phase, 3 Wire (plus GND), 60 Hz.
- E. A separate 120 volt, 15 or 20 amp supply shall be available for the monitoring system if required by the UV manufacturer.
- F. Provide 120 volt, 20 amp receptacles rated for continuous use if required by the UV manufacturer's equipment for operation. Receptacles shall be of the duplex type, complete with ground fault interrupter circuitry.
- G. 480 Volt power shall not be allowed in the System Control Center. The step down transformer shall be located outside the System Control Center.
- H. Provide a suitable air exchange/cooling system to maintain internal enclosure temperatures below 120°F or lower if required by the Seller's equipment. Forced air ventilation shall not be allowed for electrical enclosures as they shall be rated NEMA 4X.
- I. All electrical enclosures shall be UL-listed, rated NEMA 4x (IP65) and sized suitably for the intended use. They shall be 304 SS suitable for being located local to the channel in an outdoor environment.
- J. Control Panels, Enclosures, and Cabinets
 - 1. The following paragraphs describe general fabrication requirements of control panels, enclosures, consoles and cabinets. All control panel assemblies shall be UL listed and fabricated in accordance with National Electric Code, Article 409 – Industrial Control Panels. The Seller shall be responsible for ensuring final enclosure sizing and panel arrangements accommodate all required equipment for a fully integrated and operational system as specified herein.
 - 2. Wiring

- a. All interconnecting wiring shall be of annealed, 98 percent conductivity, soft drawn copper and have 600-volt insulation and be rated for not less than 90 degrees Celsius.
- b. Power distribution wiring on the line side of fuses shall be 12 AWG minimum. Control wiring on the secondary side of fuses shall be 16 AWG minimum. Electronic analog circuits shall utilize 18 AWG shielded, twisted pair, cable insulated for not less than 600 volts.
- c. Power and low voltage DC wiring systems shall be routed in separate wireways. Crossing of power and low voltage wires shall be at right angles. Power and low voltage wires routed parallel to each other shall be separated by at least 6-inches. Wiring troughs shall not be filled to more than 60 percent visible fill. Provide separate wireways for both field and panel wiring.
- d. All wiring shall terminate in a master terminal board, where each terminal is uniquely and sequentially numbered. Direct interlock wiring between equipment will not be allowed. The master terminal board shall have a minimum of 25 percent spares. Terminal blocks shall be arranged in vertical rows and separated into groups (power, AC control, DC signal). Terminal blocks shall be the compression type.
 - 1) Discrete inputs and outputs (DI and DO) shall have two terminals per point with adjacent terminal assignments. All active and spare points shall be wired to terminal blocks.
 - 2) Analog inputs/outputs (AI and AO) shall have three terminals per shielded pair connection with adjacent terminal assignments for each point. The third terminal is for shielded ground connection for cable pairs. Ground the shielded signal cable at the PLC cabinet for all analog signals that are sourced at the panel. All active and spare points shall be wired to terminal blocks. Provide surge arrestors for Analog I/O which may also serve as the I/O blocks.
 - 3) Terminal blocks for analog circuits shall have test terminals and bypasses for testing and troubleshooting.
 - 4) Wire and tube markers shall be the sleeve type with heat impressed letters and numbers.
 - 5) Only one side of a terminal block row shall be used for internal wiring. The field wiring side of the terminal shall not be within 6-inches of the side panel or adjacent terminal or within 12-inches of the bottom of the panel.
 - 6) Terminal blocks shall be single-tiered and have permanent labels indicating the terminal block numbers.

- e. All wiring to hand switches, etc., which are live circuits independent of the panel's normal circuit breaker protection shall be clearly identified as such.
- f. All wiring shall be clearly tagged on both ends and color coded. All tag numbers and color coding shall correspond to the panel wiring diagrams and loop drawings. All power wiring, control wiring, grounding and DC wiring shall utilize different color insulation for each wiring system used. The color coding scheme shall be:
 - 1) Incoming 120 VAC Hot - Black
 - 2) 120 VAC Hot wiring downstream of panel circuit breaker - Red
 - 3) 120 VAC neutral - White
 - 4) Ground - Green
 - 5) DC wiring - Blue
 - 6) Foreign voltage - Yellow
- 3. Each field instrument shall have a separate power distribution circuit with circuit breaker or fuse with a blown fuse indication. Provide 24 VDC power supplies as required to power field instruments and panel devices.
- 4. Circuit power from the control cabinet out to field devices (switches etc.) that are used as discrete inputs to the PLC input cards shall be isolated with an isolating switch terminal block with flip cover that is supplied with a dummy fuse. Isolation switch block shall be an Allen Bradley, Square D, Phoenix Contact or equal.
- 5. All PLC outputs to the field shall be isolated with an isolating fuse switch terminal block with a flip cover and a neon blown fuse indicator. The single circuit fusible terminal block shall be an Allen Bradley, Square D, Phoenix Contact or equal.
- 6. Provide individual surge device protection for any 4-20 mA signal and 120VAC power to an instrument or equipment mounted outside of the building or facility housing. Instruments shall be housed in a grounded metallic case. Device surge protectors shall be mounted within the instrument enclosure or a separate junction box coupled to the enclosure. Provide gas tube or metal oxide varistors (MOVs) surge protection.
- 7. Equipment Mounting/Arrangement
 - a. All components shall be mounted in a manner that shall permit servicing, adjustment, testing and removal without disconnecting, moving or removing any other component. Components mounted on the inside of panels shall be mounted on removable plates and not directly to the enclosure. Mounting shall be rigid and stable unless shock mounting is required otherwise by the manufacturer to protect equipment from

vibration. Components mounting shall be oriented in accordance with the internal components and shall be identified with suitable plastic or metal engraved tags attached with drive pins adjacent to (not on) each component identifying the component in accordance with the drawing, specifications and vendor's data.

- b. All exterior panel mounted equipment shall be installed with suitable gaskets, faceplates, etc, required to maintain the NEMA rating of the panel.
- c. Use ISA Recommended Practice RP60.3 as a guide in layout and arrangement of panels and panel mounted components.

8. Nameplates

- a. All panels and panel devices shall be supplied with suitable nameplates, which identify the panel and individual devices as required. Each device nameplate shall include up to three lines with the first line containing the device tag number, the second line containing a functional description (e.g., Module No. 1), and the third line containing a functional control description (e.g., Start).
- b. Nameplates shall be 3/32 inch thick, black and white, Lamacoid with engraved inscriptions. The letters shall be black against a white background. Edges of the nameplates shall be beveled and smooth. Nameplates with chipped or rough edges will not be acceptable. Nameplates shall be affixed to the panels using 4-40 thread stainless steel button head hex screws.

9. Control Panels or Computer Consoles

- a. Control panels and computer consoles shall be of NEMA Type 4X stainless steel construction and shall be labeled by Underwriters Laboratories. The panels shall be constructed of 12 gauge thick 304 Stainless steel, suitably braced internally for structural rigidity and strength. All exposed welds, seams, or edges shall be ground smooth. Front panels or panels containing instruments shall be reinforced to prevent warping or distortion.
- b. Panels shall be provided with front access doors only as shown on the panel details. Front access doors with mounted instruments, control devices or operating interface terminals shall be of sufficient width to permit door opening without interference from flush mounted instruments or terminals. All doors shall be mounted with strong, continuous, stainless steel piano type hinges and be provided with lockable door handles and three point latches.
- c. Provide overhead switched lighting in each panel.

- d. The panel shall be suitable for top or bottom conduit entry as approved by the Engineer. For top mounted conduit entry the panel top shall be provided with nominal one foot square conduit entry area which may be drilled to accommodate conduit and cable penetrations. All conduit and cable penetrations shall be provided with ground bushings, hubs, gasketed locknuts, or other accessories as required maintaining the NEMA rating of the panel and electrical rating of the conduit system.
 - e. Low voltage (less than 120 VAC or DC) digital or 4-20 mA DC analog control devices and circuits or PLC components shall be compartmentalized with full height isolation barriers between the low voltage and 480 volt power devices within the panel.
10. Additional heating, cooling, dehumidifying, and filtering devices shall be incorporated in control panels, enclosures, and cabinets as required maintaining internal ambient conditions within the equipment's environmental operating range without violating the cabinet's NEMA rating. Minimum cabinet temperature shall not drop below 45 degrees Fahrenheit or exceed 104 degrees Fahrenheit under any conditions that have a UPS located in that cabinet.
11. Each control enclosure assembly shall be provided with corrosion inhibitors to protect interior electrical components from damage caused by high humidity. The corrosion inhibitors shall be installed prior to shipment to provide protection during shipment and storage of the enclosure. The corrosion inhibitor shall be Hoffman AHC15E or equal.

K. Managed Ethernet Switches

- 1. Ethernet switch(s) shall be a managed switch. The switch shall have the following physical features
 - a. Copper ports: 10/100 TX RJ45 ports, minimum 2 spare ports
 - b. Operating temperature: -10°C to 70°C
 - c. Power: 24 VDC redundant power supply inputs
 - d. Enclosure: DIN-rail mountable
- 2. The switch shall have the following features
 - a. Full duplex on all port
 - b. Auto negotiation and manual configurable speed and duplex
 - c. Wire speed switching fabric
 - d. IEEE 802.1w RSTP
 - e. IGMP snooping
 - f. IGMP filtering

- g. Configuration password protected
 - h. Configuration backup capability required
 - i. SNMP V3
 - j. Lock port function for blocking unauthorized access based on MAC address.
3. The switch shall have the following additional features
- a. The converter shall come equipped with a dry contact rated for 120 VAC 5A that shall be used for common trouble alarm. The alarm shall be programmable. If the contact cannot use 120 VAC 5A, provide the necessary 24 VDC power from the PLC panel and provide interposing relays in the PLC panel.
4. Switches installed in the Plant Network shall match manufacturer and series of plant switches provided elsewhere in this project.
5. Acceptable Manufacturers
- 1) Moxa
 - 2) N-Tron
 - 3) Allen-Bradley
 - 4) Or equal

2.12 POWER DISTRIBUTION CENTERS:

- A. Separate PDCs shall be provided for each UV channel, designed and sized to handle the loads for that channel's UV lamps. Channel power supply shall be independent, such that the failure of a PDC will only effect a single channel's UV equipment/modules. Interconnecting cables shall be standard 120 volt, weatherproof, minimum 10 feet long, or longer as required by the Seller's proposed equipment and layout.
- B. Each UV lamp module shall be protected by a thermal magnetic circuit breaker device per NEC Code mounted in the Power Distribution Center. Each circuit breaker shall provide visual trip indication and be capable of regular testing. To ensure safe operation, ground fault circuit detection systems, which permit remote reset, shall not be used.
- C. The electronic ballast enclosure shall contain the electronic ballasts and addressable lamp status monitoring systems. The ballast enclosure shall be 316 stainless steel and separate from the module.
- D. Each PDC shall include a transient voltage surge suppression (TVSS) on the incoming line. TVSS shall be heavy duty including lightning arrestors, surge capacitors and EMI/RFI noise filtering. TVSS for the PDC shall be 480V, three phase, 3 wire (or as required to protect the main incoming panel power) and have a minimum of a

100kA crest surge current rating. Units shall be provided with blown fuse indicator lights and integral disconnect switch. TVSS shall be UL listed.

- E. In the event of a failure or interruption of operation of the SSC, each PDC shall continue to operate in local mode and provide the designed disinfection performance.

2.13 SYSTEM CONTROL CENTER:

A. Control Sequence:

1. Select alternate banks if a selected bank is out of service, has a major alarm or is scheduled for maintenance.
2. Optimize lamp life by alternating banks.
3. The SCC shall be programmed to facilitate transitioning which channel(s) are online without loss of disinfection..
4. Protect lamps from cycling on/off by introducing delays to compensate for brief flow fluctuations and to keep energized banks in service for a user defined period of time (30 minutes minimum) and be designed to limit on/off cycling of the UV lamps.
5. The UV system shall be programmed to operate on a lead, lag(s), standby basis with the lead module or lead row of bulbs (as recommended by the manufacturer based on manufacturers design) being automatically switched every 7 days or as needed to ensure no lapse in disinfection. Operator shall have the ability to manually adjust lead, lag(s) and standby.
6. The dose pacing control scheme is enabled from the Operator Interface when the minimum number of PDCs are in Remote mode. Dose is calculated on a per bank basis and is totalled for the system. The total dose received by the effluent is called the Received Dose. This value is the Process Variable (PV) and the control system compares the PV to the Applied Dose (Set point) and adjusts the Ballast Output Current accordingly so that the Received Dose follows the Applied Dose. The control system shall energize and de-energize banks and channels as necessary to ensure the Received Dose follows the Applied Dose, without excessive cycling of the loadings; thereby maximizing lamp life and minimizing power consumption.
7. For a single module/bank system in Remote mode and with dose pacing enabled, the Ballast Output Current shall be adjusted such that the Received Dose follows the Applied Dose. If dose pacing is not enabled, the Ballast Output Current shall be varied proportionately to the effluent flow (based on flow signals provided).
8. For a two module/bank system in Remote mode and with dose pacing enabled, the output of the lead bank shall be adjusted such that the Received Dose follows the Applied Dose. If the Received Dose cannot attain the Applied Dose then the lag bank shall be energized and after the warm-up period the Bank Output Current of both banks shall be adjusted such that the Received Dose follows the

Applied Dose. The reverse shall also be true; if the Received Dose is greater than the Applied Dose then the lag bank shall be de-energized after a 30 minute delay.

9. In Remote mode the lead bank shall be always energized. The lag bank shall be energized under the following conditions:
 - a. if the Received Dose cannot attain the Applied Dose in dose pacing mode,
 - b. a major alarm condition is detected in the lead bank,
 - c. the operator manually rotates the lead bank.

The lag bank delay off timer shall be set to 30 minutes to prevent unnecessary on/off cycling based on changing process conditions.

- B. Color coding including panel lights and OIT displays shall be as directed by the PCSP. This following convention may change:

1. Amber Alarm
2. Red = Run, Open
3. Green = Off, Closed

- C. The SCC shall include, but not be limited to, the following:

1. Programmable Logic Controller (PLC): Allen-Bradley MicroLogix or CompactLogix.
2. I/O modules: As manufactured by Allen-Bradley.
3. Operator Interface Terminal (OIT): Allen Bradley Panelview Plus 7. Minimum 15" screen.
4. Provide transient voltage surge suppression (SPD) on the incoming line to the SCC. SPD shall be heavy duty including lightning arrestors, surge capacitors and EMI/RFI noise filtering. SPD for the CMFCP shall be 480, three phase, 3 wire (or as required to protect the main incoming panel power) and have a 100kA crest surge current rating. Units shall be provided with blown fuse indicator lights and disconnect switch. SPD shall be UL listed.
5. Provide Uninterruptible Power Supply (UPS): The UPS shall be sized by the Seller to provide power to the vendor PLC, OIT, DC power supplies and all instruments connected to the SCC. All ancillary equipment within the SCC (e.g. lights, power receptacles, heating, cooling) shall not be powered from the UPS. The UPS shall be double conversion online with true sine wave output providing 20 minutes of backup power at half load. The UPS shall have an internal automatic static bypass switch such that an overload condition shall transfer load to incoming line power. An external maintenance (make-before-break) bypass switch shall be installed in order to service the UPS without losing power to the control panel components. The following UPS status/alarms shall be wired to the PLC and transmitted to the SCADA system, external maintenance

bypass status, static bypass status, common alarm, power failure. The UPS shall operate properly in an ambient temperature of 0 to 40 °C. The UPS shall be Sola Hevi-Duty, American Power Conversion or equal.

6. All necessary ancillary devices (managed Ethernet switches, hardware, drivers, software, etc.) needed for communication to be established from the SCC to the plant SCADA system over the Plant's SCADA Ethernet TCP/IP protocol based Plant Network shall be included.
7. Hardwired I/O Points (and related control logic and status screen displays) to interface with the following systems not provided within this scope of supply:
 - a. Provide Form C normally open (NO), normally closed (NC) dry contacts rated for a minimum of 2 amps at 120 volts for the following (Discrete Outputs):
 - 1) Minor common alarm condition
 - 2) Major common alarm condition
 - 3) Bank status (one for each UV bank supplied)
 - 4) PLC power failure
 - 5) Low UV intensity alarm
8. Other signals (and related control logic and status screen displays as discussed below) derived from the ethernet based Plant Network:
 - a. Flow through the UV system shall be user selectable (Manually Select at the OIT one of the following):
 - 1) Plant Influent Flow (calculated as the sum of the flow signals received for two influent Parshall flumes)
 - 2) Intermediate Pump Station flow (the flow signal received from the intermediate pump station magnetic flow meter)
 - 3) The larger of the above two flows

D. Functionality:

1. Provide local indication of the following system parameters:
 - a. Individual lamp status, hours, cycles
 - b. Communications status
 - c. Bank UV intensity (mJ/cm²)
 - d. Bank ON/OFF status
 - e. Bank elapsed time (h)
 - f. Cleaning motor status

- g. Bank lamp current (%)
 - h. Time before next cleaning cycle (h)
2. The OIT shall be programmed to record and display trending of system signals. It shall be capable of displaying signal trends at least the past 3 months.
 3. It shall be possible to set the status of individual banks to either manual, off or automatic mode from the System Control Center.
 4. PLC program shall have variables assigned (tags) for all parameters and shall be capable of being monitored by the plant SCADA system.
 5. Lamp cycles and hours (and bank elapsed time, if recommended by the manufacturer) shall be reset via a password protected screen.
 6. Excessive lamp on/off cycling shall be protected against by introducing delays to compensate for brief flow fluctuations and to keep energized banks in service for a defined period of time.
 7. Record and when prompted display through the OIT recent alarms (or critical alarms as requested by the Owner) and alarm history register. Alarms shall be generated to notify operations that maintenance attention is required or there is an extreme condition in which the performance may be jeopardized. Coordinate with the Owner regarding the priority of these various alarms and those alarms that must be “called out”. Provide a temporary discrete alarm output contact (for remote ‘call out” by others) until such time that the system is fully integrated with the SCADA system at which time the SCADA system shall be responsible for “call out” of the alarms.
 8. Minor alarms shall be provided to indicate to plant operators that maintenance attention is required. Alarms shall include:
 - a. Individual lamp/ballast failure shall indicate which lamps are out of service (locally only).
 - b. Cleaning motor overload/cleaning system failure.
 - c. Bank Low UV intensity alarm. This alarm set point shall be field adjustable.
 - d. High cabinet temperature alarm.
 9. Major alarms shall be provided to indicate an extreme alarm condition in which the disinfection performance may be jeopardized. Alarms shall include:
 - a. Low-low UV intensity alarm. This alarm set point shall be field adjustable.
 - b. Adjacent Lamp Failure.
 - c. Multiple Lamp Failure.

- d. Circuit breaker/GFI trip alarm.
- e. Effluent low level.
- f. Loss of UV intensity signal in Remote mode.
- g. Loss of flow signal in Remote mode.
- h. Bank UV intensity low-low alarm

10. Alarms - General

- a. The alarm display shall identify the affected module and then the actual component.
- b. The 100 most recent active, acknowledged, or corrected alarms shall be recorded in an alarm history register and displayed when prompted. The alarms displayed shall include, but not be limited to, minor and major alarms as defined below.

11. Interface with the plant's SCADA system in a manner that allows all alarms, setpoints, monitoring, and control functionality available at the OIT to also be available through the SCADA system. This shall be based on a high speed Ethernet TCP/IP based connection to the plant SCADA system. The Seller shall be responsible for coordinating with the Construction Contractor and the Plant Control System Programmer (PCSP) during construction. Prior to leaving the site, the Seller shall verify that the PLC and OIT and other addresses ("IP addresses") are configured to be compatible with the plant's SCADA system.

12. Interface with other Allen Bradley PLCs connected to the plant's SCADA system in a manner that critical data in the System to be relayed to the other PLCs. This will be based on a high speed Ethernet TCP/IP based connection to the plant SCADA system. The Seller shall be responsible for coordinating with the Construction Contractor and the Plant Control System Programmer (PCSP) during construction. Prior to leaving the site, the Seller shall verify that all message blocks are configured properly and are sized to include spares.

E. PLC Hardware Requirements

- 1. The PLC panel shall have at a minimum 10 percent active spares of each I/O type for future use. At a minimum, active spare I/O shall include all reserved I/O. In addition, each PLC rack shall include rack space for 10 percent I/O modules for future use. Active points shall be defined as points physically configured in the PLC, all wiring between the I/O module and terminal block complete, and sufficient power supply capacity available to immediately put a point into service by connecting the field wires at the terminal block.
- 2. All PLC discrete and relay outputs shall be individually fused. Fused terminal blocks shall be knife disconnect type.

3. Where multiple mechanical components are provided for process redundancy, their field connections to I/O modules shall be arranged such that a failure of a single I/O module will not disable all mechanical components of the redundant system.
4. Provide sufficient I/O for the proposed system functionality and control/monitoring of specified equipment to be provided under this specification. This list does not include tags that may be required to be sent over the ethernet based Plant Network.

2.14 POWER MONITOR

- A. Power monitor shall be factory installed in each UV Power Distribution Centers. Power monitor shall display three different values simultaneously (i.e. Voltage A-B, B-C, and A-C).
- B. Monitor shall be compatible with the 480V, 3-phase system and rated for equipment's current rating.
- C. Direct connect inputs up to 600 V ac line-to-line.
- D. Metered Values and Accuracies shall meet or exceed the following:
 1. AC Ampere – Phases (3): +/- 0.5% Accuracy
 2. AC Voltage – Phase to Phase (3): +/- 0.5% Accuracy
 3. Watts, VARs, and VAs: +/- 0.2% Accuracy
 4. System and Per Phase Watthours, Varhours and VA-Hours: +/- 1.0% Accuracy
 5. Apparent and Displacement Power Factor: +/- 1.0% Accuracy
 6. %THD (distorted currents and voltages up to 40th harmonic): +/- 1.0% Accuracy
- E. Power monitors shall have large, easy to read, three-line LED displays with navigation buttons and multilingual operation menu.
- F. Communication:
 1. Power monitor system shall communication using an Ethernet Connection.
 2. Outputs: In addition to the Ethernet communication, the power monitor shall have at least (2) 4-20mA programmable outputs available.
- G. Manufacturer:
 1. Eaton IQ 260 with Ethernet connection
 2. Equivalent by Square D
 3. Or equal

2.15 UV TRANSMITTANCE MONITOR

- A. UV Transmittance Monitor (Portable): one (1) Portable UV Transmittance Monitor, 1 minute warm-up time, 254nm wavelength UV light source, with either UV Transmittance or UV Absorbance values, user interface, and built-in fault monitor. Provide monitor from Chemtrac (UV1000), HF Scientific (UVT-15 UV Photometer) or equal.

2.16 UV INTENSITY SENSOR

- A. A submersible UV intensity sensor shall continuously monitor the UV intensity produced in each bank of UV lamp modules. The sensor shall measure only the germicidal portion of the light emitted by the UV lamps. The detection system shall be calibrated in the factory. Detection systems which can be field calibrated shall not be permitted.

2.17 OPERATOR'S KIT

- A. Two (2) face shields which blocks UV light wavelengths between 200 and 400 nm.
- B. Four (4) - UV warning labels

2.18 CLEANING EQUIPMENT

- A. General
 - 1. Provide mechanical and chemical cleaning systems with the UV system as specified below. System that do not include both mechanical and chemical cleaning systems shall not be considered.
- B. Mechanical Cleaning System
 - 1. Provide a mechanical cleaning system with a cleaning cycle that can be automatically or manually initiated. UV systems that do not have automatic cleaning are not acceptable.
 - 2. The cleaning mechanism (wipers) shall be driven by an electric motor or a hydraulic system.
 - 3. Cleaning mechanism shall be constructed of UV resistant materials.
 - 4. The wipers shall be designed to remove the deposit and for easy replacement in the field.
 - 5. The cleaning system shall be fully operational without requiring the lamp rack to be taken out of service.
 - 6. The cleaning system shall be fully operational without requiring the lamp rack to be in service. (Automatic and regular cleaning shall be possible even when the UV system is not disinfecting, during the disinfection off season.)
 - 7. The automatic cleaning cycle intervals shall be field adjustable from once every hour to once every 999 hours.

C. Chemical Cleaning System

1. In addition to the automatic mechanical cleaning system, the UV system shall be capable of being cleaned chemically, either by in-place chemical cleaning or out of channel (whereby the modules or a bank of modules are periodically removed from the channel to a cleaning tank sized to fit the modules) for chemical cleaning.
2. Provide all equipment required to chemically clean the modules/sleeves, either in place or out of channel.
3. Equipment for out of channel chemical cleaning shall include hoists, cleaning tank liner, drain connection, cleaning tank agitation system, and air compressors. (if air compressors are required, they will be housed in the nearby Filter Building. Interconnecting piping for air compressors is not within the Seller's scope of supply).
4. Due to the topography of the WPCF, draining of the chemical cleaning tank by gravity is not feasible. If a chemical cleaning tank is required, provide a portable drain pump (120 volt operated with 10 foot power cable) and discharge hose 10 feet long that is capable of draining the chemical cleaning tank in 15 minutes. Drain pump shall be compatible with cleaning chemicals. Drain pump shall be capable of being submerged or running dry without damage. Drain pump motor shall be non-overloading over the entire range of the pump. Drain pump and hose will discharge to drain pipe at an elevation no more than 3 feet above the top of the cleaning tank and which discharges to the nearest sewer line. The drain pipe will be provided by the Buyer. Drain pump shall be manually operated.
5. If a cleaning tank is required, cleaning tank shall be adequately stiffened to resist buckling and provided with a bottom flange or bracket to facilitate tiedown during concrete placement.

PART 3 EXECUTION**3.1 GENERAL**

- A. Buyer shall unload and thoroughly inspect Goods upon arrival at the project site and report observed damage immediately to the Seller and Engineer in writing. Seller shall repair to as-new condition or replace damaged goods at no additional cost. Perform Engineer approved repair work by a factory-trained technician associated with the Seller.
- B. Seller shall provide a representative to attend a minimum of one pre-installation meetings with the Owner, Buyer and Engineer to review general procedures, erection and installation instructions, and installation sequence.
- C. Buyer shall install Goods in accordance with Seller's shop drawings, instructions and recommendations, as well as drawings and specifications for the Construction Contractor's Contract Drawings.

- D. Buyer shall provide finish painting of items with a shop prime coat, provide touch-up painting of those areas damaged during installation.
- E. Seller shall provide a representative to inspect and verify in writing that the installation of the Goods are in accordance with Seller's shop drawings, instructions and recommendations, as well as drawings and specifications for the Construction Contractor's Contract Drawings. Report deviations to the Owner, Buyer and Engineer in writing. Buyer to coordinate the schedule of this inspection with the Seller so that the inspection and needed corrective actions are completed prior to Buyer proceeding with testing activities.
- F. Buyer shall provide and coordinate the on-site assistance and coordination necessary for the Seller to complete the various inspections and various testing requirements specified in this section and make adjustments, repairs, or replacements required to make the system pass all testing requirements.
- G. Until such time at the installation of the Goods is complete and performance testing of the installed Goods is successfully completed, the responsibility of costs associated with operating the Goods shall be as follows:
 - 1. Electrical Power – Owner
 - 2. Cleaning Chemicals – Seller
 - 3. Plant Water – Buyer

3.2 SELLER'S FIELD SERVICES

- A. Installation, Commissioning, and Startup
 - 1. Provide the services of a Seller's representative who is experienced in the installation, adjustment, and operation of the System.
 - 2. Provide the services of a Seller's representative as necessary to inspect the installation, and to supervise the commissioning and startup of the System, but this shall be no less than five (5) days spanning a minimum of three separate trips. Days shall be 8-hours on-site and be exclusive of travel time.
- B. Training
 - 1. Training shall be scheduled after copies of operation and maintenance manuals specified in Section 01770 have been delivered and be scheduled at least 10 days in advance with the Owner.
 - 2. Provide the services of a factory-trained representative to train the Owner on the operation and maintenance of equipment supplied under this Section in accordance with the requirements of Section 11000.
 - 3. Operator training shall include but not be limited to the care, operation and maintenance of all UV disinfection equipment as well as demonstration of the maintenance activities and training operators to change bulbs and other system

devices to the point where they can perform in accordance with the timeframes guaranteed in the Seller's Bid.

4. Provide a minimum of 16 hours of training consisting of four sessions, each session being four hours long. Each session must be on separate days, and sessions shall not be on consecutive days.

C. Refresher Training

1. Provide the services of a factory-trained representative for refresher training, inspection of the equipment, and UV disinfection system optimization (including additional calibration, tuning and programming modifications).
2. Refresher Training shall be provided after six (6) months of operation but not more than one (1) year after testing and the successful completion of the Performance Demonstration of the UV equipment
3. Provide a minimum of 8-hours on-site on one day with 4 hours for training and 4 hours for optimization.

D. Performance Demonstration Testing

1. Provide services required to complete the testing as described herein.

- E. The actual number of days on site shall be increased above the minimum specified as necessary, without additional cost to the Owner, as necessary to comply with this specification.

3.3 INSTALLATION, COMMISSIONING, AND STARTUP

A. Work Restrictions

1. The Buyer will not be allowed to start construction of the second UV channel until such time that the first channel is installed, commissioned, started up, operating, and performance tested (regardless of the time of year, the status of completion of the Cloth Media Filter, or the operation of the Zimpro PACT-WAR system).
2. Complete the performance test of the second UV channel only after the Cloth Media filter and intermediate pump station have been completed.
3. Although energy usage will be measured during both performance tests, the Seller's Operations and Maintenance guaranteed values (and O&M Performance Penalty if appropriate) will not be evaluated during the performance test on the first UV channel.

B. Installation:

1. Prior to commissioning or startup of each UV channel, the Seller, with the assistance of the Buyer, shall inspect all equipment for proper installation, assembly, wiring (including, lamps, modules, Power Distribution Center, system control centers and accessories), leveling, and alignment. Inspection

including deficiencies shall be documented in a written report by the Seller's representative and provided to the Owner.

2. Deficiencies, if identified, must be corrected prior to commissioning and startup. Complete and provide the Owner with a copy of an installation report specifying that the equipment has been installed according to the Seller's recommendations and is ready for commissioning, startup, and testing. The report shall also certify that the installation is correct and that the system as installed meets all requirements and that nothing in the installation will render the manufacturer's warranty null and void.

C. Commissioning:

1. The proposed field commissioning procedures for each channel shall be developed by the Seller and submitted to the Engineer for review at least 60 days prior to scheduling and performing field commissioning.
2. After the equipment installation for each channel has been verified, the equipment shall be commissioned by a factory-trained, experienced manufacturer's technician in the presence of the Engineer.
3. The commissioning activities shall verify the system operation, control functions, and demonstrate the systems fitness for the service specified and, to the extent possible, the ability of the units to meet the specified performance requirements.
4. Confirm field instruments are properly installed and field calibrated by the Seller's representative.
5. At completion of commissioning, provide Seller's certificate indicating equipment is properly installed and fully functional. Provide data sheets with report indicating all field calibrated parameters.

D. Startup:

1. Startup shall be completed after all components in the channel being started up operate without alarms or shut downs, except as intended, for 48 consecutive hours to confirm mechanical and electrical operation.
2. During startup, operate the equipment through the design performance range. Adjust, balance, and calibrate and verify that the equipment, safety devices, controls, and process system operate within the design conditions. Response shall be checked for each equipment item and alarm.
3. Startup testing of the second UV channel shall include simulating a high influent flow rate and automatic startup of the offline channel. This simulation shall be conducted twice: once for each channel.

- E. A copy of information from functional tests, including data, worksheets, and other materials shall be turned over to the Buyer at the completion of the commissioning

program. PLC source code updates shall be provided at the completion of performance demonstration testing.

- F. All adjustments necessary to place the equipment in satisfactory working order shall be made at the time of the above tests, at no additional expense.
- G. The performance demonstration shall not be performed until, in the opinion of the Engineer, the system meets the requirements of the specifications and startup is completed.

3.4 PERFORMANCE DEMONSTRATION TESTING

- A. For each channel conduct a two-day continuous performance demonstration test to verify that the UV disinfection system can meet Performance Requirements in Paragraph 1.9.B. of this specification and the Performance Guarantees and guaranteed Operations and Maintenance criteria provided by the Seller on the Bid Form 00410 (Section 5.3.B.). See Paragraph 3.3 A.1 for timing of the performance tests.
- B. Each day of the performance demonstration test, the Seller shall be responsible for the collection and analysis of 10 sets of samples at 1 hour intervals in order to make the following determinations. The first set of samples and measurements shall be taken 2 hours after the beginning of the test run and no later than 9:00 AM each day. Data collection shall include the following at a minimum:
 - 1. Flow through the UV Disinfection System (MGD) – (collected and plotted continuously throughout the entire demonstration period)
 - 2. UV channel influent gate status (list times that gates were opened and closed)
 - 3. Total System Power Consumption (KW) – (collected and plotted continuously throughout the entire demonstration period)
 - 4. UV Intensity at each sensor - (collected and plotted continuously throughout the entire demonstration period)
 - 5. Sleeve Wipes – (count and frequency shall be throughout the entire demonstration period)
 - 6. Escherichia coli of the Influent to the UV Channels
 - 7. Total Suspended Solids of the Influent to the UV Channel
 - 8. Ultraviolet Transmittance within the UV Channel
 - 9. Temperature of the Influent to the UV Channel
 - 10. Ambient Air Temperature
 - 11. Escherichia coli of the Effluent from the UV Channels
 - 12. Data collection at the time of each sample
 - a. Number of lamps on-line

- b. Lamp power (0 to 100%)
- C. The Seller shall have the samples analyzed by an independent laboratory at their own expense. The proposed testing laboratory's procedures and dilution methods shall be provided to the Engineer for review two weeks prior to initiating the performance demonstration along with the Seller's demonstration schedule. Should the Seller fail the performance demonstration testing, all additional costs for retesting shall be paid for by the Seller at no additional cost to the Owner.
- D. Performance demonstration testing shall be conducted in the presence of the Buyer and Engineer to assure that the UV disinfection system operates satisfactorily and conforms to the specifications. A minimum of 7 days notification is required prior to demonstration.
- E. The performance demonstration testing shall include all Goods provided under this specification. Sequence the operation of all modules so that run time during performance testing is equalized among all modules.
- F. UV disinfection system performance shall be documented by obtaining concurrent reading showing supply voltage, amperage, as well as taking concurrent samples of the influent and effluent from the UV channels.
- G. The performance demonstration test shall show the system has been well tuned and performs as specified.
- H. During the performance demonstration test, if the influent conditions are significantly different from the specified design conditions, the Seller shall propose measures to simulate the design influent conditions. If required by the Engineer, the Seller's proposed measures shall be implemented by the Buyer to allow for proper testing.
- I. A log of the performance demonstration test shall be submitted to the Engineer upon completion of the demonstration documenting the results.
- J. For any equipment that does not satisfy the condition specified, the Buyer and Seller shall take corrective measures at no additional expense.

3.5 PERFORMANCE MONITORING TESTING

- A. The Owner will perform routine testing over a period of 12 months from the conclusion of the performance demonstration test to verify that the UV disinfection system continues to meet the performance criteria listed in the Paragraph 1.9 and all the Seller's guaranteed performance criteria provide on the bid form, Section 00410. If performance monitoring indicates that the system is not performing in accordance with the performance criteria, the equipment shall be repaired or replaced as per the Seller's Performance Guarantee.

3.6 SUBSTANTIAL COMPLETION AND FINAL ACCEPTANCE

- A. Substantial Completion shall be dependent upon the satisfactory operation of the UV equipment and the successful completion of the Performance Demonstration. Refer to Paragraphs 1.9 and 3.4 above in this Section.

- B. Final Acceptance shall be dependent upon the satisfactory operation of the UV equipment, the successful completion of the Performance Demonstration and the results of the performance over the first year of operation during the Performance Monitoring period. Refer to Paragraphs 1.9, 3.4 and 3.5 above in this Section.

END OF SECTION

J:\V\V0037 Vernon WWTP\05 - WPCF Design\Design\Specifications\Preselection\UV\11262.doc

APPENDIX A

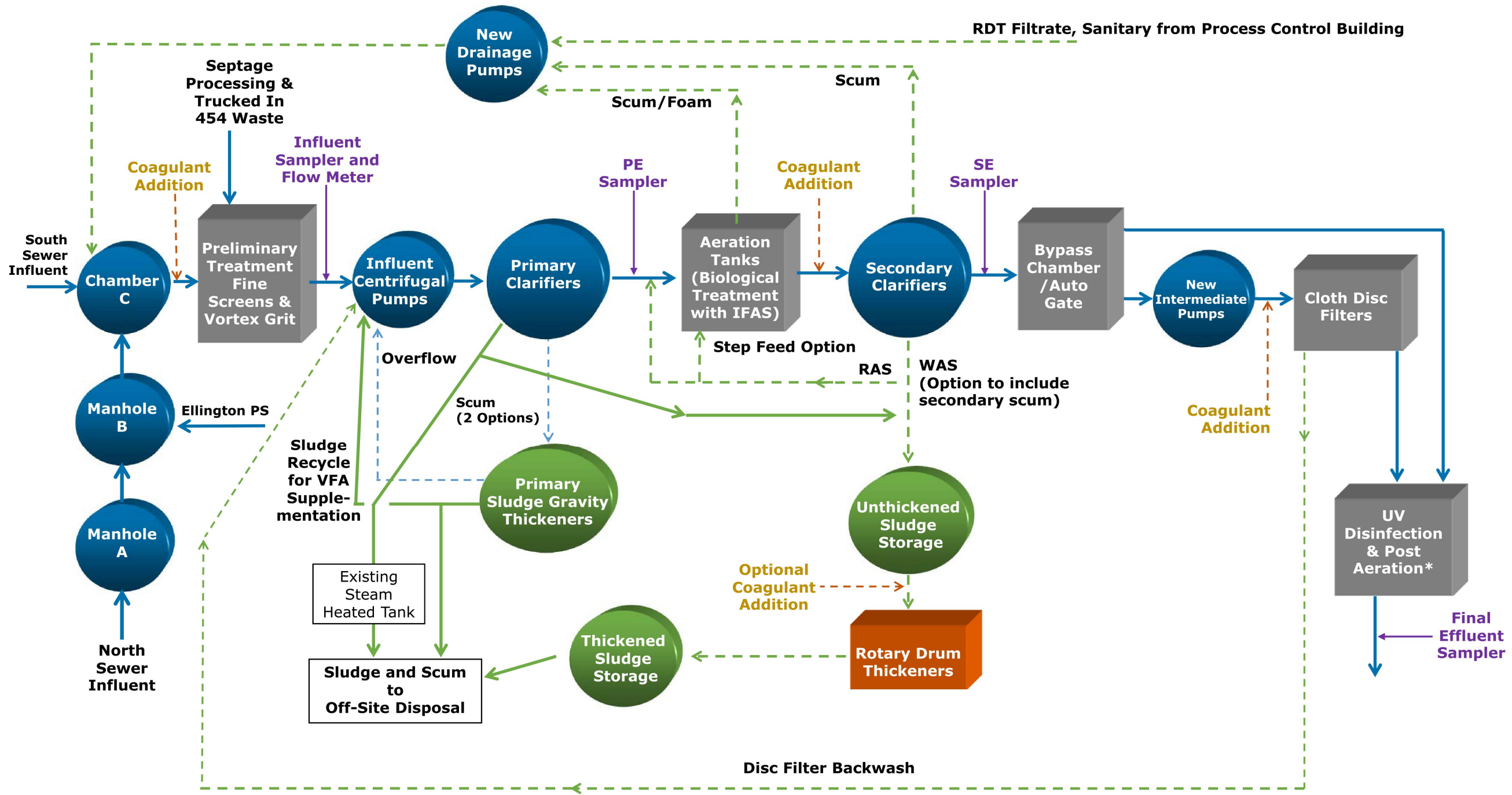
Drawings



Town of Vernon,
Connecticut

EXISTING PROCESS FLOW DIAGRAM

SCALE: NO SCALE



Equipment
Preselection

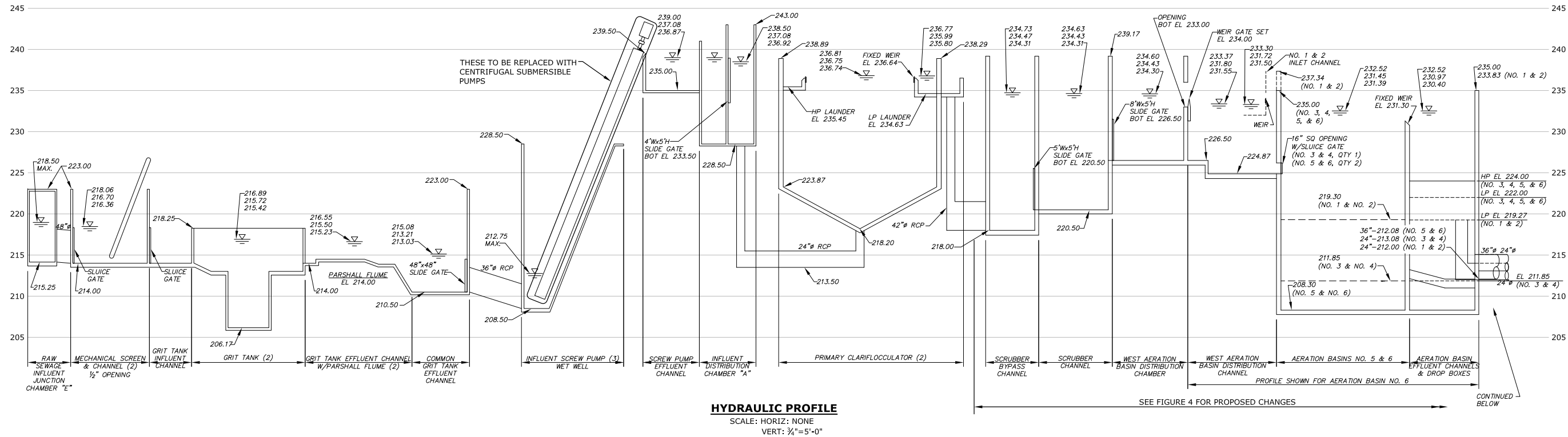
Town of Vernon,
Connecticut

MARK	DATE	DESCRIPTION
PROJECT NO:	V0037	
DATE:	SEPTEMBER 2017	
FILE:	V0037-05-Figures 1 and 2.dwg	
DRAWN BY:	ADW/FAM	
CHECKED:	IBC	
APPROVED:	SES	

PROPOSED PROCESS
FLOW DIAGRAM

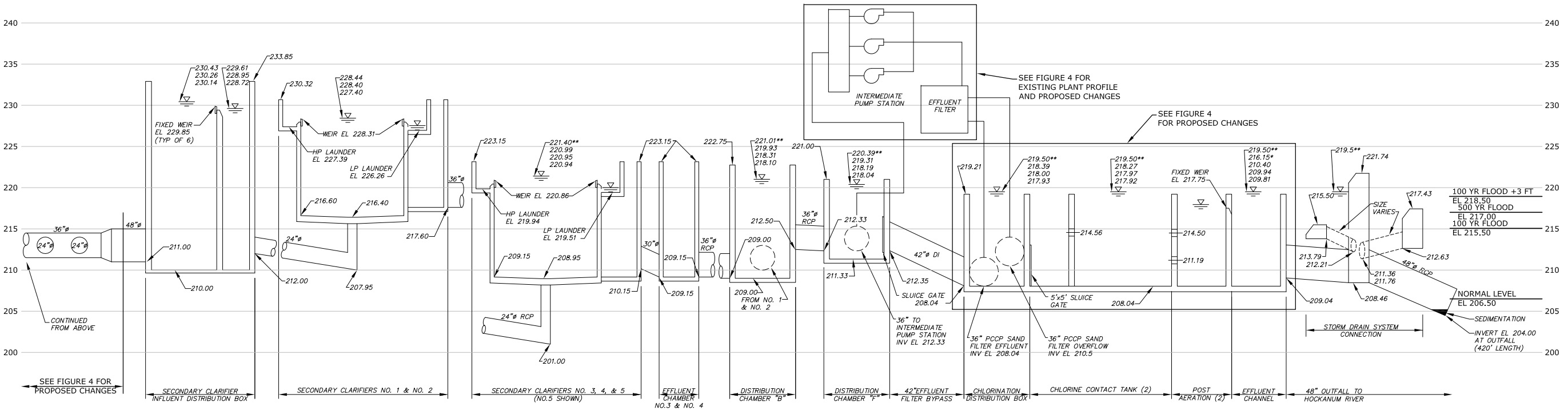
SCALE: NO SCALE

FIGURE 2



HYDRAULIC PROFILE

SCALE: HORIZ: NONE
VERT: 3/4"=5'-0"



HYDRAULIC PROFILE

SCALE: HORIZ: NONE
VERT: 3/4"=5'-0"

LEGEND

EL PEAK HOUR (*, ** SEE NOTES)
EL MAX DAY
EL AVERAGE DAY

BASIS OF EXISTING HYDRAULIC PROFILE

FLOW CONDITION	INFLUENT FLOW (MGD)	RETURN SLUDGE FLOW (MGD)	UNITS OUT OF SERVICE
PEAK HOUR	22.0	8.0	(1) SECONDARY CLARIFIER
MAXIMUM DAY	9.7	8.0	(1) SECONDARY CLARIFIER
AVERAGE DAY	7.1	3.5	(1) GRIT TANK, FLUME

- AN * INDICATES PEAK PROFILE CALCULATED FROM STARTING WATER SURFACE EL 215.50 IN THE HOCKANUM RIVER.
- AN ** INDICATES PEAK PROFILE CALCULATED FROM STARTING WATER SURFACE EL 218.50 IN HOCKANUM RIVER.
- ALL OTHER PROFILES CALCULATED FROM STARTING WATER SURFACE EL 206.50 IN THE HOCKANUM RIVER WITH 6.7 MGD OF FLOW FROM 25-YR STORM AND CCT OVERTOPPING.
- ALL PROFILES CALCULATED BYPASSING THE EFFLUENT SAND FILTERS.
- THE VERTICAL DATUM REFERENCES NGVD29.
- NUMBER OF UNITS FOR EACH PROCESS SHOWN IN PROFILE (#).

**Equipment
Preselection**

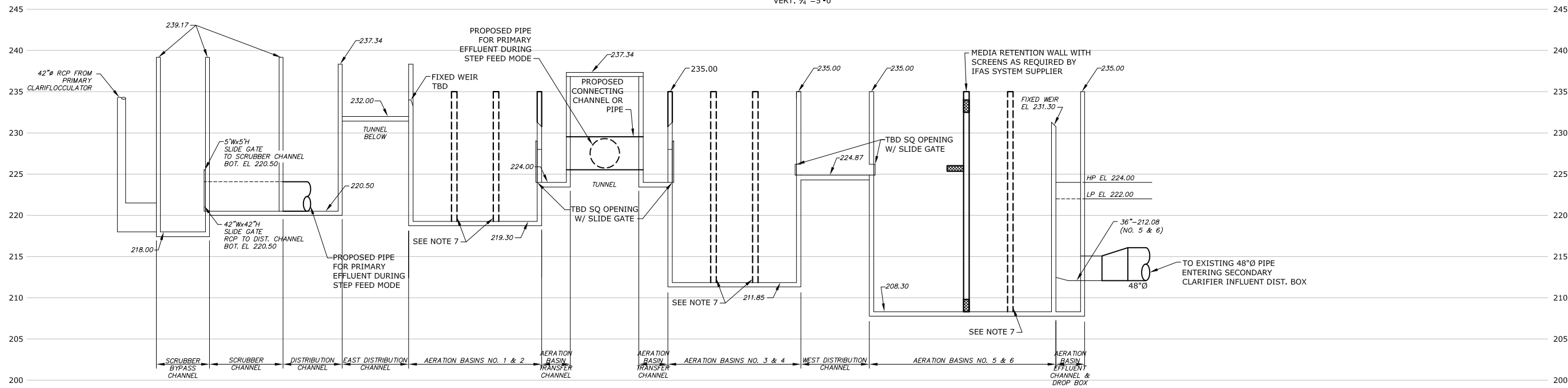
**Town of Vernon,
Connecticut**

MARK	DATE	DESCRIPTION
PROJECT NO:	V0037	
DATE:	SEPTEMBER 2017	
FILE:	V0037-Figure 3.dwg	
DRAWN BY:	REJ, AJS	
CHECKED:	SHB	
APPROVED:	FAM, SES	

**EXISTING PLANT
HYDRAULIC PROFILE**

SCALE: AS SHOWN

FIGURE 3
SHEET 1 OF 2



HYDRAULIC PROFILE
SCALE: HORIZ: NONE
VERT: 3/4"=5'-0"

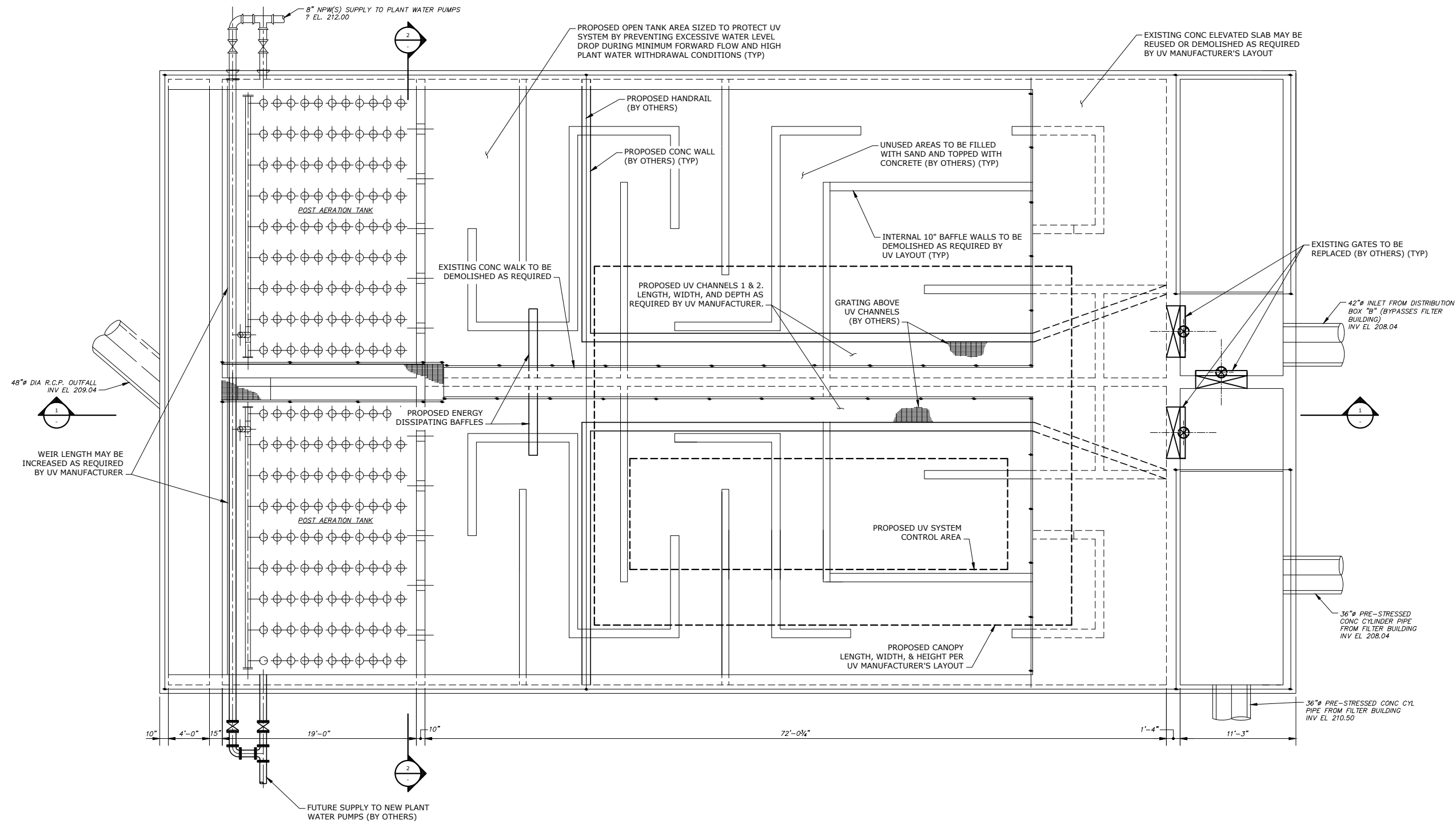
1. AN * INDICATES PEAK PROFILE CALCULATED FROM STARTING WATER SURFACE EL 215.50 IN THE HOCKANUM RIVER.
2. AN ** INDICATES PEAK PROFILE CALCULATED FROM STARTING WATER SURFACE EL 218.50 IN HOCKANUM RIVER.
3. ALL OTHER PROFILES CALCULATED FROM STARTING WATER SURFACE EL 206.50 IN THE HOCKANUM RIVER WITH 6.7 MGD OF FLOW FROM 25-YR STORM AND CCT OVERTOPPING.
4. ALL PROFILES EXCEPT INTERMEDIATE PUMP STATION AND FILTER BUILDING ARE CALCULATED BASED ON BYPASSING THE INTERMEDIATE PUMP STATION AND CLOTH MEDIA FILTERS.
5. THE VERTICAL DATUM REFERENCES NGVD29.
6. NUMBER OF UNITS FOR EACH PROCESS SHOWN IN PROFILE (#).
7. BAFFLES TO CREATE SELECTORS AND REQUIRED ZONES AS REQUIRED BY IFAS SYSTEM SUPPLIER (TYP) (NOT ALL ARE SHOWN).

Town of Vernon,
Connecticut

EXISTING PLANT AND
PROPOSED CHANGES
HYDRAULIC PROFILE

SCALE: AS SHOWN

FIGURE 4
SHEET 2 OF 2



Equipment Preselection

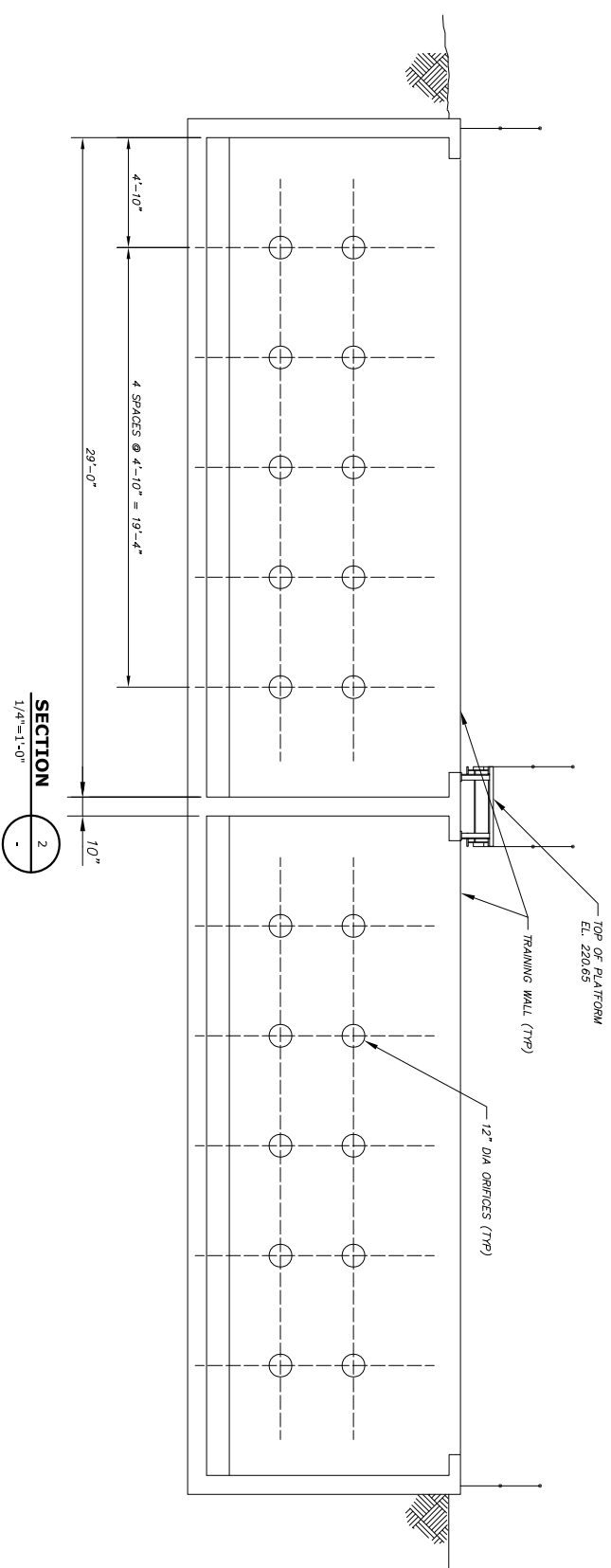
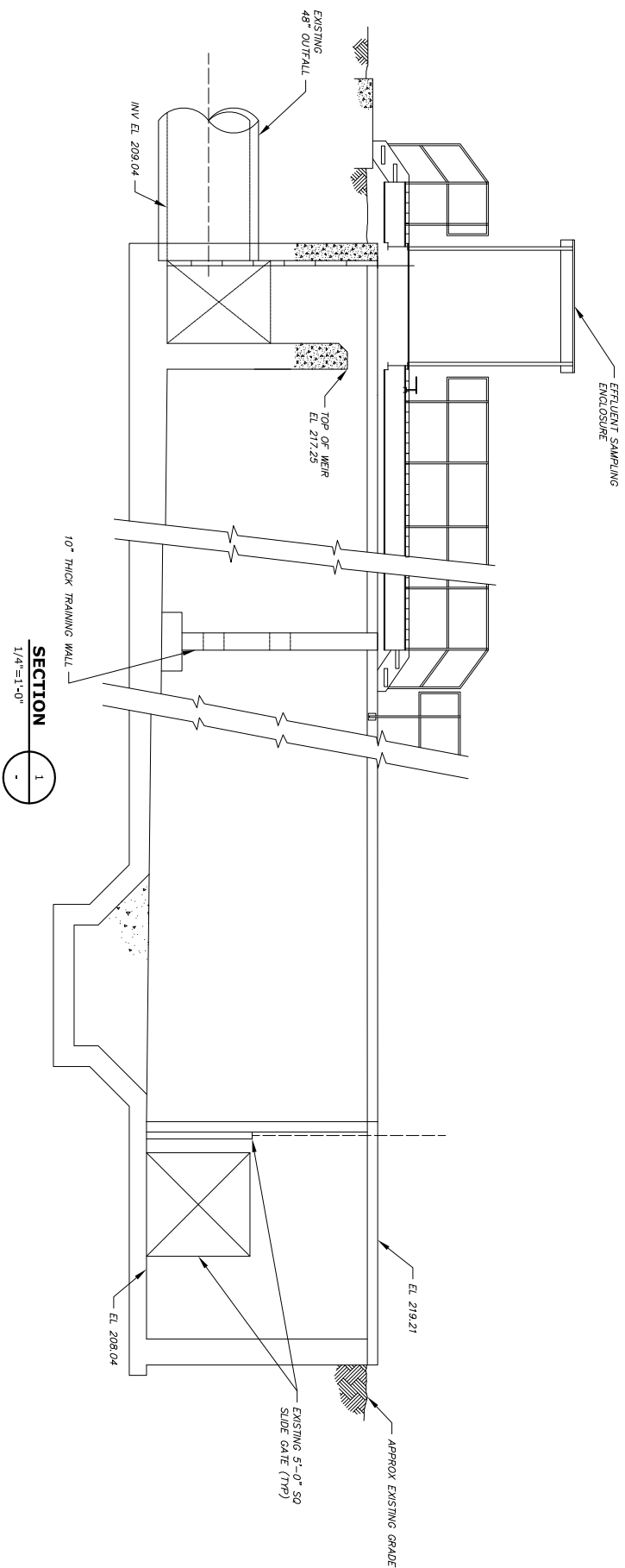
Town of Vernon,
Connecticut

MARK	DATE	DESCRIPTION
PROJECT NO:		V0037
DATE:		SEPTEMBER 2017
FILE:		V0037-05-UV System Plan.dwg
DRAWN BY:		AJS
CHECKED:		PAM
APPROVED:		FAM

UV SYSTEM PLAN

SCALE: 3/16"=1'-0"

FIGURE 5
SHEET 1 OF 1



Equipment Preselection

Town of Vernon,
Connecticut

[illegible]

UV SYSTEM SECTIONS

SCALE: 1/4"=1'-0"

FIGURE 6

APPENDIX B

Existing Plant Data

Note: The following data are excerpted from the existing WPCF historical data observed from September 1st, 2013 through August 31st, 2016. Data are provided for informational purposes only. Data shall not be used as design criteria and may not be representative of future conditions. Influent conditions include septage and recycle streams (filter backwash, WAR blowdown, and spent carbon thickener scum). Significant changes to the WPCF processes are proposed including changes to recycle flows that influence WPCF influent samples.

Date	Daily Flow			BOD (5-day)	Suspended Solids	pH	TKN	Total P	Temp.	Alkalinity
	Max.	Min.	Total	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Prim.
	mgd			mg/l	mg/l	S. U.	mg/l	mg/l	° F	Eff.
	Daily			Daily	Daily	Work Day	Weekly	Weekly	Work Day	Monthly
1/1/2013	5.52	1.15	3.62	34	5					
1/2/2013	6.70	1.18	2.93	520	497	7.60	40.20			54.8
1/3/2013	6.39	1.30	3.16	490	535	7.65				51.9
1/4/2013	5.27	1.23	3.16			7.57				55.3
1/5/2013	5.68	1.00	3.07							
1/6/2013	5.39	1.01	3.30							
1/7/2013	5.43	1.07	3.25	550	630	7.64				55.9
1/8/2013	4.95	1.20	3.42	360	437	7.44				55.7
1/9/2013	4.97	1.17	2.62	460	563	7.60				55.1
1/10/2013	5.26	1.11	3.02			7.55				55.7
1/11/2013	5.32	0.95	2.93			7.38				55.0
1/12/2013	5.60	1.10	3.11							
1/13/2013	5.80	1.03	3.32							
1/14/2013	5.09	1.13	3.38	330	389	7.65				56.2
1/15/2013	5.28	1.44	3.58	368	430	7.65				54.8
1/16/2013	5.68	1.38	3.46	440	598	7.59				54.7
1/17/2013	5.48	1.36	2.89			7.65				54.3
1/18/2013	5.18	1.17	3.33			7.42				55.3
1/19/2013	5.15	1.18	2.74							
1/20/2013	5.43	0.96	3.16							
1/21/2013	6.89	0.92	3.12							
1/22/2013	4.74	0.98	3.12	450	528	7.43				55.0
1/23/2013	4.67	1.05	3.11	293	309	7.45				52.5
1/24/2013	5.40	1.08	2.89	340	373	7.55				51.8
1/25/2013	7.48	1.02	2.69			7.62				51.8
1/26/2013	4.95	0.84	2.89							
1/27/2013	5.14	0.81	2.82							
1/28/2013	5.17	0.85	2.85	410	525	7.65				53.7
1/29/2013	5.50	0.86	2.98	420	416	7.64				53.5
1/30/2013	5.44	1.10	3.12	300	302	7.45				54.8
1/31/2013	5.65	1.53	3.33			7.40				55.7
2/1/2013	4.91	1.16	2.86			7.63				53.0
2/2/2013	5.39	1.10	2.99							
2/3/2013	5.10	1.05	3.04							
2/4/2013	5.58	0.99	3.03	308	335	8.00				50.4
2/5/2013	4.70	1.14	3.06	338	363	7.71				52.1
2/6/2013	4.78	1.04	2.81	360	421	7.45				53.1
2/7/2013	4.50	0.92	2.91			7.60				52.1
2/8/2013	5.30	0.76	2.60			7.68				51.5
2/9/2013	3.88	0.82	2.60							
2/10/2013	4.70	0.70	2.72							
2/11/2013	4.85	0.79	3.24	353	363	7.62				52.0
2/12/2013	4.57	1.09	2.96	368	324	7.85				53.3
2/13/2013	4.85	1.08	3.06	338	272	7.34				53.2
2/14/2013	4.69	1.08	2.72			7.54				52.9
2/15/2013	4.35	1.05	2.98			8.20				54.0
2/16/2013	5.30	1.09	3.02							
2/17/2013	5.16	0.90	3.02							
2/18/2013	5.40	1.01	3.15							
2/19/2013	4.90	1.10	3.20	330	324	7.59				52.2
2/20/2013	4.99	1.32	3.19	440	423	7.45				52.7
2/21/2013	4.72	1.29	3.10	338	305	7.68				51.9
2/22/2013	4.81	1.04	2.98			7.72				51.6
2/23/2013	4.76	1.13	3.02							
2/24/2013	5.55	1.07	3.41							
2/25/2013	5.35	0.83	3.08	278	299	7.71				52.8
2/26/2013	5.31	1.45	3.61	248	265	7.66				53.4
2/27/2013	7.58	1.83	5.26	270	260	7.62				52.5
2/28/2013	7.67	3.32	5.26			7.45				51.5
3/1/2013	7.09	3.17	4.97			7.52				52.8
3/2/2013	7.62	3.16	4.97							
3/3/2013	7.08	2.86	5.11							
3/4/2013	6.77	2.58	4.84	240	280	7.63				51.6
3/5/2013	6.48	2.58	4.30	255	293	7.48				52.3
3/6/2013	6.64	2.53	4.99	345	350	7.26				52.1
3/7/2013	8.11	2.37	3.82			7.96				52.1
3/8/2013	5.85	2.16	4.25			7.36				51.4
3/9/2013	6.42	2.18	4.06							
3/10/2013	6.72	2.23	4.51							
3/11/2013	6.77	2.52	5.17	263	284	7.62				52.1
3/12/2013	9.50	3.13	6.84	218	294	7.39				53.0
3/13/2013	9.49	4.95	6.17	195	198	7.35				51.0
3/14/2013	9.90	4.45	6.07			7.43				51.0
3/15/2013	7.91	3.99	5.86			7.47				51.4
3/16/2013	7.60	3.42	5.23							
3/17/2013	7.28	3.10	4.98							
3/18/2013	7.08	2.75	5.10	233	260	7.47				49.6
3/19/2013	7.41	2.81	5.00	270	335	7.26				51.2
3/20/2013	7.47	2.66	5.09	248	285	7.39				50.9
3/21/2013	9.69	2.60	4.42			7.24				51.4
3/22/2013	8.21	2.53	4.39			7.23				51.4
3/23/2013	11.97	2.41	4.43							
3/24/2013	6.65	2.24	4.60							
3/25/2013	7.06	2.28	4.20	233	291	7.37				52.5
3/26/2013	11.98	2.42	4.38	293	331	7.56				52.9
3/27/2013	11.98	2.24	4.17	390	441	7.48				52.5
3/28/2013	6.63	2.13	4.02			7.44				52.4
3/29/2013	6.39	1.88	4.09							
3/30/2013	6.74	1.80	3.82							
3/31/2013	6.70	1.79	3.90							
4/1/2013	10.39	1.80	4.12	370	538	7.79				53.4
4/2/2013	7.40	1.77	3.28	360	434	7.60				52.6
4/3/2013	6.45	1.78	3.83	315	335	7.52				53.1
4/4/2013	5.78	1.78	3.68			7.46				52.3
4/5/2013	5.50	1.59	3.34			7.40				54.3
4/6/2013	6.01	1.46	3.52							
4/7/2013	5.59	1.33	3.64							
4/8/2013	5.28	1.40	3.59	360	388	7.73				54.6
4/9/2013	6.81	1.41	3.42	340	334	7.56				55.7
4/10/2013	5.40	1.61	3.41	360	407	7.56				56.1

Date	Daily Flow			BOD (5-day)	Suspended Solids	pH	TKN	Total P	Temp.	Alkalinity
	Max.	Min.	Total	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Prim.
	mgd			mg/l			mg/l			Eff.
	Daily			Daily			Daily			Monthly
4/11/2013	5.34	1.41	3.34			7.48				54.6
4/12/2013	5.95	1.19	3.31			7.39				54.9
4/13/2013	5.56	1.50	3.43							
4/14/2013	5.34	1.32	3.31							
4/15/2013	5.91	1.26	2.40	380	420	7.85				54.7
4/16/2013	5.23	1.18	3.21	340	313	7.48				55.5
4/17/2013	5.11	1.16	2.51	323	298	7.61				56.2
4/18/2013	5.33	1.08	3.02			7.33				56.8
4/19/2013	5.76	1.19	2.94			7.44				56.8
4/20/2013	5.25	1.36	3.16							142
4/21/2013	5.27	1.10	3.25							
4/22/2013	5.05	1.16	3.21			7.53				56.0
4/23/2013	4.81	1.17	3.16	330	373	7.58				55.7
4/24/2013	5.43	1.20	3.02	360	359	7.60				56.2
4/25/2013	5.54	1.14	3.07	420	298	7.51				56.8
4/26/2013	5.39	1.01	2.84			7.35				57.7
4/27/2013	5.81	1.02	2.92							
4/28/2013	5.23	0.98	3.22							
4/29/2013	5.69	0.98	3.15	450	456	7.65				58.3
4/30/2013	5.24	1.39	3.05	450	462	7.71				58.3
5/1/2013	5.16	1.13	2.87	480	378	7.51	37.30	10		59.0
5/2/2013	4.92	1.07	2.99			7.91				58.4
5/3/2013	5.14	1.10	2.60			7.95				59.2
5/4/2013	5.07	0.90	2.69							
5/5/2013	5.30	0.85	3.04							
5/6/2013	4.93	0.88	3.04	465	538	7.72				58.9
5/7/2013	5.08	1.13	2.96	420	453	7.78	44.70	17.2		60.6
5/8/2013	5.99	1.03	3.33	400	463	7.85				62.9
5/9/2013	5.38	1.13	2.77			7.56				62.2
5/10/2013	5.20	0.92	2.72			7.87				61.7
5/11/2013	4.94	0.98	2.92							
5/12/2013	5.05	0.92	2.97							
5/13/2013	5.14	0.89	2.89	410	448	7.48				60.0
5/14/2013	4.82	0.92	2.97	430	527	7.46	46.90	10		59.9
5/15/2013	4.87	0.89	2.65	470	445	7.48				59.9
5/16/2013	4.73	0.88	2.68			7.58				60.7
5/17/2013	5.11	0.77	2.62			7.70				61.4
5/18/2013	4.88	0.79	2.71							172
5/19/2013	4.80	0.81	3.04							
5/20/2013	4.95	0.84	2.94	490	687	7.37				61.6
5/21/2013	5.14	0.98	2.92	480	517	7.76	45.00	15		64.5
5/22/2013	7.22	0.99	2.93	440	590	7.42				62.2
5/23/2013	4.81	0.84	3.33			7.42				63.1
5/24/2013	5.62	1.51	2.63			7.42				62.5
5/25/2013	5.32	1.24	3.46							
5/26/2013	5.46	1.37	3.16							
5/27/2013	5.39	1.29	3.55							
5/28/2013	5.89	1.29	4.53	370	480	7.79				61.3
5/29/2013	5.08	1.54	2.41	440	462	7.68	43.60	15.7		62.3
5/30/2013	5.52	1.66	3.44	285	280	7.64				63.5
5/31/2013	5.39	1.44	3.20			7.57				63.4
6/1/2013	5.30	1.33	3.22							
6/2/2013	5.30	1.30	3.26							
6/3/2013	5.43	1.21	3.51	340	358	7.60				63.2
6/4/2013	5.59	1.03	3.08	380	365	7.87	39.70	8.9		62.2
6/5/2013	4.79	1.03	2.93	430	505	7.80				63.7
6/6/2013	5.45	0.94	2.98			7.36				62.8
6/7/2013	6.54	1.06	4.70			7.78				62.2
6/8/2013	8.44	4.23	5.95							
6/9/2013	7.57	3.49	5.27							
6/10/2013	7.99	2.97	5.38	186	225	7.26				62.8
6/11/2013	7.82	3.51	5.89	156	219	7.18	21.00	7.3		62.1
6/12/2013	8.10	3.67	6.23	144	196	7.17				62.0
6/13/2013	8.23	3.28	6.23			7.22				61.7
6/14/2013	11.98	6.56	9.57			7.07				60.7
6/15/2013	11.20	6.93	8.11							
6/16/2013	9.49	5.30	7.91							
6/17/2013	8.84	4.50	5.71	165	248	7.10				63.9
6/18/2013	9.05	4.19	5.81	130	187	7.13	21.20	4.76		62.4
6/19/2013	11.29	2.19	5.62	218	291	7.17				62.3
6/20/2013	7.56	3.48	5.03			7.22				63.0
6/21/2013	8.91	2.93	4.91			7.28				63.3
6/22/2013	6.69	2.65	4.29							
6/23/2013	6.18	2.29	4.49							
6/24/2013	8.12	2.24	4.46	225	268	7.19				64.6
6/25/2013	6.58	2.24	4.16	353	388	7.24	30.30	12.8		65.0
6/26/2013	6.36	2.18	4.16	338	359	7.26				65.6
6/27/2013	6.06	0.84	3.85			7.31				65.0
6/28/2013	6.85	2.03	3.97			7.50				66.2
6/29/2013	5.62	1.98	3.72							
6/30/2013	5.90	1.79	3.68							
7/1/2013	5.60	1.64	3.71	330	328	7.31				65.7
7/2/2013	5.43	0.70	3.91	290	299	7.10	36.50	6.37		66.1
7/3/2013	5.85	1.31	2.88			7.13				65.7
7/4/2013	5.23	1.52	3.23	222	248					
7/5/2013	5.14	1.36	3.23			7.52				67.3
7/6/2013	5.24	1.34	3.12							
7/7/2013	5.13	1.25	3.29							
7/8/2013	5.97	1.23	3.43	330	437	7.38				67.9
7/9/2013	5.30	1.28	3.15	278	358	7.34	34.20	10.4		67.8
7/10/2013	6.93	1.27	2.42	270	361	7.24				67.0
7/11/2013	5.54	1.46	3.64			7.41				67.1
7/12/2013	5.57	1.40	2.89			7.59				67.2
7/13/2013	5.66	1.22	3.38							
7/14/2013	5.25	1.47	3.56							
7/15/2013	5.84	1.48	3.49	460	548	7.21				68.8
7/16/2013	5.84	1.36	3.34	263	310	7.38	30.80	9.1		68.2
7/17/2013	5.20	1.45	2.86	230	295	7.39				68.9
7/18/2013	4.54	0.97	2.65			7.20				71.5
7/19/2013	5.89	0.95	2.73			7.18				69.3

