

ADDENDUM NO. 1
November 7, 2024

PROJECT: FORT GRIFFIN SUD
WATER TREATMENT PLANT IMPROVEMENTS

BID DATE: DECEMBER 3, 2024 AT 1:30 PM

The following changes and/or additions shall be made to the Plans, Specifications, and Contract Documents for the above referenced project. Bidder shall acknowledge receipt of this Addendum by signing below and returning this Addendum with the Bid.

- 1) The attached document shall be included as Appendix A as referred to in Specification Item 11 04 02.

Bidder's Acknowledgment

Date

Prepared by:

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TBPE Firm No. 2448

EXHIBIT A: MICROFILTER AND REVERSE OSMOSIS CRITERIA

The microfilter and reverse osmosis equipment supply shall be by one vendor and shall meet the following criteria in addition to those stated in any other sections of the Plans and Specifications.

1. Delivery Schedule

Milestone	Requested Schedule
First Submittal	8 Weeks from Notice to Proceed
Release to Manufacture	2 Weeks after First Submittal Approval
Equipment & Preliminary O&M Manual Ready to Ship	18 Weeks after Release to Manufacture
Installation Complete	6 Weeks after Equipment Delivery
Commissioning Complete	6 Weeks after Installation Complete
Performance Test Complete	2 Weeks after Commissioning Complete
Final Acceptance	2 Weeks after Performance Test

2. Scope of Supply

Item Description	
Membrane Equipment Control System	
MF Unit	
MF Feed Tank (On Skid)	
MF Feed Pump & VFD (on-skid)	
MF Feed Strainer (on-skid)	
MF RF Tank (on-skid)	
MF RF Pump (on-skid)	
Block & Bleed Valves	
RO Unit	
RO Equipment Control System	
RO Reducing Agent Dosing Equipment	
RO pH Adjustment Dosing Equipment	
RO Antiscalant Dosing Equipment	
RO Low Pressure Feed Pumps	
RO High Pressure Feed Pumps (on-skid)	
RO Cartridge Filter System on-skid)	
MF Membrane Equipment CIP System	
RO Membrane Equipment CIP System	
Compressed Air Equipment	

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3. Equipment Description of Major Components

One Control Panel (CP) to Include:

Enclosure	Skid Mount NEMA 4 Painted Carbon Steel
PLC	One Allen Bradley Controllogix Series
PLC Software	Allen Bradley Logix 5000
PLC Programming Format	Ladder Logic
Operator Interface Terminal	Allen Bradley VersaView Industrial PC
HMI Software	Factory Talk
On-Machine I/O	Festo or Numatics, Remote I/O
I/O for Off-Skid Devices that will be hardwired back to CP	Festo or Numatics, Remote I/O
LAN	Ethernet Communications with Ports for Communication with Supplied PC, Plant SCADA, VFD's, and Remote I/O
Remote Connectivity	Through Web Server
UPS	30 Minute Power Supply for PLC

System Startup After Power Failure:

In the event of a power failure, the PLC will pause the system and temporarily disable all alarms and wait for power restoration. Once power is restored, 60 seconds later the PLC will enable all alarms and resume the system where it left off given there are no critical alarms. If the power interruption is longer than the max time of the UPS, then the system will not automatically restart and will require the operator to check for alarms and place components back into auto control before starting the system.

Integration:

MF Units:

Quantity	1
Type	Packaged
Size	0.147 MG
Piping Material	PVC/HDPE
Module Spaces	16 per Unit
Installed Modules	5 per Unit
Module Part Number	UNA-620A
Membrane Area Per Module	538 sq. ft.
Membrane Operation Limits	0 - 40° C 0 - 43.5 psi
Customer Connections	ANSI Class B 150 lb Flanges

Feed Tank:

Quantity	1 (on-skid)
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Type	Square HDPE
Size	390 Gallons
<u>Feed Pump:</u>	
Quantity	1 (on-skid)
Type	Close Coupled Centrifugal
Size	500 gpm at 105 ft TDH
Motor	20 HP, 3500 RPM Voltage, 277/480 V
Communication Protocol	Ethernet
Signals Used	Discrete signals: Run Command, Run Feedback, Fault Status. Analog Signals: Speed Reference
Operational Limits	0 - 40° C 0 - 100 psi
Manufacturer/Model	Goulds SSH 316 SST
VFD Driven	Yes
VFD Manufacturer	Danfoss
VFD Location	On-Skid
VFD Enclosure Type	NEMA 4X

The feed flow will be divided equally between the filter racks on-line using the VFD on its own dedicated feed pump. The feed pump is also to be used for circulating chemicals during a chemical clean.

<u>Feed Strainer:</u>	
Quantity	1 (on-skid)
Type	Automatic Backwashing Basket
Size	500 Usqpm
Motor	1/4 HP
Communication Protocol	Hardwired
Signals Used	Discrete signals: Motor Forward and Reverse Feedback, limit switch 1 & 2 status, motor fault status, motor forward & reverse run command.
Operational Limits	0 - 40° C 0 - 100 psi
Manufacturer	Amiad

The feed strainer shall be a self cleaning type that requires a backwash at regular intervals to avoid clogging. The backwash timing shall be governed by setpoint interval, high pressure Differential Pressure Trigger, or manual initiation.

