

ADDENDUM NO. 6
TO THE CONTRACT DOCUMENTS
for the construction of

Date: July 27, 2017
Project No.: 674010

**W.B. CASEY WATER RECLAMATION FACILITY POLISHING
PLANT AND WAS THICKENING UPGRADES**

CLAYTON COUNTY WATER AUTHORITY
CLAYTON COUNTY, GEORGIA

To All Planholders and/or Prospective Bidders:

The following changes, additions, and/or deletions are hereby made a part of the Contract Documents for the construction of the W.B. Casey Water Reclamation Facility Polishing Plant and WAS Thickening Upgrades dated May, 2017 as fully and completely as if the same were fully set forth therein:

A. CLARIFICATIONS

1. Question: Section 00 21 13 Part 1.14 says, "The work under these Bidding documents is to be paid for by public funds; therefore, minimum prevailing wage rates published by the state are applicable." Is this project subject to Davis Bacon requirements?

Response: There is no federal funding of this work and therefore this project is not subject to David-Bacon.

2. Question: Will the Owner be responsible be responsible of draining the DAF Tanks and disposing of any residual sludge? If not, what quantity of sludge should the Contractor assume requires disposal? Can the sludge be disposed of into some other on-site process?

Response: Yes. The Owner will be responsible for draining the DAF tanks and disposal of the sludge to the on-site process.

3. Question: Is there is an existing and proposed grading plan cad file available to the contractors?

Response: CAD files will not be shared until after the Contract is awarded.

4. Question: Referencing Spec Section 03 30 00 Supplement & 03 30 00.2.03.D: Which mix designs listed in 03 30 00.3.15.A require the shrinkage testing and limits stated in 03 30 00.2.03.D?

Response: MIX DESIGN CLASS 5000F3S1P2C2, per Supplement 1,C,3 and MIX DESIGN CLASS CF00F1S1P0C1, per Supplement 4,C,3.

5. Question: Referencing Spec Section 03 15 00.3.07: Please advise as to if the manufacturer's representative for inspection and certification is required or if

this is handled by the Engineer's inspection, if required is this inspection the contractor's responsibility or covered in the field testing allowance?

Response: This is Contractor's responsibility. It is not covered in the field testing allowance.

6. Question: Referencing Spec Section 03 24 00.3.03: Same as above question but referencing fibrous reinforcement.

Response: This is Contractor's responsibility. It is not covered in the field testing allowance.

7. Question: Referencing Spec Section 03 63 00.3.03.A: Is it the Engineer's intent to require the Manufacturer's site trainings for concrete doweling?

Response: Yes. This is Contractor's responsibility.

8. Question: Section 46 66 20, Ultraviolet Disinfection Equipment, 2.05.B.3 Program functions, I/O addresses, and internal registers within PLCs shall be accessible by Owner's SCADA system. We will provide a set of registers relating to the system over SCADA. I/O addresses are provided on the Control Philosophy and can be directly mapped to SCADA list if needed. However, we don't know what is meant by "Program Functions". Please clarify.

Response: System as described is acceptable.

9. Question: Section 46 66 20, Ultraviolet Disinfection Equipment, 2.05.D.4: "Graphic Display Screens: Match configuration of plant control system workstations with respect to color usage conventions, general formatting, and screen navigation."

We have a standard set of display screens. Matching configuration of each plant control system would require redevelopment which would add considerable project specific cost.

Response: Manufacturer's standard display screen is acceptable.

10. Question: Section 46 66 20, Ultraviolet Disinfection Equipment, 2.07.C - Anchor Bolts: Type 316 SST, sized by equipment manufacturer.

Trojan will supply anchor bolts for banks only. Contractor to be responsible for all other anchor bolts.

Response: Manufacturer is responsible for anchor bolts for installation of banks/modules as per 1.01C.1.o. Contractor is responsible for all other anchor bolts as per 3.01B. All anchor bolts are to be 316 SST as per 2.02D.

11. Question: During the Secondary Effluent Splitter box tie in it was discussed that the bypassing will occur where the Secondary Clarifiers 54" Effluent Lines "meet" and then be discharged to the W3 Pump Station. Please advise as to the intended location the GC must pick up and intercept flows? Please collaborate on the intent of the engineer/owner as to where these flows need to be captured.

Response: There is currently no means of isolating the main effluent line. Therefore, bypass flow must be captured in the in the Secondary Clarifier boxes. Additional provisions have been added to Section 01 31 13, Project Coordination.

12. Question: Section 40 99 90, Package Control Systems, 1.01C10: Will IEC formatted electrical diagrams be acceptable if they provide the same information as can be found in Ladder diagrams?

Response: Yes.

13. Question: Section 40 99 90, Package Control Systems, 1.05B9: Will a control philosophy and the electrical schematics be acceptable to submit in lieu of Loop Wiring Diagrams? The information provided within the control philosophy is identical as what can be found in Loop Wiring Diagrams.

Response: Yes. Action Submittal 1.05B.9 will not be required if the information provided in control philosophy is the same.

14. Question: Section 46 66 20, Ultraviolet Disinfection Equipment, 1.04A: Is the HMI specified in paragraph 46 66 20-2.05D rated to operate at 21°F? Heaters inside the control panel may not provide sufficient heat to protect the exterior surfaces of an HMI.

Response: Ranges are 32 to 131 Operating and -13 to 158 degrees F Non-operating. We have used these HMIs here for many outdoor applications with no problems. This is okay.

15. Question: Section 46 66 20, Ultraviolet Disinfection Equipment, 1.04.H2.b: The UV Intensity sensor is not accessible while the UV module is submerged. For safety purposes, the UV lamps shut down when the modules are lifted out of the channel. Please remove the requirement that disinfection continue while the UV sensor is being checked for calibration.

Response: Requirement is removed. See edits to specification.

16. Question: Section 46 66 20, Ultraviolet Disinfection Equipment, 1.05A.19: Conduit layout drawings are not provided by Manufacturers as conduit layout is subject to local electrical codes. Please remove conduit layouts as a submittal requirement.

Response: Agreed. Remove "conduit layouts" from sentence.

17. Question: Section 46 66 20, Ultraviolet Disinfection Equipment, 2.04.B.14: The requirement for 16AWG analog wiring is applicable in 120V AC systems.

Wedeco utilizes a 24V DC control architecture and, therefore, uses 18AWG wires.

Response: This is acceptable. See edits to specification.

18. Question: Section 46 66 20, Ultraviolet Disinfection Equipment, 2.04D and 2.05.B: These two spec sections contradict each other. One calls for 304SS enclosures and the other 316SS for enclosures that are located next to each other. Please clarify the desired material of construction.

Response: 304 stainless steel. See edits to specification.

19. Question: Section 46 66 20, Ultraviolet Disinfection Equipment, 2.04.D.2: Is it acceptable to provide enclosures that are equipped with a lock and key instead of being capable of accepting a padlock as indicated in the spec?

Response: Manufacturer's standard is acceptable.

20. Question: Section 46 66 20, Ultraviolet Disinfection Equipment, 2.04.D.6: Please remove this requirement. Wedeco mounts the EcoTouch local controller onto the side panel within the enclosure. Please consider this acceptable. Mounting this device to the face of the door presents complications in Type 4X panels that makes this a less than desirable option.

Response: Requirement removed. See edits to specification.

21. Question: Section 46 66 20, Ultraviolet Disinfection Equipment, 2.04H.1.a: Be advised that lamp modulation is done at the Ballast Enclosures and not at the Master Control Panel as indicated in this section.

Response: Noted. This is acceptable.

22. Question: Section 46 66 20, Ultraviolet Disinfection Equipment, 2.05.D.2: Be advised that the Ballast Enclosures are not provided with an OIU. Overall control of the UV system is controlled at the Master Control Panel which will have the OIU.

Response: Noted. This is acceptable.

23. Question: Section 46 66 20, Ultraviolet Disinfection Equipment, 2.05E4.e: Wedeco provides a strict dose-paced control logic utilizing flow, UVT and UV intensity data to determine the correct power setting in order to achieve the desired dose. During the initial startup, all of the modules are turned on at 100% power in order to ensure the desired dose is immediately achieved. The control system will then lower the power setting and turn off any modules as required to lower power consumption.

Response: Noted. This is acceptable.

24. Question: Article 3.2.2. of the Agreement shows two different amounts (\$1,000 and \$1,500) for Liquidated Damages for failure to reach Final Completion. Which amount is correct?

Response: \$1,500. See below for edit to Section 00 52 00, Agreement.

25. Question: Article 6 of the Agreement states “Monies not paid when due as provided in Article 14 of the General Conditions shall bear interest at the rate to be negotiated between Owner and Contractor”. Please modify to read interest will be in accordance with the Georgia Prompt Pay Act, O.C.G.A. § 13-11-7.

Response: The language as provided is the current standard for CCWA and will not be further amended. The Georgia Prompt Pay Act, allows for terms and conditions to be modified including the interest rate.

26. Question: The Standard General Conditions of the Construction Contract is the Engineers Joint Contract Documents Committee (EJCDC) No. 1910-8 (1996 Edition). EJCDC has modified this document numerous times since 1996. The current EJCDC General Conditions, reflecting industry best practices, is the EJCDC C-700, Rev 1, dated 2013. Why does the project use unreasonably outdated industry standard documents?

Response: The 1996 version of the EJCDC is the current standard for CCWA.

27. Question: Current EJCDC guidelines state “During the drafting or negotiating process for the document, it is important that the two contracting parties are both aware of any changes that have been made to the Standard EJCDC Text. Thus, if a draft of the document purports to be or appears to be an EJCDC document, the user must plainly show all changes to the Standard EJCDC Text, using “Track Changes” (redline/strikeout), highlighting, or other means of clearly indicating additions and deletions.” Please confirm that all changes to the EJCDC General Conditions are shown by track-changes, or are addressed in the Supplementary Conditions.

Response: Yes, all modifications to the 1996 EJCDC are addressed in the Supplementary Conditions. CCWA certifies that no changes have been made to the standard EJCDC text.

28. Question: Why was the industry-standard language in General Conditions 4.03.A.1. and 2., concerning Differing Site Conditions deleted from the Contract Documents?

Response: General Conditions 4.03.A, as amended by the Supplemental Conditions, provide an industry standard definition for differing site conditions, and the Supplemental Conditions will not be further amended.

29. Question: Why was the industry-standard Owner's indemnification of Hazardous Environment Conditions at the Site deleted from the Contract Documents?

Response: Is it assumed that this question is in reference to SC-4.06.G.

The statement reflected in SC-4.06.G. is correct. Part of this Project requires the demolition of the DAF facility which was built in 1978. One of the conditions under which the "Owner shall indemnify and hold harmless" is that the Hazardous Environmental Conditions are "not indicated in Drawings and Specifications." Currently, there is no information available on whether hazardous materials will be present, and as such, there is nothing indicated in the Drawings or Specifications. While there are none currently known, there is the possibility that hazardous materials may be identified at a later date. If this is the case, a change will be made to account for additional scope required to hire a specialty contractor for abatement and removal of hazardous materials. It will be the Contractor's responsibility to properly manage the abatement and burden the risks associated with the work.

30. Question: Why was the industry-standard language in General Conditions 5.07.B., concerning the waiver of consequential damages due to perils covered by insurance deleted from the Contract Documents?

Response: This is the standard of CCWA. CCWA does not carry builders risk coverage that covers the Contractor as they complete work on CCWA property at an existing facility which has to maintain continuous operation.

31. Question: The Supplementary Conditions deleted GC 7.02 in its entirety. Who is responsible for the coordination of other contractors on the site?

Response: The General Contractor will be responsible for coordination of all work on the site related to that which is described in the Contract Documents.

32. Question: The Supplementary Conditions deleted GC 11.01.5 in its entirety. Please explain why the Contractor is not entitled to these Supplemental Costs.

Response: CCWA will delete Supplementary Condition 11.01.A.5.

33. Question: The Supplementary Conditions state (in several places) "OWNER AND ENGINEER MAKE NO REPRESENTATION OR WARRANTY OF ANY NATURE TO CONTRACTOR CONCERNING THE CONTRACT

DOCUMENTS”. We contend that this violates the Spearin, and that under law, the Contractor is entitled to rely upon the sufficiency and adequacy of the Contract Documents.

Response: The language in this provision is clear and unambiguous, and speaks for itself. The Owner makes no representation or warranty of any nature to Contractor concerning the contract documents.

34. Question: Please define “highest and best standards” as used in SC-6.01.A.

Response: We have no further definition to provide other than what is stated in the Contract Documents.

35. Question: SC-8.04.A. states in part “Owner and Contractor expressly agree that the terms of payment, payment period, and rates of interest herein shall control to the exclusion of any provisions set forth in the Georgia Prompt Pay Act, O.C.G.A. 13-11-1 et al, and the provisions of said Act are herein expressly waived”. We do not agree to this waiver of Georgia law.

Response: The language as provided is the current standard for CCWA and will not be further amended. The Georgia Prompt Pay Act, allows for terms and conditions to be modified including terms of payment, payment period, and rate of interest. .

36. Question: The number of adverse weather days cited in SC012.03 appears excessive. Please provide a baseline (NOAA or other industry standard) for the adverse weather days in this provision.

Response: See edits to Supplementary Conditions regarding edits to the adverse weather days.

37. Question: SC-14.02.A.1. modifies the General Conditions for Progress Payments. The last sentence of the provision references O.C.G.A.13-10-20 which addresses Bid Bonds. Why is this Georgia statute included under pay provisions?

Response: This is a typo. See edits to Supplementary Conditions.

38. Question: SC-16.01.A. implies that all disputes will be resolved by litigation. There is no reference to any alternate dispute resolution methods. Is this the Owner’s intent?

Response: This is the current standard of CCWA. CCWA does not intend to exclude the possibility of alternate dispute resolution methods. However, CCWA will not commit to a tiered approach for dispute resolution. This will be considered on a case by case basis.

39. Question: Specification 09 96 35-3.10.A references ‘existing’ submerged metal to receive a chemical resistant coating. The application schedule

references Facility 53, new Phosphorus Polishing structure. Please clarify which existing, submerged metal is to receive this coating.

Response: Disregard the word "existing." There is not existing submerged metal.

40. Question: Assuming the existing 60" SE and PLE is CLDI, can you confirm the manufacturer of the existing SE and PLE pipe and fittings in the area of the proposed tie-ins?

Response: Manufacturer of the piping could not be confirmed.

41. Question: During the pre-bid meeting there was mention that an onsite waste site for excess soil was available near the solids thickening facilities and the specific site would be clarified through addendum. Please confirm the location of the excess soil site.

Response: This information was provided in Addendum No. 4.

42. Question: The bid form includes a unit price under item A for Auger Cast Grout Piles (18 inch diameter) in the amount of 4290 LF as well as an Item B. 80 for Auger Cast Grout Piles (18 inch diameter) in the amount of 660 LF. Should the contractor include a second mobilization of the auger cast pile subcontractor to complete the work associated with the 660 LF of additional work if approved by the owner?

Response: The additional piles (660 LF) is meant to represent a contingency for pile length since the exact length required is determined during installation. This additional quantity in the unit price schedule is intended to cover any length beyond the estimated required 4290 LF for the pile installation at the phosphorus polishing facility. This is not intended to be a separate mobilization.

43. Question: In Section J, the formulae for J.8 and J.9 should multiply by 8,760 (it shows 8,761 and 8,762, respectively).

Response: Edit has been made. See attached.

44. Question: J.12 should multiply J.11 (Total Annual Power Usage) by the value in J.7 (Power Cost). It shows J.11 should multiply by J.10 (Power Usage at Minimum Flow).

Response: Edit has been made. See attached.

45. Question: Please provide Detail 3305-730 (DWG 05-Y-202) as it is not found in our details.

Response: See drawing 05-C-504. All civil discipline details are located in the Drawings (not the Standard Detail volume) to meet permitting requirements.

46. Question: Please provide valve specification for valves V122 and V142.

Response: See Section 40 27 02, Part 2.05.A.4 for V122 specification. The reference to V142 is an error. This should read "V122." Correction is indicated in drawing edit below.

47. Question: Drawing 42-C-201. Please confirm 422FV1 and 422FV2 are existing. They are shown as bold on this drawing.

Response: On 42-D-201, 422FV1 and 422FV2 are the existing Vaughan Chopper Pump Recirculation Valves. These two valves are to remain in place, the bold portion I believe you are referring to are the discharge nozzles associated with the valves, where the discharge nozzles are to be replaced. See 44 42 56.05/2.03/L for additional clarification.

48. Question: Drawing 43-E-201. Please clarify product and requirements for valves 714FV1 and FV2.

Response: See P&ID 08-N-611. These are the existing solenoid valves for the biofilter. This is existing equipment being relocated and re-wired; it's not new equipment.

49. Question: In reference to Section 31 15 00 Part 3.01 A. 3., can you provide detail and/or clarification on the 3-foot layer of drainage blanket?

Response: The 3 foot thick "drainage blanket" shall be #57 stone.

50. Question: Will UV Lifecycle cost forms be provided in an editable electronic format?

Response: The files will be provided as a supplement to this Addendum.

51. Question: Item D (Total Amount of Cash Allowances) shown on page 3 of 00 41 00 appears to be incorrect. Please clarify.

Response: See below for edit to Bid Form.

52. Question: At least one of the two companies (Kinder Morgan and Southern Company) that we've contacted regarding the gas line encroachment have said that they are waiting for a plan that shows how the existing gas lines will be supported during the installation of the new Plant Effluent line. Response #7 in Addendum 4 says that permits cannot be obtained until the Contract is awarded. Are there methods of excavation, shoring and/or support of the existing gas lines that are prohibited within the gas line easement? Can you provide additional information that will allow the Contractor to plan their

approach pre-bid thereby minimizing the risk that the approach won't be rejected post-bid?

Response: CH2M cannot make any representation on behalf of the gas companies as to acceptable means and methods. Nor can we guarantee any approach as the ultimate authority for each permit will be the individual gas companies. Contractors are to coordinate directly with the gas companies to become aware of guidelines and restrictions for work conducted in the easement. Please use the additional time provided to ensure that these contacts are made and work approaches are discussed with the damage prevention departments of each gas company.

B. **PART 1, PROCUREMENT REQUIREMENTS**

1. **Section 00 41 00, Bid Form**

Page 4, Item D. TOTAL AMOUNT OF CASH ALLOWANCES, DELETE \$322,000 and REPLACE with \$332,000.

Supplement 1.1 UV Lifecycle Cost – Trojan, DELETE and REPLACE with the attached.

Supplement 1.2 UV Lifecycle Cost – Wedeco, DELETE and REPLACE with the attached.

C. **PART 2, CONTRACTING REQUIREMENTS**

1. **Section 00 52 00 Agreement**

Page 2, Part 3.2.2, DELETE "...Contractor shall pay Owner One Thousand Dollars (\$1,500)..." and REPLACE with "...Contractor shall pay Owner One Thousand, Five Hundred Dollars (\$1,500)..."

2. **Section 00 73 00 Supplementary Conditions**

Page 23, SC-11.01.A.5, DELETE

Page 24, SC-12.03, Replace the numbers of Adverse weather days as follows:

January – 8 days
February – 7 days
March – 7 days
April – 7 days
May – 7 days
June – 7 days
July – 7 days

August - 6 days
 September – 6 days
 October – 6 days
 November 7 days
 December – 8 days

Page 24, SC-12.03, At the end of this section ADD the following:

“Adverse weather days shall be defined as any day in which there is precipitation in excess of 0.1 inch. An additional day beyond the precipitation event may be considered an adverse weather day if it is deemed by the RPR that the effect of precipitation on the project site condition precludes the Contractor from doing work. Such conditions may include mud or snow cover.”

Page 27, SC-14.02.A.1, last sentence, DELETE “O.C.G.A.13-10-20” and REPLACE with “O.C.G.A.13-10-2.”

D. PART 3, SPECIFICATIONS

1. Section 01 31 13, PROJECT COORDINATION

Page 1, 1.01.B, Add the following to the end of the section:

“5. If a bulkhead is used for bypassing operation, supply Drawings and calculations for the bulkhead design. Drawings and calculations must be signed and sealed by and Engineer registered in the State of Georgia.”

Page 6, 1.06.G.2.b, DELETE and REPLACE with the following:

“b. Bypass pumping capacity must be 54 mgd to handle potential peak flow condition.”

Page 6, 1.06.G.e, DELETE and REPLACE with the following:

“e. Bypassed flow may be discharged into existing W3 Pump Station wet well or flume approach channel. A bulkhead may be installed temporarily in the flume to separate the bypassed flow from the 60 inch effluent pipe.”

Page 6, 1.06.G, ADD the following at the end of this section:

“h. Bypass may be done from individual secondary clarifier effluent boxes. Contractor may use 3 to 4 clarifier effluent boxes.”

“i. Contractor must supply 1 duty and 1 standby pump for each effluent box used. Pumps must be on VFDs and level control must be supplied to maintain the level to within one foot.”

2. **Section 46 66 20, ULTRAVIOLET DISINFECTION EQUIPMENT**

Page 5, 1.04.H.b, DELETE

Page 8, 1.05.A.19, DELETE the following: "...conduit and grounding layout drawings,"

Page 16, 2.04.B.14.c, ADD ";19 AWG for 24V DC.

Page 17, 2.04.D.6, DELETE

Page 19, 2.05.B. DELETE "Type 316 Stainless Steel" and REPLACE with "Type 304 Stainless Steel."

E. **PART 4, DRAWINGS**

Drawing 05-Y-202, Grid B3, DELETE text "Two V-142, IE 853.70" and REPLACE with text "Two 4" V122, IE 853.70."

All Bidders shall acknowledge receipt and acceptance of this Addendum No. 6 in the Bid Form or by submitting the Addendum with the bid package. Bid Forms submitted without acknowledgment or without this Addendum will be considered in nonconformance.