Date	Daily Flow			BOD (5-day)	Suspended Solids	pH	TKN	Total P	Temp.	Alkalinity
	Max.	Min.	Total	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Prim.
	mgd			mg/l			mg/l			Eff.
	Daily			Daily			Weekly			Monthly
						Work Day		Weekly	Work Day	
7/20/2013	4.93	0.87	2.69							
7/21/2013	5.44	0.85	2.83							
7/22/2013	7.49	0.86	2.73	410	613	7.38			69.7	
7/23/2013	5.42	0.96	2.92	460	632	7.43	45.90	16.3	70.0	184
7/24/2013	6.73	0.96	3.00	420	510	7.68			69.4	
7/25/2013	5.14	0.87	3.00			7.18			69.2	
7/26/2013	5.41	0.86	2.35			7.15			68.3	
7/27/2013	11.98	0.97	2.78							
7/28/2013	5.58	0.82	3.02							
7/29/2013	4.93	0.94	2.63	530	677	7.12			70.4	
7/30/2013	5.45	0.84	2.84	440	498	7.36	43.90	11.6	68.3	
7/31/2013	5.65	0.87	2.64	370	505	7.22			68.8	
8/1/2013	5.78	0.91	2.78			7.42			69.8	
8/2/2013	5.29	1.15	2.70			7.43			70.4	
8/3/2013	4.92	0.92	2.86							
8/4/2013	5.09	0.82	2.74							
8/5/2013	5.56	0.86	2.64	430	497	7.50			69.4	
8/6/2013	5.13	0.79	2.69	630	772	7.23	59.90	13.9	69.7	
8/7/2013	5.05	0.81	2.56	430	542	7.53			69.0	
8/8/2013	4.66	0.79	2.67			7.52			70.3	
8/9/2013	6.33	0.81	3.01			7.13			70.3	
8/10/2013	5.48	1.01	2.75							
8/11/2013	5.34	0.86	3.23							
8/12/2013	5.50	0.77	2.94	510	702	7.38			70.8	
8/13/2013	6.08	1.07	2.89	600	748	7.54	52.50	17.9	70.2	
8/14/2013	4.89	1.00	3.18	460	523	7.57			70.9	
8/15/2013	5.70	1.04	2.40			6.84			70.6	
8/16/2013	4.71	0.76	2.50			7.37			68.9	
8/17/2013	5.29	0.76	2.46							
8/18/2013	5.17	0.68	2.76							
8/19/2013	5.15	0.71	2.72	610	765	7.49			70.5	
8/20/2013	5.87	0.88	2.98	440	595	7.23	45.10	15.4	70.7	
8/21/2013	4.72	0.95	2.73	340	402	7.55			70.9	
8/22/2013	5.38	0.83	2.76			7.33			70.5	
8/23/2013	4.56	0.77	2.50			7.73			70.8	194
8/24/2013	5.69	0.68	2.50							
8/25/2013	5.03	0.64	2.68							
8/26/2013	5.21	0.48	2.97	340	410	7.58			71.4	
8/27/2013	5.53	1.56	2.89	330	430	7.21	44.00	15.8	70.9	
8/28/2013	4.71	0.93	2.92	340	420	7.22			71.2	
8/29/2013	4.49	0.92	2.56			7.63			71.4	
8/30/2013	6.40	0.76	2.56			7.49			70.7	
8/31/2013	4.86	0.62	2.58							
9/1/2013	4.68	0.91	2.62							
9/2/2013	5.18	0.75	2.91							
9/3/2013	5.86	0.73	2.77	400	466	7.75			72.0	
9/4/2013	6.26	0.59	2.71	310	321	7.34	41.61	17.5	70.9	
9/5/2013	4.75	0.81	2.76	420	547	7.53			69.6	
9/6/2013	4.91	0.69	2.38			7.92			69.8	
9/7/2013	5.48	0.67	2.57							
9/8/2013	5.02	0.62	2.72							
9/9/2013	5.39	0.59	2.62	350	420	7.68			69.0	
9/10/2013	4.84	0.62	2.63	353	397	7.52	46.20	12.1	70.0	
9/11/2013	5.28	0.78	2.63	320	348	7.88			70.5	
9/12/2013	6.48	0.63	2.54			7.24			71.3	
9/13/2013	5.84	0.68	2.63			7.27			71.2	
9/14/2013	5.50	0.71	2.71							
9/15/2013	7.72	0.65	2.71							
9/16/2013	5.63	0.71	2.70	490	608	7.70			69.3	
9/17/2013	8.67	0.94	2.74	460	567	7.74	49.85	15.8	70.0	
9/18/2013	5.91	0.84	3.08	310	403	7.82			70.3	
9/19/2013	5.22	0.82	2.20			7.65			69.4	
9/20/2013	6.38	0.61	2.48			7.47			68.7	198
9/21/2013	4.98	0.60	2.62							
9/22/2013	5.33	0.81	2.79							
9/23/2013	4.99	0.61	2.71	460	552	7.64			68.2	
9/24/2013	6.49	0.89	2.98	370	432	7.45	43.20	15.7	67.5	
9/25/2013	5.31	0.53	2.64	410	472	7.63			68.7	
9/26/2013	5.34	0.69	2.49			7.27			68.9	
9/27/2013	4.36	0.49	1.91			7.77			68.5	
9/28/2013	4.20	0.41	2.17							
9/29/2013	4.96	0.37	2.28							
9/30/2013	5.85	0.40	2.62	590	797	7.54			68.2	
10/1/2013	5.39	0.61	2.60	660	776	7.56	57.58	17.2	69.0	
10/2/2013	6.84	0.77	2.69	930	1475	7.51			68.2	
10/3/2013	5.03	0.69	2.77			7.63			68.9	
10/4/2013	5.83	0.48	1.99			8.18			67.6	
10/5/2013	4.74	0.56	2.47							
10/6/2013	5.33	0.61	3.23							
10/7/2013	5.37	0.65	2.32	400	535	7.84			69.1	
10/8/2013	6.32	0.67	2.90	410	528	7.75	48.11	14.7	67.7	
10/9/2013	4.94	0.79	2.69	390	460	7.67			67.9	
10/10/2013	6.33	0.80	2.70			7.46			66.8	
10/11/2013	5.32	0.64	2.40			7.94			67.8	
10/12/2013	5.19	0.66	2.59							
10/13/2013	5.84	0.70	2.72							
10/14/2013	5.20	0.67	2.61							
10/15/2013	5.77	0.57	2.58	530	563	7.67			68.1	
10/16/2013	4.95	0.52	2.74	650	540	7.25	47.61	10.9	67.0	
10/17/2013	4.83	0.63	2.22	550	563	7.42			67.7	
10/18/2013	4.89	0.62	2.51			7.40			67.4	190
10/19/2013	5.09	0.75	2.51							
10/20/2013	5.21	0.67	2.73							
10/21/2013	5.62	0.62	2.81	510	698	7.73			66.1	
10/22/2013	4.73	0.72	2.99	510	657	7.30	53.60	15	67.5	
10/23/2013	4.93	0.75	2.32	660	762	7.39			64.8	
10/24/2013	4.79	0.71	2.85			8.00			65.2	
10/25/2013	4.90	0.57	2.05			7.55			65.4	
10/26/2013	4.95	0.55	2.38							
10/27/2013	5.72	0.52	2.87							

Date	Daily Flow			BOD (5-day)	Suspended Solids	pH	TKN	Total P	Temp.	Alkalinity
	Max.	Min.	Total	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Prim.
	mgd			mg/l	mg/l	S. U.	mg/l	mg/l	° F	Eff.
	Daily			Daily	Daily	Work Day	Weekly	Weekly	Work Day	Monthly
10/28/2013	8.31	0.53	2.40	400	508	7.79				63.6
10/29/2013	5.05	0.73	2.47	495	602	7.72	53.99	16.8		65.4
10/30/2013	4.77	0.70	2.68	360	388	7.48				65.3
10/31/2013	5.75	0.61	2.46			7.66				64.9
11/1/2013	4.98	0.59	2.32			7.50				66.7
11/2/2013	4.70	0.45	2.44							
11/3/2013	5.32	0.50	2.71							
11/4/2013	5.19	0.46	2.60	560	775	7.54				64.1
11/5/2013	4.71	0.65	2.51	500	615	7.85	57.04	16.2		64.3
11/6/2013	4.71	0.68	2.36	510	650	7.95				64.8
11/7/2013	5.49	0.59	2.54			7.45				65.8
11/8/2013	4.51	0.54	2.16			8.17				65.0
11/9/2013	4.55	0.54	2.39							
11/10/2013	5.03	0.48	2.46							
11/11/2013	4.79	0.49	2.72							
11/12/2013	4.48	0.70	2.51	450	473	7.73				61.8
11/13/2013	5.05	0.61	2.44	410	460	7.76	49.56	18.2		62.0
11/14/2013	5.42	0.65	2.42	640	616	7.56				62.6
11/15/2013	4.87	0.55	2.42			7.50				63.0
11/16/2013	4.92	0.54	2.47							
11/17/2013	5.56	0.54	3.14							
11/18/2013	4.83	0.57	2.75	615	708	8.11				64.0
11/19/2013	4.88	0.80	2.14	520	607	7.64	51.76	19.4		63.4
11/20/2013	4.90	0.75	2.59	735	584	7.58				62.7
11/21/2013	7.50	0.76	2.48			8.09				61.3
11/22/2013	5.51	0.62	2.22			7.35				61.5
11/23/2013	5.86	0.61	2.57							
11/24/2013	4.90	0.65	3.01	390	353					
11/25/2013	5.45	0.62	2.27	750	838	7.62	55.65	11.5		60.9
11/26/2013	5.45	0.55	2.98	750	780	7.41				61.4
11/27/2013	5.70	0.83	2.22			7.34				58.8
11/28/2013	5.39	0.74	2.63							
11/29/2013	4.77	0.67	2.34							
11/30/2013	4.83	0.61	2.46							
12/1/2013	4.80	0.70	2.99							
12/2/2013	6.05	0.68	2.79	440	545	7.70	52.39	16.5		58.0
12/3/2013	6.06	0.87	2.35	480	578	7.77				60.1
12/4/2013	5.14	0.63	2.40	390	402	7.43				59.7
12/5/2013	4.58	0.50	2.83			7.45				59.8
12/6/2013	6.01	0.66	2.03			8.13				61.2
12/7/2013	5.09	0.66	2.54							
12/8/2013	5.32	0.65	3.12							
12/9/2013	6.51	0.69	2.84	370	406	7.54				53.6
12/10/2013	5.42	0.82	2.50	380	384	8.09	43.70	14.4		59.1
12/11/2013	4.50	0.82	2.87	370	308	7.62				57.7
12/12/2013	4.63	0.64	2.35			7.65				58.0
12/13/2013	7.36	0.54	2.37			7.53				56.4
12/14/2013	5.63	0.62	2.58							
12/15/2013	5.76	0.64	3.19							
12/16/2013	5.74	0.57	2.34	340	359	7.73	46.46	11.7		55.9
12/17/2013	6.08	0.82	2.71	380	349	7.57				54.5
12/18/2013	5.20	0.85	2.67	470	437	7.50				54.7
12/19/2013	6.21	0.81	2.66			8.08				56.9
12/20/2013	6.00	0.78	2.66			7.45				57.3
12/21/2013	5.97	0.75	2.81							
12/22/2013	5.93	0.80	2.93							
12/23/2013	7.23	0.87	3.40	323	306	7.61				58.0
12/24/2013	7.22	1.12	3.16			7.26				55.6
12/25/2013	5.64	1.19	2.99	285	254		42.86	7		
12/26/2013	6.51	1.03	3.29	360	360	7.83				54.7
12/27/2013	5.52	1.09	2.56			7.62				52.8
12/28/2013	6.29	0.94	2.84							
12/29/2013	5.81	0.67	3.85							
12/30/2013	6.92	1.25	3.51	390	361	7.78				55.7
12/31/2013	6.74	1.28	2.72			7.46				55.6
1/1/2014	5.19	1.16	3.48	323	254		43.88	7.7		
1/2/2014	6.10	1.11	2.84			7.92				52.7
1/3/2014	5.68	1.14	2.95			7.53				49.9
1/4/2014	6.17	1.13	3.01							
1/5/2014	6.35	0.97	3.38							
1/6/2014	8.02	1.16	3.56	260	272	7.40				55.4
1/7/2014	6.40	1.52	3.67	270	312	7.56				52.2
1/8/2014	6.76	1.50	3.60	330	435	7.66	38.71	11.6		52.9
1/9/2014	6.12	1.52	3.44			7.56				52.8
1/10/2014	6.25	1.33	2.85			7.37				55.0
1/11/2014	6.23	1.40	3.44							
1/12/2014	7.11	1.38	3.68							
1/13/2014	5.89	1.25	4.03	300	387	8.39				54.4
1/14/2014	6.81	1.42	3.15	440	468	7.42				55.6
1/15/2014	6.76	1.80	4.40	285	322	7.52	30.72	10.5		55.0
1/16/2014	6.65	1.72	3.35			7.38				55.1
1/17/2014	7.68	1.80	3.72			7.65				53.8
1/18/2014	6.26	1.70	3.60							150
1/19/2014	6.51	1.56	3.82							
1/20/2014	6.80	1.55	3.74							
1/21/2014	6.37	1.51	3.87	310	373	7.78				53.4
1/22/2014	6.39	1.53	3.31	350	361	7.61	37.80	10.5		49.7
1/23/2014	6.85	1.25	3.56	315	292	7.55				50.3
1/24/2014	6.24	1.36	2.86			7.51				51.5
1/25/2014	6.04	1.21	3.27							
1/26/2014	6.01	1.10	3.61							
1/27/2014	7.28	1.17	3.33	360	451	7.78				53.6
1/28/2014	5.56	1.28	3.20	600	383	7.53	37.13	11.6		51.3
1/29/2014	6.23	1.37	3.15	470	568	7.47				53.4
1/30/2014	6.20	1.23	3.08			7.91				52.1
1/31/2014	7.56	1.11	3.04			8.06				53.8
2/1/2014	5.68	1.00	2.97							
2/2/2014	6.01	1.08	3.58							
2/3/2014	5.96	0.98	2.51	360	391	8.40				54.4
2/4/2014	5.37	0.99	3.25	370	477	8.07	44.10	11.5		52.9

Date	Daily Flow			BOD (5-day)	Suspended Solids	pH	TKN	Total P	Temp.	Alkalinity
	Max.	Min.	Total	Inf. mg/l Daily	Inf. mg/l Daily	Inf. S. U. Work Day	Inf. mg/l Weekly	Inf. mg/l Weekly	Inf. ° F Work Day	Prim. Eff. mg/l Monthly
		mgd								
		Daily								
2/5/2014	5.55	1.22	2.89	340	358	7.47			52.4	
2/6/2014	6.11	1.10	2.83			7.61			50.3	
2/7/2014	6.04	0.90	2.87			7.88			52.3	
2/8/2014	6.34	0.85	2.90							
2/9/2014	6.39	0.86	3.17							
2/10/2014	5.81	0.82	2.90	380	410	7.45			52.2	
2/11/2014	6.54	1.03	2.92	370	398	8.00	43.31	14.7	53.4	
2/12/2014	5.05	1.11	2.79	430	467	7.73			50.4	
2/13/2014	5.43	0.89	3.14			7.63			50.7	
2/14/2014	6.00	0.99	2.51			7.75			51.1	
2/15/2014	6.24	0.84	2.79							
2/16/2014	5.98	0.88	2.90							
2/17/2014	6.48	0.85	2.94							
2/18/2014	5.17	0.77	3.05	420	460	7.64			49.5	
2/19/2014	5.38	1.10	2.91	380	398	7.33	45.06	11.8	50.2	
2/20/2014	5.96	1.02	3.14	370	370	7.68			52.8	
2/21/2014	5.58	1.05	2.93			7.88			53.5	
2/22/2014	6.18	1.02	3.17							
2/23/2014	6.59	1.20	3.54							
2/24/2014	8.69	1.16	3.38	390	404	7.90			52.2	142
2/25/2014	6.61	1.47	3.52	290	324	7.73	46.27	12.8	53.3	
2/26/2014	6.00	1.42	3.30	310	337	7.52			53.3	
2/27/2014	6.43	1.07	3.14			7.59			51.3	
2/28/2014	6.32	1.28	3.24			7.62			49.4	
3/1/2014	6.69	1.25	3.50							
3/2/2014	6.07	1.19	3.50							
3/3/2014	5.63	1.11	2.89			7.79			51.5	
3/4/2014	5.64	1.23	3.23	300	378	7.78			49.9	
3/5/2014	6.18	1.38	3.25	350	345	7.47			52.7	
3/6/2014	6.29	1.32	3.93	400	437	8.14	42.62	12.4	50.1	
3/7/2014	6.16	1.13	2.11			7.50			50.5	
3/8/2014	7.25	1.04	2.90							
3/9/2014	5.49	0.93	3.18							
3/10/2014	6.71	0.96	3.14	320	353	7.93			52.4	
3/11/2014	6.78	1.18	3.29	290	318	7.68			53.6	
3/12/2014	6.79	1.30	4.10	280	314	7.49	31.94	12.4	52.7	
3/13/2014	5.66	1.81	3.22			7.72			50.1	
3/14/2014	6.41	1.47	3.46			7.78			50.9	
3/15/2014	6.39	1.54	3.48							
3/16/2014	6.56	1.55	4.30							
3/17/2014	6.63	1.65	3.30	260	273	7.75			50.6	
3/18/2014	6.42	1.66	3.71	320	300	7.49	32.39	9.3	51.1	
3/19/2014	6.19	1.55	3.87	280	268	7.39			52.6	
3/20/2014	6.89	2.10	3.90			7.41			52.0	
3/21/2014	6.93	1.89	3.82			7.20			53.0	130
3/22/2014	6.56	1.85	3.85							
3/23/2014	6.80	1.80	4.04							
3/24/2014	6.45	1.61	3.87	310	379	7.70			51.3	
3/25/2014	6.83	1.73	4.25	270	307	7.59			51.6	
3/26/2014	6.84	1.61	3.36	320	314	7.68	30.17	9.55	53.2	
3/27/2014	7.39	1.65	3.54			7.61			52.5	
3/28/2014	5.82	1.51	3.25			7.35			53.0	
3/29/2014	6.10	1.33	4.36							
3/30/2014	10.35	3.50	6.85							
3/31/2014	10.90	4.70	7.64			7.19			50.7	
4/1/2014	10.49	5.01	6.82	180	294	7.30			50.9	
4/2/2014	10.70	4.47	6.26	138	152	7.19	18.82	5.7	50.8	
4/3/2014	8.70	4.01	5.88	158	131	7.31			51.0	
4/4/2014	9.99	2.24	5.39			7.27			52.5	
4/5/2014	8.57	3.33	5.14							
4/6/2014	9.00	2.98	5.88							
4/7/2014	7.88	2.86	4.79	210	249	7.30			53.9	
4/8/2014	7.41	3.07	4.67	210	245	7.21	24.16	6.65	54.4	
4/9/2014	7.86	2.26	4.64	255	216	7.39			52.7	
4/10/2014	8.38	2.60	4.30			7.35			52.2	
4/11/2014	6.72	2.48	4.23			7.70			53.4	
4/12/2014	7.58	2.34	4.26							
4/13/2014	6.87	2.26	5.15							
4/14/2014	7.43	2.09	3.70			7.79			55.5	
4/15/2014	8.04	2.33	5.70	330	411	7.36	36.40	10.35	55.2	
4/16/2014	8.25	3.30	4.77	204	194	7.41			53.7	
4/17/2014	7.97	3.16	5.00			7.48			52.5	
4/18/2014	7.87	2.95	5.05							
4/19/2014	7.50	2.73	4.58							
4/20/2014	8.69	2.50	5.02							
4/21/2014	7.54	2.47	4.53	278	290	7.68			55.9	
4/22/2014	7.62	2.33	4.44	240	288	7.43	30.75	9.7	55.3	
4/23/2014	6.60	2.49	4.37	285	294	7.42			55.5	
4/24/2014	6.94	2.30	4.13			7.66			54.5	132
4/25/2014	6.82	1.99	3.97			7.70			55.7	
4/26/2014	6.54	2.02	4.03							
4/27/2014	7.40	2.17	4.48							
4/28/2014	6.87	2.04	3.84	293	335	7.84			55.3	
4/29/2014	6.69	2.07	4.19	360	415	7.65	29.59	7	56.5	
4/30/2014	6.76	1.99	5.00	255	320	7.56			54.8	
5/1/2014	9.50	3.72	5.77			7.22			54.8	
5/2/2014	11.44	3.48	5.75			7.24			55.1	
5/3/2014	8.36	3.32	5.16							
5/4/2014	7.87	3.10	5.29							
5/5/2014	7.73	2.82	4.91	233	290	7.41			55.4	
5/6/2014	8.59	2.91	4.84	338	473	7.37	31.51	12.2	56.2	
5/7/2014	8.21	2.58	4.69	280	329	7.38			56.3	
5/8/2014	7.21	2.46	4.39			7.51			56.7	
5/9/2014	7.87	2.24	4.28			7.26			56.4	
5/10/2014	7.53	2.26	4.55							
5/11/2014	7.29	2.34	4.66							
5/12/2014	6.76	2.07	4.19	240	308	7.57			58.7	
5/13/2014	7.32	2.20	4.02	263	350	7.60	29.99	10	59.5	
5/14/2014	7.05	2.12	4.39	270	359	7.48			57.9	
5/15/2014	6.42	1.83	3.47			7.45			59.2	148