<u>Reverse Filtration Tank:</u>	
Quantity	1 (on-skid)
Type	Square HDPE
Size	550 Gallons

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<u>RF Pump</u>	
Quantity	1 (on-skid)
Type	Close Coupled Centrifugal
Size	625 gpm at 70 ft TDH
Motor	20 HP, 3500 RPM Voltage, 277/480 V
Communication Protocol	Ethernet
Signals Used	Discrete signals: Run Command, Run Feedback, Fault Status. Analog Signals: Speed Reference
Manufacturer/Model	Goulds SSH 316 SST
VFD Driven	Yes
VFD Manufacturer	Danfoss
VFD Location	On-Skid
VFD Enclosure Type	NEMA 4X
<u>Instrumentation:</u>	
Feed Turbidity Meter	Hach TU5300 Turbidimeter or equal
Filtrate Turbidity Meter	Hach TU5300 Turbidimeter or equal
Pressure Transmitters	Rosemount 2088 or equal
Flow Transmitters	Rosemount 8711 or equal
Temperature Transmitters	Rosemount 68 or equal
Pressure Gauges	Ashcroft 63 or equal
Pressure Switches	Barksdale CD2H or equal
<u>Valves:</u>	
Automatic Valves	Butterfly - Bray 31 or equal Solenoid - Festo or equal
Manual Valves	Butterfly - Bray 31 or equal Ball - Spears 3629 (> 1/2") or equal Ball - Spear 1529 (< 1/2") or equal Globe - Truelin N-651 or equal Water Check - Spear 542G or equal Air Check - Apollo #62 or equal
<u>Hot Water Transfer System:</u>	
Tank	1
	Type Cylindrical HDPE
	Size 1100 Gal
Heater	1
	Type Immersion
	Material 304L SS
	Manufacturer Watlow or equal
	Communication Protocol Inputs: Heater Fault, Heater Run Status,
Pump	1
	Type Horizontal End Suction Centrifugal
	Size 45 GPM at 70 ft TDH

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VFD	Yes
Manufacturer	Gould or equal
<u>Strainer:</u>	
Quantity	1
Type	Cartridge
Filter Rating	5 Micron
Manufacturer	Pall or equal
<u>High Pressure Pump:</u>	
Quantity	1
Type	Vertical Multi-Stage Centrifugal
Size	118 gpm @ 590 ft TDH
Motor	30 HP, 277/480V/3 PH/60 HZ/3500 RPM
VFD	Yes
Manufacturer	Goulds or equal
<u>Pressure Vessels:</u>	
Quantity	1
Type	FRP
Size	8" Diameter by 6M
Manufacturer	Protec or equal
<u>Reverse Osmosis Elements:</u>	
Quantity	18
Type	Spiral Wound Thin Film Composite
Size	8" Diameter by 40" Long
Model	BW30XFRLE-400/34i or equal
Manufacturer	Filmtec or equal
<u>RO Control System:</u>	
PLC	Allen Bradley MicroLogix or equal
Operator Interface Terminal Communication	Allen Bradley PanelView 800-7 or equal Ethernet
<u>RO Clean-in-Place System Tank:</u>	
Quantity	1
Type	Cylindrical HDPE
Size	700 Gal
<u>Chemical Dosing System:</u>	
Quantity	3
Type	Metering
Manufacturer	Jesco or equal
Capacity	Max 2.3 gph @ max 105 psi, adjustable 20 to 100%
<u>RO Permeate System Pump:</u>	
Quantity	1

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Type	Horizontal End Suction Centrifugal
Size	125 gpm at 160 ft TDH
Motor	15 HP, 277/480V/3 PH/60 HZ/3500 RPM
Manufacturer	Goulds or equal
Communication Protocol	Hardwired
Signals Used	Inputs: Pump Running, Fault Outputs: Pump Run Command

Instrumentation:

Conductivity Meter	GF Signet or equal
pH/ORP Meter	GF Signet or equal
Flow Transmitters	GF Signet or equal
Pressure Gauges	Ashcroft 63 or equal
Pressure Switches	Barksdale CD2H or equal

Valves:

Automatic Valves	Butterfly - Bray 31 or equal Solenoid - Festo or equal
Manual Valves	Butterfly - Bray 31 or equal Ball - Spears 3629 (> 1/2") or equal Ball - Spear 1529 (< 1/2") or equal Globe - Truelin N-651 or equal Water Check - Spear 542G or equal Air Check - Apollo #62 or equal

4. Submittal Requirements

First Submittal	1 P&ID 2 General Arrangement Drawings 3 Electrical Interconnection Drawing (Power One-Line and Wiring Inter-connection list) 4 Electrical Drawings for Panels 5 Mechanical Replacement Parts List 6 Electrical Replacements Parts List 7 Compressed Air System Information 8 Installation Manual 9 Cutsheets for Vendor Supplies, Off-Skid Components
Second Submittal	10 Installation and Startup Checklist 11 Operation & Maintenance Manual 12 System Function Description Including Valve Sequencing Tables

5. Services and Labor

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Commissioning:

The supplier shall include on-site services of a Field Service Engineer as necessary to completely commission the system and insure error/alarm free operation of the entire system including troubleshooting, startup, and acceptance testing.

Operator Training:

The supplier shall provide on-site training by a Field Service Engineer for 3 days on site in one trip. Each day shall be considered 8 hours on site.

6. Water Quality Data

MF Feed Water Characteristics:

Caesium, Total (CA ⁺²)	ppm as CaCO ₃	192
Hardness, Total	ppm as CaCO ₃	300
Iron (Fe)	mg/l	.015 - .72
Manganese, Total (Mn ⁺²)	mg/l	.288 - .563
Manganese, Dissolved	mg/l	.288 - .563
Organic Carbon, Total (TOC)	mg/l	4.44 -6.02
pH		8.1
Temperature	°C	4 -27
Total Suspended Solids	mg/l	3.5 - 16
Turbidity	NTU	7.0 - 32

RO Feed Water Characteristics:

Aluminum, Total (Al ⁺³)	ppm	0.539
Barium (Ba ