

Appendix B

De Nora Proposal

15 March, 2022

Charlie Ulloa, M.A.Sc., E.I.T.  
AECOM- Water Group, Canada  
99 Commerce Drive, Winnipeg, MB R3P 0Y7

Reference: Quotation QS-1601-34 Upgrades at Winnipeg Deacon WTP Rev 5  
De Nora UV Technologies project US-03056.WINN

Dear Mr. Ulloa:

We have revised our Revision 4 proposal of 19-April-2021 to address cost escalation over the past year and align the package with the drawings that were submitted, include components that were added (surge suppressors, ethernet switches, DC Drive boards, reactor top baffles), remove optional equipment (UVT analyzers, etc.) and remove the cost associated with the drawings completed separately.

This project consists of six (6) SENTINEL 48 - 9x20kW UV Reactors and has been in operation since delivery and commissioning in 2004.

The proposed scope of work is as follows:

1. Replace all sensor wells and UV duty sensors to accommodate current filtered water at 95% UVT vs original 75% design. Design flow remains 140 mld.
2. Upgrade wipers to 1.25" drive shaft with new wiper plates.
3. Replace the top reactor baffles to conform with the 2009 reactor validation.
3. Upgrade reactor control program to current standard with standard validation vs. custom originally used. Include provisions for Action Spectra Correction Factor (ASCF) in program
4. Upgrade PLC and OIT HW. The quoted PLC hardware is the Modicon M580 series PLC with Ethernet networking. Magelis color touch screens are included for the Operator Interface Terminals (OIT).

The SENTINEL power and control panels in both plants are understood to be in good condition considering the age. Ballasts, saturated cores, and capacitors in the lamp power section have been replaced as required over the service years. Our recommended upgrade path is:

- No substantial change to power section components (ballasts, saturated cores, capacitors).
- Upgrade PLC via a one-for-one swap in the control section with the new Schneider M580 series PLC. The other non-PLC components on the control subpanel would not be changed. The current control section has ample space, and this simplifies and reduces field time to change operating UV units over to the new PLC.
- We have provided estimates for De Nora Water Technologies field technicians to supervise and or check the installation and commissioning of the mechanical and electrical components quoted. Please note that these

are estimates only and assume support from Winnipeg Deacon plant staff and the contractor, and ready access to equipment.

- We have included Computational Fluid Dynamic Modeling (CFD) of the installed and validation piping to predict the impact of the installed piping on the validation performance. Originally an on-site validation was performed at the Deacon facility due to the non-conforming piping arrangement. This work will now be performed by Carollo Engineers as we no longer have the in-house capability.

Pricing by function is as follows:

### *Mechanical Updates to Qty. 6 UV Reactors*

Description	P/N	Qty
DRIVE SCREW, 1 1/4" ACME, 48" SN, PART DETAIL	S301746	18
DRIVE SCREW SLEEVE, PART DETAIL	S300445	18
UV SENSOR WINDOW, 13.78 INSERTION, ASSEMBLY DETAIL	S300736	18
UV SENSOR WINDOW, 7.35 INSERTION, ASSEMBLY DETAIL	S300737	36
UV SENSOR (0-1000 W/m2, 30 DEG) MODIFICATION PART DETAIL	S301640	54
WIPER PLATE ASSEMBLY, 48" STAGGERED CONFIG., w/o WIPERS	S301554	18
TOP BAFFLES	S301207	18

Notes:

1. Installation is by others, supervision priced separately.
2. Separate price below for FOB, Winnipeg, MB.
3. Quartz wipers are not included in the wiper plate assembly.
4. Disposal of removed components by others.

*Control Updates to Qty. 6 UV Control Cabinets*

PLC Upgrade - Modicon M580 series w/Magelis OIT.