Date	Daily Flow			BOD (5-day)	Suspended Solids	pH	TKN	Total P	Temp.	Alkalinity
	Max.	Min.	Total	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Prim.
	mgd			mg/l	mg/l	S. U.	mg/l	mg/l	° F	Eff.
	Daily			Daily	Daily	Work Day	Weekly	Weekly	Work Day	Monthly
5/16/2014	6.28	1.87	4.24			7.28			58.2	
5/17/2014	7.31	2.20	4.50							
5/18/2014	8.14	2.24	4.77							
5/19/2014	8.39	2.24	4.26	350	466	7.41			58.7	
5/20/2014	7.24	2.23	4.60	370	457	7.50	33.22	12.4	58.8	
5/21/2014	6.82	2.06	3.95	248	271	7.31			59.0	
5/22/2014	6.82	2.02	4.07			7.28			59.0	
5/23/2014	8.28	1.98	4.42			7.34			59.7	
5/24/2014	8.53	2.84	4.91							
5/25/2014	7.76	2.94	5.07							
5/26/2014	8.34	2.66	5.53							
5/27/2014	7.66	2.60	4.72	250	343	7.47	24.80	9.6	61.2	
5/28/2014	7.73	2.53	4.09	255	340	7.48			59.3	
5/29/2014	7.12	2.55	4.25	400	540	7.47			59.7	
5/30/2014	6.63	2.17	4.09			7.47			60.0	
5/31/2014	6.60	2.01	3.88							
6/1/2014	7.32	1.73	4.34							
6/2/2014	7.05	1.81	4.10	308	405	7.45			61.6	
6/3/2014	7.23	1.78	3.92	340	423	7.36	34.41	12.1	63.1	
6/4/2014	6.70	1.83	4.09	260	308	7.37			62.3	
6/5/2014	6.57	1.72	3.30			7.61			62.2	132
6/6/2014	5.72	1.55	3.52			7.70				
6/7/2014	6.37	1.46	3.26							
6/8/2014	6.24	1.36	3.59						63.0	
6/9/2014	6.10	1.27	3.59	340	413	7.64			63.5	
6/10/2014	5.97	1.51	3.63	360	458	7.60	36.33	15.4	62.5	
6/11/2014	6.20	1.62	3.53	330	400	7.78			61.6	
6/12/2014	7.41	1.37	3.40			7.44			63.9	
6/13/2014	5.33	1.31	3.14			7.80				
6/14/2014	5.76	1.24	3.27							
6/15/2014	5.76	1.24	3.35						64.0	
6/16/2014	6.34	1.21	3.32	320	445	7.47			63.7	
6/17/2014	6.17	1.21	3.34	320	464	7.42	36.12	19	63.9	
6/18/2014	5.88	1.32	2.75	430	583	7.37			65.6	
6/19/2014	5.50	1.09	3.63			7.58			63.2	
6/20/2014	7.16	1.05	2.70			7.25				
6/21/2014	5.65	0.98	2.87							
6/22/2014	5.63	0.95	3.54						64.6	
6/23/2014	6.54	0.87	2.57	370	475	7.42			64.8	
6/24/2014	5.14	0.93	2.81	400	501	7.33	41.75	10.8	65.8	
6/25/2014	5.55	0.88	2.82	400	493	7.35			65.0	
6/26/2014	5.04	1.11	2.82			7.66			65.0	
6/27/2014	5.68	0.86	2.80			7.64				
6/28/2014	5.02	0.85	2.66							
6/29/2014	5.49	0.80	2.82						67.1	
6/30/2014	4.79	0.80	2.40	360	468	7.35			66.2	
7/1/2014	5.31	1.01	2.69	410	590	7.58	37.29	14.1	68.1	
7/2/2014	6.29	0.96	2.92	460	598	7.82			66.7	
7/3/2014	6.25	0.81	2.82			7.24				
7/4/2014	5.11	0.93	2.78							
7/5/2014	5.51	0.92	2.71							
7/6/2014	5.48	0.93	3.09							
7/7/2014	5.35	0.85	2.74	500	640	7.73			67.3	
7/8/2014	5.87	1.04	2.92	495	750	7.45	47.08	17.8	67.6	
7/9/2014	4.95	0.99	2.80	490	698	7.55			66.7	
7/10/2014	4.74	0.86	2.58			7.76			67.9	186
7/11/2014	4.52	0.83	2.42			7.86				
7/12/2014	5.49	0.98	2.50							
7/13/2014	4.92	0.69	2.96						68.3	
7/14/2014	5.02	0.79	2.56	410	581	7.62			69.0	
7/15/2014	4.95	0.98	2.85	300	416	7.51	35.15	16.1	68.1	
7/16/2014	6.87	1.06	3.21	310	338	7.41			69.6	
7/17/2014	6.06	0.97	2.76			8.07			68.2	
7/18/2014	5.87	0.89	2.58			7.74				
7/19/2014	4.96	0.75	2.39							
7/20/2014	4.78	0.74	2.57						69.5	
7/21/2014	7.38	0.64	2.80	400	518	7.88			69.5	
7/22/2014	4.52	0.88	2.64	350	458	7.40	43.57	17.1	69.9	
7/23/2014	5.31	1.89	2.72	320	370	7.36			69.1	
7/24/2014	5.00	0.89	2.53			7.76			68.1	
7/25/2014	5.20	0.62	2.44			7.46				
7/26/2014	4.85	0.59	2.25							
7/27/2014	5.38	0.65	2.59						69.0	
7/28/2014	6.06	0.66	2.55	1005	1236	7.67			68.7	
7/29/2014	4.56	1.74	2.39	400	432	7.51	47.18	11.7	68.9	
7/30/2014	4.38	0.61	2.34	320	338	7.88			69.5	
7/31/2014	4.83	0.63	2.31			7.57			70.3	
8/1/2014	4.73	0.58	2.25			7.77				
8/2/2014	4.48	0.64	2.27							
8/3/2014	4.74	0.55	2.42							
8/4/2014	4.98	0.64	2.46	310	297	7.74			68.6	
8/5/2014	3.95	0.58	2.33	430	382	7.43			70.5	
8/6/2014	4.51	0.61	2.22	500	386	7.02	56.66	15.8	69.7	178
8/7/2014	4.88	0.56	2.41			7.61			68.1	
8/8/2014	4.58	0.57	2.26			7.00				
8/9/2014	4.15	0.55	2.20							
8/10/2014	3.93	0.52	2.28						69.3	
8/11/2014	4.35	1.74	2.64	490	598	7.66			69.8	
8/12/2014	4.12	0.50	2.31	340	309	7.90	46.42	23.9	69.4	
8/13/2014	5.40	0.71	2.68	360	357	7.39			69.9	
8/14/2014	5.14	0.85	2.70			7.41			68.9	
8/15/2014	4.67	0.67	2.32			7.81				
8/16/2014	4.60	0.53	2.28							
8/17/2014	4.46	0.58	2.33						69.0	
8/18/2014	4.95	0.56	2.54	380	332	7.79			70.0	
8/19/2014	4.31	0.80	2.52	610	613	7.97	47.95	16.6	70.1	
8/20/2014	4.13	0.72	2.37	330	305	7.28			70.2	
8/21/2014	4.33	0.77	2.37			7.58			69.5	
8/22/2014	4.63	0.56	2.21			7.37				
8/23/2014	4.35	0.46	2.11							

Date	Daily Flow			BOD (5-day)	Suspended Solids	pH	TKN	Total P	Temp.	Alkalinity
	Max.	Min.	Total	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Prim.
	mgd			mg/l	mg/l	S. U.	mg/l	mg/l	° F	Eff.
	Daily			Daily	Daily	Work Day	Weekly	Weekly	Work Day	Monthly
8/24/2014	4.49	0.47	2.41							69.9
8/25/2014	4.92	0.49	2.50	270	369	7.85				71.2
8/26/2014	5.01	0.65	2.48	330	350	7.55	47.15	16		71.4
8/27/2014	5.24	0.62	2.54	310	308	7.42				70.4
8/28/2014	4.90	0.66	2.29			7.60				71.2
8/29/2014	5.37	0.56	2.23			8.02				
8/30/2014	4.50	0.45	2.25							
8/31/2014	4.27	0.44	2.27							
9/1/2014	5.82	0.48	2.88							72.5
9/2/2014	4.89	0.51	2.12	260	263	7.97				71.6
9/3/2014	4.99	0.65	2.51	360	325	7.30	45.16	14.1		72.9
9/4/2014	5.23	0.65	2.34	370	330	7.17				71.2
9/5/2014	5.83	0.46	2.19			7.37				
9/6/2014	4.99	0.51	2.18							
9/7/2014	5.48	0.45	2.46							71.2
9/8/2014	5.31	0.47	2.45	300	372	7.62				71.2
9/9/2014	5.07	0.57	2.23	400	393	7.85	51.40	14.6		70.6
9/10/2014	4.68	0.49	2.27	320	365	7.27				70.8
9/11/2014	4.36	0.58	2.13			7.34				70.2
9/12/2014	4.98	0.41	2.12			7.35				
9/13/2014	4.56	0.48	2.23							
9/14/2014	4.86	0.45	2.49							68.9
9/15/2014	4.64	0.36	2.73	330	432	7.52	49.50	15.6		68.4
9/16/2014	5.03	0.65	2.29	370	410	7.60				67.4
9/17/2014	6.69	0.62	2.17	380	400	7.38				69.7
9/18/2014	4.54	0.65	2.93			7.17				68.2
9/19/2014	5.17	0.49	1.55			7.80				
9/20/2014	4.91	0.44	2.20							
9/21/2014	5.31	0.69	2.56							69.8
9/22/2014	5.11	0.47	2.29	370	523	7.86				68.4
9/23/2014	4.87	0.46	2.34	330	387	7.72				67.5
9/24/2014	5.34	0.47	2.34	380	346	7.87	46.26	9.3		68.8
9/25/2014	5.19	0.39	2.17			7.51				68.4
9/26/2014	4.22	0.41	2.10			7.26				
9/27/2014	4.68	0.46	2.18							
9/28/2014	4.40	0.41	2.28							68.9
9/29/2014	5.43	0.44	2.45	450	510	7.77				69.4
9/30/2014	4.99	0.41	2.16	460	434	7.86				69.4
10/1/2014	4.86	0.46	2.25	330	354	7.99	44.61	8.4		69.2
10/2/2014	4.77	0.47	2.17			7.71				67.8
10/3/2014	4.93	0.40	2.18			7.85				
10/4/2014	4.48	0.45	2.25							
10/5/2014	5.30	0.43	2.53							67.7
10/6/2014	5.59	0.45	2.40	440	571	8.08				68.7
10/7/2014	4.36	0.65	2.30	450	478	7.79	51.26	16.6		69.8
10/8/2014	4.44	0.66	2.44	420	360	7.63				66.8
10/9/2014	4.35	0.59	2.14			7.28				67.6
10/10/2014	4.99	0.48	2.14			8.32				
10/11/2014	5.08	0.49	2.25							
10/12/2014	4.49	0.43	2.25							
10/13/2014	4.60	0.40	2.44							68.6
10/14/2014	4.70	1.19	2.41	390	390	7.84				69.2
10/15/2014	4.10	0.43	2.19	490	413	7.76	47.85	4.97		66.9
10/16/2014	4.16	0.38	2.36	370	328	7.05				67.4
10/17/2014	4.34	0.44	2.05			7.81				
10/18/2014	5.01	0.53	2.22							
10/19/2014	4.47	0.46	2.47							63.4
10/20/2014	4.70	0.33	2.50	410	526	7.80				65.4
10/21/2014	4.51	0.57	2.30	420	556	7.78				65.8
10/22/2014	4.62	0.59	2.39	440	480	7.52	57.09	13.5		65.7
10/23/2014	5.21	0.46	2.50			7.53				65.5
10/24/2014	4.84	0.48	2.20			7.83				
10/25/2014	4.70	0.48	2.26							
10/26/2014	5.11	0.50	2.38							65.6
10/27/2014	4.76	0.46	2.33	450	552	7.31				65.3
10/28/2014	5.12	0.63	2.42	460	550	7.22				67.2
10/29/2014	4.73	0.49	2.70	410	486	7.56	55.64	13.2		65.5
10/30/2014	4.85	0.35	1.76			7.85				64.5
10/31/2014	4.36	0.46	2.16			7.79				
11/1/2014	4.32	0.38	2.04							
11/2/2014	4.85	0.39	2.47							64.7
11/3/2014	6.48	0.45	2.39	405	648	7.81				64.6
11/4/2014	4.91	0.63	2.32	435	533	8.31	52.88	15.1		65.3
11/5/2014	4.50	0.44	2.16	450	498	8.00				64.1
11/6/2014	5.09	0.47	2.32			7.76				63.9
11/7/2014	4.13	0.51	1.95			7.53				
11/8/2014	6.55	0.40	2.22							
11/9/2014	5.03	0.44	2.44							64.5
11/10/2014	5.00	0.41	2.22			7.83				
11/11/2014	5.05	0.39	2.18	430	483					64.1
11/12/2014	4.68	0.42	2.21	460	552	7.79				63.2
11/13/2014	4.83	0.41	2.13	420	494	8.11	63.39	11.4		62.3
11/14/2014	4.52	0.39	2.07			8.09				
11/15/2014	5.03	0.38	2.23							
11/16/2014	4.81	0.42	2.40							59.8
11/17/2014	5.07	0.48	2.67	350	460	8.24				62.0
11/18/2014	4.42	0.66	2.46	460	492	7.54	46.95	14.3		61.4
11/19/2014	4.96	0.64	2.37	440	438	7.78				59.4
11/20/2014	5.64	0.50	2.25			7.82				60.8
11/21/2014	5.57	0.48	2.25			8.00				
11/22/2014	5.34	0.41	2.31							
11/23/2014	4.92	0.42	2.45	323	313					62.1
11/24/2014	5.14	0.42	2.58	900	1138	7.32	75.22	18.4		61.6
11/25/2014	4.30	0.65	2.35	570	766	7.81				60.0
11/26/2014	4.69	0.49	2.60			7.51				
11/27/2014	5.37	0.66	2.21							
11/28/2014	4.95	0.56	2.57							
11/29/2014	5.03	0.55	2.20							
11/30/2014	4.90	0.55	2.76							60.7
12/1/2014	5.99	0.61	2.62	520	720	7.91				60.0

Date	Daily Flow			BOD (5-day)	Suspended Solids	pH	TKN	Total P	Temp.	Alkalinity
	Max.	Min.	Total	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Prim.
	mgd			mg/l	mg/l	S. U.	mg/l	mg/l	° F	Eff.
	Daily			Daily	Daily	Work Day	Weekly	Weekly	Work Day	Monthly
12/2/2014	5.07	0.84	2.62	550	602	7.46	52.52	16.3	59.7	
12/3/2014	5.91	0.90	2.63	540	578	7.88			59.8	
12/4/2014	5.03	0.67	2.49			8.07			59.1	134
12/5/2014	4.42	0.58	2.32			8.39				
12/6/2014	4.97	0.75	2.83							
12/7/2014	4.78	0.83	2.91						58.7	
12/8/2014	5.69	1.66	2.61	450	542	7.39			57.2	
12/9/2014	7.04	0.66	4.19	330	412	8.09			56.5	
12/10/2014	6.38	2.94	3.97	270	309	7.53	32.20	5.8	60.6	
12/11/2014	6.14	1.83	3.52			7.39			58.0	
12/12/2014	6.21	1.61	3.43			7.84				
12/13/2014	6.14	1.66	3.24							
12/14/2014	5.78	1.31	3.70						58.2	
12/15/2014	6.34	1.23	3.15	330	422	7.73			57.9	
12/16/2014	5.28	1.28	3.38	320	455	7.60	37.40		57.9	
12/17/2014	5.29	1.63	3.28	340	352	7.81			57.5	
12/18/2014	5.46	1.39	3.20			7.62			57.0	
12/19/2014	6.28	2.12	3.01			7.54				
12/20/2014	5.76	1.12	2.99							
12/21/2014	5.86	1.06	3.53	230	234				56.3	
12/22/2014	5.48	0.98	2.74	280	348	7.57	40.30	8.4	56.9	
12/23/2014	4.85	1.09	2.89	330	296	8.01			55.7	
12/24/2014	5.35	1.05	3.08			7.60				
12/25/2014	5.05	1.16	2.95						55.8	
12/26/2014	5.42	1.14	3.04			7.50				
12/27/2014	5.42	1.10	3.08							
12/28/2014	6.05	1.15	3.16	246	227				55.2	
12/29/2014	5.47	1.14	3.18	340	306	7.41			55.8	
12/30/2014	5.39	1.08	3.03	350	250	7.30	37.30	6.1	54.8	
12/31/2014	5.40	1.07	3.01			8.01				
1/1/2015	5.45	1.06	2.92						55.2	
1/2/2015	4.81	1.08	2.65			7.78				
1/3/2015	5.67	0.97	2.91							
1/4/2015	5.88	1.14	3.73						56.2	
1/5/2015	5.11	1.05	2.69	390	460	8.36			55.1	
1/6/2015	6.82	1.11	3.54	320	333	7.35	37.70	12.5	54.7	
1/7/2015	5.20	1.19	3.12	380	369	7.67			53.6	
1/8/2015	4.92	1.03	2.81			7.66			54.3	
1/9/2015	4.64	0.94	2.66			8.03				
1/10/2015	5.29	0.97	2.83							
1/11/2015	6.04	0.80	3.02						55.0	
1/12/2015	5.85	0.87	3.06	280	339	7.42			52.8	
1/13/2015	5.27	1.05	3.06	300	399	7.84	39.87	11.8	54.0	
1/14/2015	4.88	1.03	2.81	320	330	7.53			53.7	
1/15/2015	5.02	0.86	2.72			7.72			55.3	
1/16/2015	5.33	0.81	2.63			7.82				
1/17/2015	5.51	0.70	2.65							
1/18/2015	7.99	0.73	3.68							
1/19/2015	5.55	1.15	3.36						54.1	
1/20/2015	5.19	1.08	2.81	320	319	7.61			53.8	
1/21/2015	5.73	0.89	3.02	310	306	7.64	35.92	9.9	55.3	
1/22/2015	5.17	1.18	2.84	310	293	7.77			54.5	
1/23/2015	5.61	1.02	2.90			7.50				
1/24/2015	5.96	0.92	2.72							
1/25/2015	5.81	0.84	3.10						49.7	
1/26/2015	5.21	0.83	2.70			7.50			49.5	
1/27/2015	5.01	0.86	2.68	233	248	7.50			46.8	
1/28/2015	5.20	0.81	2.86	240	283	7.88	38.05	10	51.6	
1/29/2015	5.03	0.93	2.75	330	396	7.95			53.6	
1/30/2015	4.99	0.98	2.57			7.79				
1/31/2015	5.73	0.75	2.72							
2/1/2015	6.16	0.69	2.73						49.7	
2/2/2015	5.28	0.76	2.93	290	328	7.79			49.4	
2/3/2015	5.10	0.84	2.93	310	355	7.88	37.65	10.7	51.9	
2/4/2015	5.50	0.86	2.52	340	357	7.63			53.3	
2/5/2015	4.88	0.89	2.69			7.30			51.5	
2/6/2015	4.57	0.75	2.47			7.73				
2/7/2015	5.57	0.62	2.47							
2/8/2015	5.16	0.62	2.67						49.6	184
2/9/2015	4.65	0.66	2.69	330	370	7.76			51.8	
2/10/2015	5.68	0.77	2.62	400	404	8.11	43.18	11.2	49.8	
2/11/2015	5.15	0.82	2.64	330	365	7.63			54.1	
2/12/2015	5.14	0.87	2.93			7.65			51.6	
2/13/2015	4.56	0.56	2.03			8.07				
2/14/2015	5.33	0.62	2.51							
2/15/2015	5.36	0.67	2.63							
2/16/2015	5.34	0.64	2.60						50.1	
2/17/2015	5.18	0.77	2.70	390	426	7.69			50.2	
2/18/2015	5.38	0.74	2.74	370	364	7.40	38.16	12	52.6	
2/19/2015	5.25	0.85	2.59	380	343	7.86			51.6	
2/20/2015	4.81	0.59	2.44			7.83				
2/21/2015	5.39	0.58	2.29							
2/22/2015	5.63	0.47	2.61						50.5	
2/23/2015	5.21	0.57	2.60	360	392	8.10			51.1	
2/24/2015	5.12	0.75	2.59	350	440	7.91	42.80	13.6	51.1	
2/25/2015	4.76	0.72	2.67	390	407	7.67			52.9	
2/26/2015	4.92	0.67	2.46			7.42			49.9	
2/27/2015	5.14	0.47	2.30			7.71				
2/28/2015	5.56	0.56	2.41							
3/1/2015	5.37	0.47	2.62						53.9	
3/2/2015	4.92	0.56	2.73	360	333	8.32			52.9	
3/3/2015	4.89	0.53	2.33	320	275	8.27	40.00	7	52.0	
3/4/2015	6.31	0.89	2.83	340	303	7.73			52.8	
3/5/2015	4.62	0.62	2.54			7.89			50.9	
3/6/2015	5.16	0.64	2.42			7.59				
3/7/2015	5.36	0.61	2.50							
3/8/2015	5.45	0.63	2.88						52.2	
3/9/2015	5.48	0.56	2.79	320	320	7.69			51.8	
3/10/2015	5.57	0.78	3.09	320	343	7.67	35.20	11.1	52.3	
3/11/2015	6.19	1.14	3.16	280	241	7.50			51.0	