CH2M HILL

Project Manager

Appended hereto and part of Addendum No. 6:

Section 00 41 00, Bid Form Supplement 1.1 – UV Lifecycle Cost – Trojan
Section 00 41 00, Bid Form Supplement 1.2 – UV Lifecycle Cost – Wedeco

END OF ADDENDUM

Supplement 1.1 - UV Disinfection Equipment Quotation and Lifecycle Cost Evaluation Form - TROJAN

Item	Units	Value	Notes
A. System Design Criteria and Configuration			
A.1	Design UV Dose	mJ/cm2	35
A.2	Total Number of Channels	#	1
A.3	Number of Banks per Channel	#	Vendor Entry
A.4	Total Number of Banks	#	Vendor Entry
A.5	Number of Modules per Bank	#	Vendor Entry
A.6	Total Number of Modules	#	Vendor Entry
B. Equipment			
B.1	Number of Lamps per Module	#	Vendor Entry
B.2	Total Number of Lamps	#	Vendor Entry
B.3	Power Consumption per lamp	Watts	Vendor Entry
B.4	No. of Ballasts	#	Vendor Entry
B.5	No. of Quartz Sleeves	#	Vendor Entry
B.6	No. of UV Intensity Sensors	#	Vendor Entry
B.7	No. Replaceable Cleaning Components	#	Vendor Entry
C. Equipment Operating at Average Condition (permitted MMADF of 6.6 mgd)			
C.1	No. of Lamps	#	Vendor Entry
C.2	No. of Ballasts	#	Vendor Entry
C.3	No. of Quartz Sleeves	#	Vendor Entry
C.4	No. of UV Intensity Sensors (UVIS)	#	Vendor Entry
C.5	No. of Replaceable Cleaning Components (RCC)	#	Vendor Entry
D. Parts Warranty			
D.1	Lamp Warranty	hours	Vendor Entry
D.2	Lamp Warranty	years	Divide value in D.1 by 8,760. Entry to be to the nearest hundreth.
D.3	Ballast Warranty	years	Vendor Entry
D.4	Quartz Sleeve Warranty	years	Vendor Entry
D.5	UVIS Warranty	years	Vendor Entry
D.6	RCC Warranty	years	Vendor Entry
E. Replacement Parts Pricing			
E.1	Lamp Cost	\$/unit	Vendor Entry
E.2	Ballast Cost	\$/unit	Vendor Entry
E.3	Quartz Sleeve Cost	\$/unit	Vendor Entry
E.4	UVIS Cost	\$/unit	Vendor Entry
E.5	RCC Cost per lamp	\$/unit	Vendor Entry
F. Estimated No. of Parts Replaced Annually			
F.1	Estimated Annual Lamp Replacement	#	Divide value in C.1 by value in D.2. Round up to the nearest whole number.
F.2	Estimated Annual Ballast Replacement	#	Divide value in C.2 by value in D.3. Round up to the nearest whole number.

Supplement 1.1 - UV Disinfection Equipment Quotation and Lifecycle Cost Evaluation Form - TROJAN

	Item	Units	Value	Notes
F.3	Estimated Annual Sleeve Replacement	#		Divide value in C.3 by value in D.4. Round up to the nearest whole number.
F.4	Estimated Annual UVIS Replacement	#		Divide value in C.4 by value in D.5. Round up to the nearest whole number.
F.5	Estimated Annual RCC Replacement	#		Divide value in C.5 by value in D.6. Round up to the nearest whole number.
E. Estimated Annual Part Replacement Cost				
G.1	Est. Annual Lamp Replacement Costs	\$		Multiply value in E.1 by value in F.1. Round up to the nearest dollar.
G.2	Est. Annual Ballast Replacement Costs	\$		Multiply value in E.2 by value in F.2. Round up to the nearest dollar.
G.3	Est. Annual Sleeve Replacement Costs	\$		Multiply value in E.3 by value in F.3. Round up to the nearest dollar.
G.4	Est. Annual UVIS Replacement Costs	\$		Multiply value in E.4 by value in F.4. Round up to the nearest dollar.
G.5	Est. Annual RCC Replacement Costs	\$		Multiply value in E.5 by value in F.5. Round up to the nearest dollar.
G.6	Total Est. Annual Replacement Costs	\$		
H. Estimated Labor Requirements				
H.1	Time to Replace Lamp	hours	0.5	
H.2	Time to Replace Ballast	hours	0.5	
H.3	Time to Replace Sleeve	hours	1	
H.4	Time to Replace UVIS	hours	2	
H.5	Time to Replace RCC	hours	1	
I. Estimated Annual Labor Costs				
I.1	Est. Labor Rate	\$/hour	\$50.00	
I.2	Est. Annual Labor Cost for Lamp Replacement	\$		Multiply value in F.1 by value in H.1 by Value in I.1.
I.3	Est. Annual Labor Cost for Ballast Replacement	\$		Multiply value in F.2 by value in H.2 by Value in I.1.
I.4	Est. Annual Labor Cost for Sleeve Replacement	\$		Multiply value in F.3 by value in H.3 by Value in I.1.
I.5	Est. Annual Labor Cost for UVIS Replacement	\$		Multiply value in F.4 by value in H.4 by Value in I.1.
I.6	Est. Annual Labor Cost for RCC Replacement	\$		Multiply value in F.5 by value in H.5 by Value in I.1.
I.7	Total Est. Annual Labor Cost	\$		Add values I.2 through I.6.
J. Estimated Annual Power Cost				
J.1	Power Draw at Peak Week Flow (8.3 mgd)	kW		Vendor Entry
J.2	Power Draw at Average Flow (6.6 mgd)	kW		Vendor Entry
J.3	Power Draw at Minimum Flow (1.8 mgd)	kW		Vendor Entry
J.4	Operating time at Peak Week Condition	%	5%	
J.5	Operating time at Average Condition	%	50.0%	
J.6	Operating time at Minimum Condition	%	45.0%	
J.7	Power Cost	\$/kWh	\$0.10	
J.8	Power Usage for Operating time at Peak Week Condition	kWh		Multiple value in J.1 by value in J.4 by 8,760.
J.9	Power Usage for Operating time at Average Condition	kWh		Multiple value in J.2 by value in J.5 by 8,760.
J.10	Power Usage for Operating time at Minimum Condition	kWh		Multiple value in J.3 by value in J.6 by 8,760.
J.11	Total Annual Power Usage	kWh		Add Values in J.8, J.9, and J.10.
J.12	Est. Annual Power Costs at ADF	\$		Multiply value in J.11 by J.7.