Description	P/N	Qty
DISPLAY, MAGELIS, 12" COLOR, TFT, W/E-NET, 24VDC	45050158	6
DC DRIVE, 240/120VAC IN, 24/12VDC OUT, 5A	45049675	54
POWER DIST. BLOCK, 1 POLE, ENCLOSED, 600V	45050048	18
GND LUG, 2-C (#14-2/0), 1-HOLE MOUNT	45049824	6
E-NET SWITCH, 6TX-2FX PORT, 24VDC, ST CONNECT	#N/A	6
CABLE, PATCH, CAT5e, 3 FT	45049778	12
SURGE SUPPRESSOR TYPE 3 Plug & Base	#N/A	6
CABLE, PATCH, CAT5e, 10FT,	45049779	6
PROCESSOR MODULE, LEVEL 1, DISTRIBUTED	#N/A	6
POWER SUPPLY MODULE	#N/A	6
DIGITAL INPUT MODULE, 32-CH, ISOLATED	#N/A	12
DIGITAL OUTPUT MODULE, 16-CH, RELAY	#N/A	12
ANALOG INPUT MODULE, 8-CH, ISOLATED	#N/A	18
ANALOG OUTPUT MODULE, 4-CH, ISOLATED	#N/A	18
ETHERNET BACKPLANE, 12 SLOTS, (RACK X80)	#N/A	6
PREFORMED CORDSET, W/FLYING LEADS ON 1 END	#N/A	12
REMOVABLE CONNECTION BLOCK, 20-WAY	#N/A	30
REMOVABLE CONNECTION BLOCK, 28-WAY	#N/A	18
SPD, 40KA, 600VAC DELTA, 3 PH, 3 WIRE, NEMA 4X	#N/A	6
TB, FUSED, 24V DC, WBF1	45049331	12
FUSE, 2A, 250V, STYLE AGC	45049324	6
RELAY, SPDT, 6A, 24V COIL, LED, W/BASE	45049954	12
1A FUSE AGC STYLE	45049325	6

Notes:

1. Installation is by others, supervision estimated and priced separately.

2. Separate price below for FOB, Winnipeg, MB.
3. Disposal of removed PLC equipment by others.

### *PLC/OIT Programming and Engineering Services*

#### PLC PROGRAMMING AND ENGINEERING SERVICES

Description
1. Design, program and provide Schneider/Modicon PLC and HMI program for the site applications according to the reactor validation. This includes all updates to current De Nora Water Technologies standards with sensor calibration and calculation of the action spectrum correction factor (ASCF).
2. Subcontract Carollo Engineering to perform CFD Modeling of validation vs. installed piping configuration to show non-significant impact on performance.
3. Provide SCADA Interface Document minimizing changes to the extent possible.
4. Three days on site to assist in start-up and SCADA integration. The SCADA integration supplier must be present to assist in testing.
5. Update and supply revised Operations and Maintenance manual with modifications: <ul style="list-style-type: none"><li>- Dwg changes</li><li>- OIT/HMI screens</li><li>- SCADA ID</li></ul>
6. Project Management

Notes:

1. Schneider/Modicon development software is not included.
2. Three days of site assistance by software engineer included. Additional days can be provided at De Nora Water Technologies service rates.

### *Freight*

Description	Qty
Freight for components quoted - FOB Winnipeg, MB	1

3. Note: Assumes single dedicated load. Multiple shipments, if required, extra.



### Field Installation and Commissioning Services

#### Field Technical Services

Description	Qty. (Days)
Installation of Mechanical Modifications.	22
Installation of PLC Upgrade	8
Start-up/Commission System Upgrades	6.5

Note: Assumes field work done continuously with maximum 3 trips to the site. If work is broken up, each additional trip would incur 2.5 days travel time. Time on site can be reduced if work is done by others without supervision (after supervision on first one or two reactors).

If any additional field technician services are required, they are currently at a rate of \_\_\_\_\_ per day inclusive of travel and living expenses. Travel time is billed at daily rate.

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Any additional or different terms or conditions which may appear in any communication from \_\_\_\_\_, including, without limitation, in any printed form provided, are hereby expressly objected to and rejected in full and shall not be effective or binding in any capacity unless expressly accepted in an authorized writing by De Nora UV Technologies, LLC, regardless of, and fully notwithstanding, De Nora UV Technologies, LLC's supply of any goods and services or the execution of any document or acceptance by any person other than an officer or authorized agent of De Nora UV Technologies, LLC

In the event that this Proposal is executed by duly authorized representative and/or signatory then all terms and conditions of this Proposal, including but not limited to all matters pertaining to pricing and specification, commercial terms as included herein or incorporated by reference are deemed to be accepted. If purchaser issues a purchase order containing any other terms and conditions, such terms shall be of no effect unless expressly agreed to in writing by a duly authorized representative of De Nora UV Technologies, LLC.

Notwithstanding any other provision of these Terms or the Seller's Documentation, unless otherwise expressly stated in the Seller's Documentation, if, at any time during the course of Seller's performance of the sale of the Products or Services, there is an unforeseen and material increase in the price of raw materials, materials, labor, or other costs of Seller associated with the Products or Services, Seller shall have the right to reasonably adjust the prices set forth in the Seller's Documentation upon written notice to the Purchaser setting forth the amount of such price adjustment and reasonably setting forth the cost changes associated therewith.

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Charlie Ulloa  
15 March, 2022



If you should have any questions, please contact me by email or at the number listed below. We look forward to working with you and the City on these important upgrades to the Sentinel™ system.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Keith Bircher'.

**Keith Bircher**

Global Product Manager UV

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**De Nora UV Technologies, LLC**