Date	Daily Flow			BOD (5-day)	Suspended Solids	pH	TKN	Total P	Temp.	Alkalinity
	Max.	Min.	Total	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Prim.
	mgd			mg/l		S. U.	mg/l	mg/l	° F	Eff.
	Daily			Daily	Daily	Work Day	Weekly	Weekly	Work Day	Monthly
3/12/2015	5.98	1.23	3.16			7.68			51.2	
3/13/2015	6.23	1.23	3.24			7.61				
3/14/2015	5.56	1.29	3.90							
3/15/2015	*	*	4.33							
3/16/2015	6.87	3.42	4.18	240	209	7.37				50.4
3/17/2015	6.14	2.14	4.54	248	224	7.50	25.70	6.9		51.3
3/18/2015	7.22	2.55	4.30	240	239	7.34				49.8
3/19/2015	6.81	2.34	4.22			7.34				49.7
3/20/2015	6.96	1.92	3.66			7.64				52.1
3/21/2015	7.17	1.88	4.02							
3/22/2015	6.91	1.92	4.14							
3/23/2015	6.98	1.79	3.93	440	321	7.69				51.7
3/24/2015	5.95	2.01	3.72	300	335	7.49	30.50	7.1		51.7
3/25/2015	6.50	1.87	4.23	310	244	7.42				50.0
3/26/2015	6.56	1.94	4.55			7.64				51.9
3/27/2015	8.61	2.94	5.32			7.30				50.5
3/28/2015	8.69	3.26	5.30							
3/29/2015	8.49	3.00	5.46							
3/30/2015	8.66	2.90	5.16	260	261	7.42				49.6
3/31/2015	8.27	3.08	6.17	290	281	7.32				49.8
4/1/2015	7.84	3.12	4.27	280	239	7.34	23.76	7.8		51.0
4/2/2015	7.81	3.02	5.20			7.28				50.8
4/3/2015	11.98	3.31	5.33							
4/4/2015	9.38	3.67	6.10							
4/5/2015	8.58	3.68	5.99							
4/6/2015	9.37	3.48	5.71	210	304	7.33				49.7
4/7/2015	7.87	3.51	5.40	173	219	7.36	41.27	5.9		51.0
4/8/2015	8.32	3.27	6.26	218	234	6.94				51.2
4/9/2015	7.81	3.59	4.63			7.40				52.5
4/10/2015	8.61	3.58	5.95			7.35				51.1
4/11/2015	8.32	3.63	5.36							
4/12/2015	7.96	3.30	5.84							
4/13/2015	9.42	3.13	5.82	190	276	7.40				52.0
4/14/2015	7.47	2.87	4.34	290	306	7.23	26.50	6.15		51.2
4/15/2015	7.37	2.65	4.34	218	274	7.42				52.2
4/16/2015	7.27	2.36	4.14			7.57				52.9
4/17/2015	7.16	2.50	4.14			7.24				52.2
4/18/2015	7.89	2.24	4.46							80
4/19/2015	7.31	2.20	4.62							
4/20/2015	8.20	2.07	4.89	230	344	7.52				54.3
4/21/2015	8.76	2.93	5.40	230	294	7.46	33.98	8		54.0
4/22/2015	7.76	0.48	4.83	200	238	7.47				53.8
4/23/2015	6.85	2.58	4.90			7.53				53.4
4/24/2015	7.63	2.55	4.04			7.28				52.9
4/25/2015	6.93	2.39	4.45							
4/26/2015	7.68	2.24	4.36							
4/27/2015	6.79	2.11	4.39	370	543	7.45				53.6
4/28/2015	7.18	2.28	4.59	370	503	7.70	31.91	9.2		55.1
4/29/2015	6.55	1.73	4.25	320	387	7.35				55.2
4/30/2015	9.38	1.72	3.34			7.28				55.0
5/1/2015	7.23	1.50	3.42			7.52				55.8
5/2/2015	6.44	1.46	3.62							
5/3/2015	6.16	1.49	3.77							
5/4/2015	6.53	1.43	4.15	360	563	7.54				57.1
5/5/2015	8.06	1.90	3.48	360	498	7.64	32.51	9.8		57.7
5/6/2015	6.56	1.03	3.36	360	412	7.26				57.7
5/7/2015	6.62	1.28	3.26			7.51				56.7
5/8/2015	5.46	1.25	3.13			7.41				57.9
5/9/2015	5.76	1.17	3.23							
5/10/2015	5.92	1.05	3.36							
5/11/2015	5.85	1.09	3.43	360	580	7.38				59.8
5/12/2015	6.03	1.17	3.25	420	548	7.70	45.60	12.9		61.0
5/13/2015	5.67	1.25	3.37	400	548	7.72				59.3
5/14/2015	6.00	1.07	3.34			7.37				57.8
5/15/2015	7.99	1.15	2.98			7.40				58.5
5/16/2015	5.41	0.91	2.93							
5/17/2015	5.81	0.82	2.97							
5/18/2015	5.32	0.82	3.27	410	623	7.69				60.9
5/19/2015	5.50	0.96	3.06	340	482	7.23	37.71	11.5		60.3
5/20/2015	5.57	0.98	3.02	390	477	7.48				59.8
5/21/2015	10.74	0.97	2.84			7.17				59.3
5/22/2015	5.11	0.79	2.72			7.12				
5/23/2015	5.61	0.67	2.66							
5/24/2015	5.03	0.70	2.64							
5/25/2015	5.79	0.63	2.63	310	445					
5/26/2015	5.54	0.73	2.95	420	642	7.78	42.51	11.7		62.3
5/27/2015	6.32	0.51	2.90	390	526	7.31				63.3
5/28/2015	5.52	0.88	2.69			7.20				62.8
5/29/2015	5.49	0.65	2.48			7.38				64.3
5/30/2015	5.29	0.61	2.60							
5/31/2015	5.17	0.81	2.86							
6/1/2015	5.81	0.84	3.62	260	405	7.63				61.8
6/2/2015	5.59	1.84	3.39	380	498	7.43	38.68	12		61.2
6/3/2015	6.58	1.26	3.47	360	495	7.40				61.2
6/4/2015	5.32	1.17	3.02			7.13				61.9
6/5/2015	5.73	0.93	2.85			7.39				61.6
6/6/2015	5.31	0.93	2.75							
6/7/2015	5.36	0.75	3.69							
6/8/2015	5.11	0.83	2.27	420	673	7.86				62.3
6/9/2015	5.52	0.98	3.01	410	594	7.94	41.57	12.2		64.3
6/10/2015	5.32	0.96	2.86	370	570	7.44				63.6
6/11/2015	5.13	0.83	2.76			7.48				63.4
6/12/2015	5.21	0.76	2.57			7.87				65.6
6/13/2015	4.95	0.66	2.56							
6/14/2015	4.76	0.58	3.07							
6/15/2015	5.88	0.63	2.81	290	503	7.56				64.1
6/16/2015	4.91	0.91	2.88	410	570	7.55	42.74	14.4		64.2
6/17/2015	5.46	0.92	2.91	400	528	7.48				65.7
6/18/2015	3.67	0.98	2.63			7.33				63.8
6/19/2015	6.00	1.91	2.61			7.38				64.6

Date	Daily Flow			BOD (5-day)	Suspended Solids	pH	TKN	Total P	Temp.	Alkalinity
	Max.	Min.	Total	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Prim.
	mgd			mg/l			mg/l			Eff.
	Daily			Daily			Daily			Monthly
6/20/2015	5.60	0.76	2.75							
6/21/2015	5.87	1.06	3.37							65.4
6/22/2015	5.51	0.95	2.80	340	532	7.66				67.3
6/23/2015	5.77	1.03	3.24	370	568	7.60	43.31	11.2		66.6
6/24/2015	4.89	1.10	2.80	440	472	7.64				65.3
6/25/2015	5.30	0.86	2.57			7.37				64.7
6/26/2015	5.70	0.88	2.57			7.57				130
6/27/2015	5.16	0.86	2.98							
6/28/2015	5.35	1.09	2.68	240	321					64.1
6/29/2015	5.28	0.96	3.04	320	438	7.65	41.95	9.2		64.6
6/30/2015	5.27	0.90	2.89	380	465	7.49				64.9
7/1/2015	5.01	0.49	2.97			7.43				64.9
7/2/2015	5.26	1.91	2.63			7.29				64.8
7/3/2015	5.29	0.89	2.68							
7/4/2015	4.86	0.76	2.33							
7/5/2015	5.06	0.73	2.65							
7/6/2015	5.30	0.79	2.82	290	438	7.63				66.3
7/7/2015	5.32	0.84	2.80	300	395	7.26	35.79	10		67.4
7/8/2015	5.21	0.86	2.78	300	411	7.51				68.2
7/9/2015	4.92	0.43	2.62			7.27				66.2
7/10/2015	4.68	0.92	2.39			7.13				67.7
7/11/2015	5.77	0.58	2.50							
7/12/2015	4.91	0.61	2.54							
7/13/2015	5.47	0.67	2.67	240	383	7.78				67.3
7/14/2015	4.96	0.79	2.61	410	487	7.73	43.84	13.7		68.7
7/15/2015	4.94	0.77	2.54	410	404	7.30				70.1
7/16/2015	4.73	0.59	2.40			7.70				68.6
7/17/2015	4.80	0.48	2.29			7.15				67.1
7/18/2015	4.67	0.54	2.34							132
7/19/2015	5.50	0.70	2.76							
7/20/2015	5.43	1.73	2.25	300	406	7.62				68.6
7/21/2015	5.27	0.54	2.43	300	358	7.29	37.69	12		68.6
7/22/2015	4.07	0.55	2.42	420	364	7.20				68.0
7/23/2015	4.49	0.46	2.14			7.51				68.7
7/24/2015	4.51	0.55	2.28			7.94				68.8
7/25/2015	4.57	0.58	2.15							
7/26/2015	4.66	0.46	2.42							
7/27/2015	5.26	1.62	2.85	310	361	7.34				69.2
7/28/2015	5.59	0.61	2.62	280	433	7.04	45.52	20		70.5
7/29/2015	4.46	0.60	2.32	290	368	7.35				72.2
7/30/2015	5.77	0.54	2.47			7.92				70.4
7/31/2015	4.14	0.45	2.05			7.46				69.6
8/1/2015	4.60	0.43	2.25							
8/2/2015	4.85	0.44	2.18							
8/3/2015	4.89	0.38	2.64	320	440	7.32				70.9
8/4/2015	4.23	0.46	1.81	380	441	7.21	46.10	8.3		70.4
8/5/2015	5.07	0.38	2.32	270	316	7.43				69.3
8/6/2015	4.52	0.38	2.06			7.61				68.5
8/7/2015	5.08	0.38	2.24			7.91				69.7
8/8/2015	4.69	0.41	2.05							188
8/9/2015	4.45	0.35	2.38							
8/10/2015	5.26	0.39	2.29	310	465	7.40				71.0
8/11/2015	5.27	0.55	2.54	370	450	7.47	43.16	21		70.7
8/12/2015	5.20	0.54	2.28	380	415	7.31				71.0
8/13/2015	4.67	0.44	2.13			7.86				70.7
8/14/2015	4.75	0.36	2.11			7.75				70.2
8/15/2015	5.12	0.42	2.19							
8/16/2015	4.17	0.45	2.28							
8/17/2015	5.14	0.41	2.64	360	453	7.76				70.8
8/18/2015	5.28	0.46	2.17	370	498	7.44	40.99	13.4		71.5
8/19/2015	5.05	0.46	2.35	300	414	7.64				72.7
8/20/2015	4.69	0.31	2.21			7.41				71.4
8/21/2015	4.04	0.26	2.02			7.55				72.9
8/22/2015	4.45	0.35	2.16							
8/23/2015	4.72	0.36	2.48							
8/24/2015	4.43	0.37	2.30	290	429	7.56				71.4
8/25/2015	4.74	1.67	2.34	320	410	7.20	41.21	11.7		71.7
8/26/2015	5.12	0.51	2.44	300	400	7.40				71.3
8/27/2015	4.24	0.38	2.09			7.57				70.2
8/28/2015	4.44	0.33	2.21			7.15				71.5
8/29/2015	4.58	0.25	2.07							
8/30/2015	5.33	0.36	2.40							
8/31/2015	4.96	0.32	2.44			7.94				72.0
9/1/2015	4.96	0.49	2.28	330	477	7.27	51.15	24.1		72.3
9/2/2015	4.59	0.51	2.30	320	405	7.71				72.2
9/3/2015	5.25	0.53	2.15			7.39				71.9
9/4/2015	4.27	0.29	2.00			7.45				71.6
9/5/2015	4.42	0.23	2.00							178
9/6/2015	4.40	0.22	1.92							
9/7/2015	4.97	0.33	2.31							
9/8/2015	4.34	0.29	2.35	310	467	7.87				71.7
9/9/2015	4.65	0.45	2.23	330	562	7.69	47.49	17.9		72.7
9/10/2015	5.26	0.41	2.62	390	593	7.54				71.4
9/11/2015	4.47	0.80	2.16			7.48				69.3
9/12/2015	4.56	0.36	2.18							
9/13/2015	5.64	0.41	2.42							
9/14/2015	5.25	0.37	2.36	390	472	7.52				70.8
9/15/2015	4.98	0.54	2.36	340	418	7.17	43.80	13.8		70.9
9/16/2015	4.17	1.30	2.18	340	335	7.15				69.8
9/17/2015	5.18	0.31	2.14			7.75				70.1
9/18/2015	4.21	0.34	2.36			7.34				71.2
9/19/2015	4.24	0.40	1.84							
9/20/2015	4.33	0.32	2.44							
9/21/2015	4.34	0.31	2.11	330	455	8.02				69.4
9/22/2015	4.64	0.30	2.59	340	440	7.68	51.40	11.2		68.4
9/23/2015	4.52	0.36	1.87	280	327	8.21				69.2
9/24/2015	4.64	0.49	2.15			7.51				69.8
9/25/2015	4.04	0.34	2.15			7.32				70.2
9/26/2015	5.57	0.38	2.23							
9/27/2015	4.37	0.29	2.16							

Date	Daily Flow			BOD (5-day)	Suspended Solids	pH	TKN	Total P	Temp.	Alkalinity
	Max.	Min.	Total	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Prim.
	mgd			mg/l			mg/l			Eff.
	Daily			Daily			Daily			Monthly
9/28/2015	5.25	0.39	2.33	270	415	7.90				69.2
9/29/2015	4.14	1.52	2.53	280	390	7.37	42.85	15.4		70.9
9/30/2015	7.02	0.64	2.53	280	382	7.44				71.3
10/1/2015	4.30	0.53	2.24			7.39				69.5
10/2/2015	4.71	0.40	2.18			7.74				67.9
10/3/2015	4.79	0.41	2.25							
10/4/2015	4.65	0.42	2.39							
10/5/2015	4.42	0.36	2.42	350	501	8.08				65.6
10/6/2015	4.99	0.59	2.46	410	602	7.61	51.39	13.1		68.2
10/7/2015	4.64	0.51	2.24	530	598	8.2				68.4
10/8/2015	4.45	0.73	2.20			7.52				66
10/9/2015	4.34	0.34	2.12			7.83				68
10/10/2015	5.02	0.43	2.20							
10/11/2015	4.81	0.37	2.21							
10/12/2015	5.14	0.41	2.58							
10/13/2015	5.30	0.55	2.20	370	523	7.79				68
10/14/2015	5.63	0.53	2.30	360	663	7.73	51.8	15.1		66.7
10/15/2015	4.39	0.39	2.15	500	602	7.83				65.6
10/16/2015	4.85	0.34	2.57			7.52				65.6
10/17/2015	5.48	0.34	1.72							
10/18/2015	4.93	0.29	2.31							
10/19/2015	4.72	0.24	2.22	330	381	7.66				63.1
10/20/2015	4.56	0.32	2.09	390	495	7.36	52.2	8.90		64.3
10/21/2015	5.08	0.32	2.15	380	410	8.2				66.1
10/22/2015	4.24	0.35	2.06			8.15				66.3
10/23/2015	5.47	0.31	2.30			8.27				66.9
10/24/2015	4.44	0.22	1.80							
10/25/2015	4.77	0.43	2.27							
10/26/2015	4.73	0.38	2.16	340	463	8.27				64.1
10/27/2015	5.34	0.55	2.53	320	363	7.73	47.22	12.90		63.4
10/28/2015	6.15	0.83	3.02	300	356	8.04				64.9
10/29/2015	5.73	1.05	2.63			8.54				66.1
10/30/2015	6.41	0.70	2.55			7.9				64.8
10/31/2015	5.84	0.66	2.67							
11/1/2015	5.47	0.57	2.86							
11/2/2015	5.36	0.61	2.71	400	488	7.74				63.4
11/3/2015	5.30	0.79	2.40	350	453	7.98	42.11	14.70		64.3
11/4/2015	6.45	0.43	2.35	300	373	7.83				65
11/5/2015	4.44	0.50	2.07			7.77				65.2
11/6/2015	5.20	0.37	2.03			7.54				66
11/7/2015	4.85	0.27	2.13							
11/8/2015	5.87	0.28	2.30							
11/9/2015	4.61	0.32	2.16	310	380	8.19				64
11/10/2015	5.74	0.34	2.24			7.86				64.1
11/11/2015	5.32	0.32	2.68	340	381		45.84	8.60		
11/12/2015	5.26	0.36	1.81	370	361	7.42				62.9
11/13/2015	5.85	0.33	2.09			8.03				63.6
11/14/2015	5.19	0.40	2.17							
11/15/2015	5.65	0.31	2.49							
11/16/2015	5.69	0.38	2.43	310	393	8.31				62.6
11/17/2015	5.10	0.52	2.23	280	363	7.67	44.22	14.50		61.7
11/18/2015	4.99	0.44	2.27	300	329	8.09				63
11/19/2015	5.29	0.45	1.87			7.55				63
11/20/2015	4.69	0.70	2.08			7.72				63.1
11/21/2015	5.14	0.42	2.28							
11/22/2015	5.26	0.39	2.47	353	268					
11/23/2015	5.53	0.42	2.28	500	454	8.26	51.47	10.90		61.6
11/24/2015	5.16	0.27	2.20	390	362	7.53				60.4
11/25/2015	5.26	0.32	2.29			7.52				59.9
11/26/2015	5.95	0.35	2.18							
11/27/2015	5.11	0.31	2.26							
11/28/2015	5.34	0.38	2.15							
11/29/2015 *	*		2.48							
11/30/2015	5.20	1.50	2.33	218	355	7.88				61
12/1/2015	5.20	0.50	2.47	320	352	8.36	45.34	11.82		59.3
12/2/2015	5.81	1.16	2.39	340	355	7.59				61.4
12/3/2015	4.98	1.51	2.43			7.67				60.5
12/4/2015	5.44	0.42	1.96			8.19				60
12/5/2015	5.73	0.33	2.24							
12/6/2015	5.68	0.32	2.49							
12/7/2015	5.68	0.38	2.38	320	469	8.14				59.6
12/8/2015	5.18	0.48	2.33	360	408	7.72	48.10	13.10		59.9
12/9/2015	5.51	0.59	2.54	330	351	7.73				60.8
12/10/2015	5.07	0.34	1.92			7.71				61.1
12/11/2015	5.82	0.38	2.15			7.51				58.2
12/12/2015	5.72	0.39	2.33							
12/13/2015	5.12	0.38	2.48							
12/14/2015	5.89	0.36	2.54	300	411	7.69				60.3
12/15/2015	5.34	0.68	2.74	320	400	7.79	47.00	10.00		60.6
12/16/2015	5.91	0.57	2.31	360	315	8.03				60.6
12/17/2015	6.01	0.71	2.84			7.43				59.6
12/18/2015	5.51	0.80	2.52			7.36				60.4
12/19/2015	6.51	0.72	2.71							
12/20/2015	5.85	0.69	3.00							
12/21/2015	6.32	0.67	2.72	345	336	7.54				57.9
12/22/2015	5.75	0.58	2.66	345	300	7.95	46.30	6.50		60.3
12/23/2015	5.88	0.76	2.95	293	313	7.64				60.3
12/24/2015	6.51	0.92	2.95			7.64				58.7
12/25/2015	5.89	0.84	2.66							
12/26/2015	6.17	0.76	2.83							
12/27/2015	11.55	0.80	2.94							
12/28/2015	5.65	0.79	3.09	360	395	7.79				59.8
12/29/2015	6.06	1.00	3.11	360	398	7.21	51.60	12.50		57.5
12/30/2015	6.11	1.07	3.40	430	421	7.65				57.7
12/31/2015	5.93	0.98	2.69			8.19				58.7
1/1/2016	6.41	0.92	2.80							
1/2/2016	6.70	0.87	2.99							
1/3/2016	7.07	0.92	3.26							
1/4/2016	5.76	0.84	2.99	290	391	7.44				55.9
1/5/2016	6.43	1.02	3.09	330	361	7.62	41.70	11.10		56

Date	Daily Flow			BOD (5-day)	Suspended Solids	pH	TKN	Total P	Temp.	Alkalinity
	Max.	Min.	Total	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Prim.
	mgd Daily			mg/l Daily	mg/l Daily	S. U. Work Day	mg/l Weekly	mg/l Weekly	* F Work Day	mg/l Monthly
1/6/2016	6.02	1.03	2.98	310	361	7.83			56.5	
1/7/2016	6.34	0.51	2.66			8.2			56.9	
1/8/2016	5.29	0.45	2.28			7.81			57.4	
1/9/2016	5.54	0.45	2.45							
1/10/2016	6.07	0.47	3.01							
1/11/2016	5.36	0.58	2.70	300	385	8.1			56.9	
1/12/2016	5.46	0.76	2.63	340	295	7.77	37.10	9.19	56.4	
1/13/2016	4.84	0.79	2.54	390	304	7.82			56.1	
1/14/2016	4.85	0.58	2.50			7.94			55.7	
1/15/2016	4.84	0.58	2.40			7.31			56.3	
1/16/2016	5.75	0.61	2.69							
1/17/2016	6.02	0.31	2.74							
1/18/2016	5.24	0.63	2.88							
1/19/2016	5.22	0.30	1.89	350	270	7.67			56.4	
1/20/2016	5.37	0.82	2.66	290	305	7.47	37.80	9.94	55.4	
1/21/2016	5.22	0.60	2.45	390	275	7.32			55.6	168
1/22/2016	5.00	0.51	2.34			8			55.2	
1/23/2016	4.97	0.57	2.45							
1/24/2016	5.46	0.50	2.64							
1/25/2016	5.06	0.47	2.43	290	254	7.62			55.5	
1/26/2016	5.26	0.51	2.64	360	288	7.24	39.30	5.50	55.2	
1/27/2016	4.92	0.82	2.56	330	253	7.73			55.6	
1/28/2016	5.02	0.55	2.39			7.57			55.7	
1/29/2016	4.81	0.48	2.38			7.4			55.8	
1/30/2016	5.28	0.45	2.75							
1/31/2016	5.12	1.70	2.26							
2/1/2016	5.12	0.42	2.51	290	269	8			56.1	
2/2/2016	5.55	0.61	2.65	330	332	7.93	42.80	10.30	55.8	
2/3/2016	5.21	0.60	2.44	330	302	7.65			56	
2/4/2016	4.74	0.60	2.44			7.5			56.3	
2/5/2016	4.86	0.49	2.42			7.66			53.2	
2/6/2016	5.71	0.50	2.54							
2/7/2016	5.22	0.57	2.79							
2/8/2016	5.29	0.57	2.72	285	249	7.67			54	
2/9/2016	4.92	0.71	2.67	255	187	7.68	45.70	8.17	54.9	
2/10/2016	5.14	0.75	2.63	383	281	7.64			55	
2/11/2016	4.73	0.84	2.38			7.84			54.6	
2/12/2016	5.09	0.62	2.38			7.56			54.4	
2/13/2016	5.31	0.64	2.57							
2/14/2016	5.47	0.63	2.71							
2/15/2016	5.38	0.57	3.01							
2/16/2016	6.18	0.87	3.32	300	295	7.3			54.2	
2/17/2016	7.40	1.19	3.01	285	244	7.77	20.20	5.77	54.7	140
2/18/2016	5.65	0.98	2.96	240	211	7.96			53.9	
2/19/2016	5.70	0.99	2.83			7.52			54.1	
2/20/2016	5.84	0.93	2.93							
2/21/2016	5.96	0.87	3.15							
2/22/2016	5.63	0.87	2.97	135	110	7.77			55	
2/23/2016	5.33	0.93	3.00	248	283	7.61			52.7	
2/24/2016	6.60	1.19	4.45	203	253	8	31.70	7.88	54.7	
2/25/2016	9.16	2.39	4.61			7.26			53.4	
2/26/2016	7.23	2.59	4.61			7.73			52	
2/27/2016	11.98	2.31	4.30							
2/28/2016	7.82	1.80	4.53							
2/29/2016	7.65	2.04	4.04	323	251	7.66			53.7	
3/1/2016	6.63	1.99	3.95	204	213	7.64	27.00	6.09	52.2	
3/2/2016	7.18	0.94	3.70	203	279	7.37			53.8	
3/3/2016	6.81	1.74	4.28			7.64			52.4	
3/4/2016	6.41	1.70	3.55			7.36			53.9	
3/5/2016	6.64	1.54	3.67							
3/6/2016	6.47	1.45	3.69							
3/7/2016	5.91	1.43	3.62	210	270	7.39			54.1	
3/8/2016	5.85	1.42	3.56	240	273	7.51	28.00	8.41	54.7	
3/9/2016	6.23	1.46	3.40	218	278	7.21			54.8	
3/10/2016	6.59	1.24	3.34			7.64			55.3	
3/11/2016	5.74	1.25	3.18			7.55			54.8	
3/12/2016	6.15	1.11	3.40							
3/13/2016	5.82	1.15	3.40							
3/14/2016	5.53	1.01	3.08	218	294	7.63			56.1	
3/15/2016	5.29	1.38	3.26	203	233	7.65	3.70	4.08	54.4	
3/16/2016	5.97	1.15	3.19	270	261	7.71			54.9	
3/17/2016	6.02	1.05	3.07			7.49			55.1	
3/18/2016	6.21	1.06	3.10			7.5			55.1	130
3/19/2016	6.31	0.95	3.09							
3/20/2016	6.10	0.89	3.25							
3/21/2016	5.95	0.90	3.33	290	354	7.57			54.3	
3/22/2016	5.49	1.12	3.21	315	390	7.49	31.50	7.37	55.6	
3/23/2016	5.82	1.06	2.88	285	328	7.7			56.2	
3/24/2016	6.18	0.91	2.99			7.58			55.4	
3/25/2016	5.98	0.93	3.09							
3/26/2016	6.18	0.87	3.03							
3/27/2016	5.97	0.75	2.97							
3/28/2016	6.11	0.86	3.58	255	365	7.69			55.3	
3/29/2016	6.38	1.06	3.49	285	449	7.87	38.20	10.30	54.7	
3/30/2016	6.00	1.00	3.02	270	370	7.34			54.8	
3/31/2016	5.87	0.98	3.14			7.68			56.1	
4/1/2016	6.37	1.23	3.22			7.32			57.4	
4/2/2016	5.85	1.17	3.17							
4/3/2016	6.27	1.12	3.49							
4/4/2016	6.39	1.30	3.54	270	325	7.96			54.7	
4/5/2016	6.54	1.44	4.31	338	350	7.55	36.50	8.71	53.9	
4/6/2016	5.86	1.46	3.03	323	501	7.45			54.3	116
4/7/2016	6.81	1.43	4.20			7.43			55.7	
4/8/2016	6.62	1.97	4.12			7.73			55.3	
4/9/2016	7.19	1.89	4.20							
4/10/2016	6.76	1.65	4.25							
4/11/2016	6.95	1.68	4.00	290	438	7.47			55	
4/12/2016	7.55	1.76	4.37	240	341	7.61	28.20	9.44	56	
4/13/2016	11.98	1.76	3.46			7.41			55.3	
4/14/2016	7.06	1.67	3.71	248	293	7.48			55.3	

Date	Daily Flow			BOD (5-day)	Suspended Solids	pH	TKN	Total P	Temp.	Alkalinity
	Max.	Min.	Total	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Prim.
	mgd			mg/l	mg/l	S. U.	mg/l	mg/l	° F	Eff.
	Daily			Daily	Daily	Work Day	Weekly	Weekly	Work Day	Monthly
4/15/2016	6.06	1.53	3.30			7.34			55.5	
4/16/2016	6.23	1.39	3.58							
4/17/2016	6.45	1.38	3.58							
4/18/2016	6.52	1.27	3.92	280	414	7.46			56.6	
4/19/2016	6.03	1.38	3.38	310	380	7.51	31.70	11.40	57	
4/20/2016	6.48	1.35	3.28	310	363	7.5			57	
4/21/2016	6.68	1.13	3.88			7.6			56.9	
4/22/2016	5.88	1.06	2.60			7.21			58.1	
4/23/2016	6.28	1.20	3.36							
4/24/2016	6.03	1.03	3.24							
4/25/2016	6.45	1.03	3.61	290	405	7.58			57.5	
4/26/2016	5.61	1.14	3.01			7.56			57.6	
4/27/2016	5.14	1.31	3.46	260	311	7.48	31.90	3.75	57.9	
4/28/2016	6.43	1.15	2.93	340	379	7.55			58.2	
4/29/2016	5.16	0.98	3.02			7.66			58.5	
4/30/2016	5.83	0.85	2.94							
5/1/2016	5.55	0.82	3.49							
5/2/2016	6.18	0.86	2.83	280	325	7.72			58.5	
5/3/2016	6.03	1.02	3.20	250	258	7.43	32.90	37.40	58.7	
5/4/2016	5.83	1.04	3.29	270	303	7.4			57.7	
5/5/2016	5.97	0.93	3.00			7.44			58.4	
5/6/2016	6.34	1.01	2.95			7.7			58.3	
5/7/2016	5.20	0.97	3.09							
5/8/2016	5.94	0.98	3.33							
5/9/2016	5.80	0.98	3.25	270	316	7.69			59.8	
5/10/2016	5.97	1.00	3.28	250	270	7.59	32.00	35.70	59.5	
5/11/2016	5.81	1.11	3.05	280	256	7.52			59.7	
5/12/2016	5.93	1.56	3.26			7.85			58.5	172
5/13/2016	6.22	0.98	2.74			7.32			60.6	
5/14/2016	5.90	0.99	2.85							
5/15/2016	6.28	0.85	3.23							
5/16/2016	6.27	0.83	3.06	290	328	7.67			58.5	
5/17/2016	6.17	0.95	3.15	300	323	7.68	32.00	10.60	60.8	
5/18/2016	5.62	1.05	2.91			7.52			60.3	
5/19/2016	6.08	0.73	2.82	320	272	7.32			61.1	
5/20/2016	6.50	0.65	2.77			7.46			59.9	
5/21/2016	5.83	0.73	2.67							
5/22/2016	5.64	0.72	2.98							
5/23/2016	5.96	0.66	2.95	300	372	7.86			62.2	
5/24/2016	6.18	0.85	2.98	450	420	7.44	38.20	11.20	62.2	
5/25/2016	5.62	0.82	2.66	410	366	7.57			62.9	
5/26/2016	5.10	0.49	2.75			7.29			63.6	
5/27/2016	5.16	0.57	2.47			7.4			66.3	
5/28/2016	5.18	0.65	2.59							
5/29/2016	5.45	0.51	2.39							
5/30/2016	5.86	0.57	3.29							
5/31/2016	5.99	0.53	2.28	280	340	7.78			64.6	
6/1/2016	5.55	0.78	2.95	410	406	7.45	34.20	13.80	64.2	
6/2/2016	5.75	0.72	2.81	460	419	7.57			64.1	
6/3/2016	5.91	0.96	2.63			7.51			63.6	
6/4/2016	5.33	0.57	2.47							
6/5/2016	5.97	0.56	3.28							
6/6/2016	6.40	0.60	2.58	390	543	7.64			64.9	194
6/7/2016	5.46	0.74	2.71	310	388	7.52	37.60	42.50	65.7	
6/8/2016	5.32	0.71	2.53	400	375	7.65			64.4	
6/9/2016	5.96	0.57	3.00			7.65			63.3	
6/10/2016	6.04	0.78	2.65			7.76			64.1	
6/11/2016	5.79	0.66	2.84							
6/12/2016	5.56	0.73	2.76							
6/13/2016	5.84	0.79	3.45	350	430	7.23			65.4	
6/14/2016	5.45	0.85	2.60	370	502	7.5	41.70	16.20	65.5	
6/15/2016	5.83	0.79	3.07	510	515	7.64			65.3	
6/16/2016	5.04	0.43	2.75			7.43			65.3	
6/17/2016	5.32	0.65	2.63			7.8			65.7	
6/18/2016	5.68	0.64	2.67							
6/19/2016	5.30	0.58	2.65							
6/20/2016	6.03	0.66	3.08	330	445	8.04			66.2	
6/21/2016	5.32	0.87	2.76	500	595	7.32	43.60	15.10	67.7	
6/22/2016	4.95	0.43	2.58	340	431	7.89			67.1	
6/23/2016	5.62	0.74	2.39			7.53			66.6	
6/24/2016	5.52	0.54	2.33			7.26			66.4	
6/25/2016	5.69	0.52	2.25							
6/26/2016	4.22	0.48	2.47							
6/27/2016	5.49	0.56	2.70	390	546	7.57			67.5	
6/28/2016	4.25	0.81	2.68	350	438	7.22	44.50	15.00	67.7	
6/29/2016	6.57	0.81	2.65	410	415	7.57			69	
6/30/2016	4.32	0.66	2.44			7.81			67.5	
7/1/2016	4.65	0.65	2.48			7.24			68.5	
7/2/2016	4.36	0.72	2.39							
7/3/2016	4.43	0.64	2.27							
7/4/2016	4.41	0.62	2.45							
7/5/2016	4.55	0.84	2.56	390	533	7.59			67.3	
7/6/2016	4.47	0.68	2.46	360	370	7.77	49.60	8.83	67.7	
7/7/2016	4.79	0.52	2.53	390	439	7.68			68.8	
7/8/2016	4.80	0.67	2.54			7.7			67.7	
7/9/2016	4.57	0.58	2.51							
7/10/2016	5.45	0.71	2.73							
7/11/2016	4.78	0.67	2.72	470	595	7.7			68.6	
7/12/2016	5.09	0.88	2.78	440	588	7.4	49.20	16.20	69.2	
7/13/2016	5.14	0.82	2.63	480	565	7.25			69	
7/14/2016	5.49	0.72	2.75			6.82			70.5	
7/15/2016	4.72	0.65	2.43			7.82			70	
7/16/2016	5.65	0.65	2.42							
7/17/2016	5.56	0.62	2.54							
7/18/2016	5.67	0.60	2.64	1260	1497	7.65			71.1	
7/19/2016	5.62	0.83	2.68	500	613	7.53	47.10	14.50	71.1	
7/20/2016	6.00	0.80	2.54	560	566	7.64			69.8	
7/21/2016	6.45	0.60	2.45			7.54			70	
7/22/2016	5.67	0.62	2.50			7.4			70	240
7/23/2016	6.19	0.55	2.42							

Date	Daily Flow			BOD (5-day)	Suspended Solids	pH	TKN	Total P	Temp.	Alkalinity
	Max.	Min.	Total	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Prim.
	mgd			mg/l	mg/l	S. U.	mg/l	mg/l	° F	Eff.
	Daily			Daily	Daily	Work Day	Weekly	Weekly	Work Day	Monthly
7/24/2016	5.19	0.54	2.47							
7/25/2016	5.77	0.63	2.53	300	398	7.5			70	
7/26/2016	5.36	0.61	2.77	390	388	7.46	51.40	8.41	72.6	
7/27/2016	6.01	1.10	2.90	360	566	7.4			71.4	
7/28/2016	4.81	0.86	2.64			7.42			71.9	
7/29/2016	6.77	0.67	2.46			7.4			71.6	
7/30/2016	4.42	0.59	2.41							
7/31/2016	4.54	0.59	2.63							
8/1/2016	5.16	0.65	2.50	370	383	7.68			71	
8/2/2016	5.11	0.61	2.52	450	525	7.72	55.8	11.2	71	
8/3/2016	4.37	0.57	2.45	460	346	7.7			71.2	
8/4/2016	4.69	0.66	2.55			7.68			70.5	
8/5/2016	4.37	0.57	2.44			7.4			71.2	196
8/6/2016	5.05	0.67	2.51							
8/7/2016	5.37	0.56	2.43							
8/8/2016	5.95	0.60	2.51	470	360	7.65			71.1	
8/9/2016	6.04	0.68	2.48	540	502	7.33	54.7	7.86	70.8	
8/10/2016	5.90	0.62	2.69	560	465	7.17			71.1	
8/11/2016	5.12	0.68	2.65			7.37			71.4	
8/12/2016	5.04	0.75	2.56			7.51			71.3	
8/13/2016	7.38	0.67	2.70							
8/14/2016	5.24	0.79	2.58							
8/15/2016	5.52	0.71	2.79	300	460	7.7			71.9	
8/16/2016	5.30	0.86	2.68	390	407	7.77	49.9	21.6	72.7	
8/17/2016	6.52	0.80	2.85	380	481	7.18			71.8	
8/18/2016	6.67	0.92	2.82			7.65			73.3	
8/19/2016	5.63	0.75	2.64			8.07			74.2	
8/20/2016	4.58	0.65	2.47							
8/21/2016	6.23	0.65	2.92							
8/22/2016	6.88	0.81	2.85	420	647	7.4			74.1	
8/23/2016	6.83	0.92	2.85	380	557	7.36	53.8	13.4	71.8	
8/24/2016	6.24	0.86	2.90	840	1,240	7.3			72.4	
8/25/2016	6.11	0.72	2.62			7.78			71.9	
8/26/2016	5.20	0.66	2.56			7.14			71.8	
8/27/2016	4.53	0.61	2.48							
8/28/2016	4.80	0.60	2.61							
8/29/2016	4.96	0.63	2.66	390	618	7.7			74	
8/30/2016	4.74	0.91	2.85	350	490	7.48	59	22.3	73.1	
8/31/2016	6.17	1.56	2.82	330	390	7.46			73.3	