Supplement 1.1 - UV Disinfection Equipment Quotation and Lifecycle Cost Evaluation Form - TROJAN				
Item		Units	Value	Notes
K. Estimated Present Worth				
K.1	TOTAL EQUIPMENT COST	\$		Vendor Entry
K.2	Est. Total Annual Replacement Parts Cost	\$		Enter value in G.6.
K.3	Est. Total Annual Labor Cost	\$		Enter value in I.7.
K.4	Est. Total Annual Power Cost at ADF	\$		Enter value in J.12.
K.5	Est. Total Annual Operating Costs	\$		Add values in K.2 through K.4.
K.6	Present Value of Est. Annual Operating Costs	\$		Multiply value in K.5 by 12.46. Assumes (P/A, 5%, 20).
K.7	ESTIMATED PRESENT WORTH (20 years)	\$		Add values in K.1 and K.6.

Supplement 1.2 - UV Disinfection Equipment Quotation and Lifecycle Cost Evaluation Form - WEDECO

	Item	Units	Value	Notes
A. System Design Criteria and Configuration				
A.1	Design UV Dose	mJ/cm2	35	
A.2	Total Number of Channels	#	1	
A.3	Number of Banks per Channel	#		Vendor Entry
A.4	Total Number of Banks	#		Vendor Entry
A.5	Number of Modules per Bank	#		Vendor Entry
A.6	Total Number of Modules	#		Vendor Entry
B. Equipment				
B.1	Number of Lamps per Module	#		Vendor Entry
B.2	Total Number of Lamps	#		Vendor Entry
B.3	Power Consumption per lamp	Watts		Vendor Entry
B.4	No. of Ballasts	#		Vendor Entry
B.5	No. of Quartz Sleeves	#		Vendor Entry
B.6	No. of UV Intensity Sensors	#		Vendor Entry
B.7	No. Replaceable Cleaning Components	#		Vendor Entry
C. Equipment Operating at Average Condition (permitted MMADF of 6.6 mgd)				
C.1	No. of Lamps	#		Vendor Entry
C.2	No. of Ballasts	#		Vendor Entry
C.3	No. of Quartz Sleeves	#		Vendor Entry
C.4	No. of UV Intensity Sensors (UVIS)	#		Vendor Entry
C.5	No. of Replaceable Cleaning Components (RCC)	#		Vendor Entry
D. Parts Warranty				
D.1	Lamp Warranty	hours		Vendor Entry
D.2	Lamp Warranty	years		Divide value in D.1 by 8,760. Entry to be to the nearest hundreth.
D.3	Ballast Warranty	years		Vendor Entry
D.4	Quartz Sleeve Warranty	years		Vendor Entry
D.5	UVIS Warranty	years		Vendor Entry
D.6	RCC Warranty	years		Vendor Entry
E. Replacement Parts Pricing				
E.1	Lamp Cost	\$/unit		Vendor Entry
E.2	Ballast Cost	\$/unit		Vendor Entry
E.3	Quartz Sleeve Cost	\$/unit		Vendor Entry
E.4	UVIS Cost	\$/unit		Vendor Entry
E.5	RCC Cost per lamp	\$/unit		Vendor Entry
F. Estimated No. of Parts Replaced Annually				
F.1	Estimated Annual Lamp Replacement	#		Divide value in C.1 by value in D.2. Round up to the nearest whole number.
F.2	Estimated Annual Ballast Replacement	#		Divide value in C.2 by value in D.3. Round up to the nearest whole number.

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	Item	Units	Value	Notes
F.3	Estimated Annual Sleeve Replacement	#		Divide value in C.3 by value in D.4. Round up to the nearest whole number.
F.4	Estimated Annual UVIS Replacement	#		Divide value in C.4 by value in D.5. Round up to the nearest whole number.
F.5	Estimated Annual RCC Replacement	#		Divide value in C.5 by value in D.6. Round up to the nearest whole number.
E. Estimated Annual Part Replacement Cost				
G.1	Est. Annual Lamp Replacement Costs	\$		Multiply value in E.1 by value in F.1. Round up to the nearest dollar.
G.2	Est. Annual Ballast Replacement Costs	\$		Multiply value in E.2 by value in F.2. Round up to the nearest dollar.
G.3	Est. Annual Sleeve Replacement Costs	\$		Multiply value in E.3 by value in F.3. Round up to the nearest dollar.
G.4	Est. Annual UVIS Replacement Costs	\$		Multiply value in E.4 by value in F.4. Round up to the nearest dollar.
G.5	Est. Annual RCC Replacement Costs	\$		Multiply value in E.5 by value in F.5. Round up to the nearest dollar.
G.6	Total Est. Annual Replacement Costs	\$		
H. Estimated Labor Requirements				
H.1	Time to Replace Lamp	hours	0.5	
H.2	Time to Replace Ballast	hours	0.5	
H.3	Time to Replace Sleeve	hours	1	
H.4	Time to Replace UVIS	hours	2	
H.5	Time to Replace RCC	hours	1	
I. Estimated Annual Labor Costs				
I.1	Est. Labor Rate	\$/hour	\$50.00	
I.2	Est. Annual Labor Cost for Lamp Replacement	\$		Multiply value in F.1 by value in H.1 by Value in I.1.
I.3	Est. Annual Labor Cost for Ballast Replacement	\$		Multiply value in F.2 by value in H.2 by Value in I.1.
I.4	Est. Annual Labor Cost for Sleeve Replacement	\$		Multiply value in F.3 by value in H.3 by Value in I.1.
I.5	Est. Annual Labor Cost for UVIS Replacement	\$		Multiply value in F.4 by value in H.4 by Value in I.1.
I.6	Est. Annual Labor Cost for RCC Replacement	\$		Multiply value in F.5 by value in H.5 by Value in I.1.
I.7	Total Est. Annual Labor Cost	\$		Add values I.2 through I.6.
J. Estimated Annual Power Cost				
J.1	Power Draw at Peak Week Flow (8.3 mgd)	kW		Vendor Entry
J.2	Power Draw at Average Flow (6.6 mgd)	kW		Vendor Entry
J.3	Power Draw at Minimum Flow (1.8 mgd)	kW		Vendor Entry
J.4	Operating time at Peak Week Condition	%	5%	
J.5	Operating time at Average Condition	%	50.0%	
J.6	Operating time at Minimum Condition	%	45.0%	
J.7	Power Cost	\$/kWh	\$0.10	
J.8	Power Usage for Operating time at Peak Week Condition	kWh		Multiple value in J.1 by value in J.4 by 8,760.
J.9	Power Usage for Operating time at Average Condition	kWh		Multiple value in J.2 by value in J.5 by 8,760.
J.10	Power Usage for Operating time at Minimum Condition	kWh		Multiple value in J.3 by value in J.6 by 8,760.
J.11	Total Annual Power Usage	kWh		Add Values in J.8, J.9, and J.10.
J.12	Est. Annual Power Costs at ADF	\$		Multiply value in J.11 by J.7.

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Item		Units	Value	Notes
K. Estimated Present Worth				
K.1	TOTAL EQUIPMENT COST	\$		Vendor Entry
K.2	Est. Total Annual Replacement Parts Cost	\$		Enter value in G.6.
K.3	Est. Total Annual Labor Cost	\$		Enter value in I.7.
K.4	Est. Total Annual Power Cost at ADF	\$		Enter value in J.12.
K.5	Est. Total Annual Operating Costs	\$		Add values in K.2 through K.4.
K.6	Present Value of Est. Annual Operating Costs	\$		Multiply value in K.5 by 12.46. Assumes (P/A, 5%, 20).
K.7	ESTIMATED PRESENT WORTH (20 years)	\$		Add values in K.1 and K.6.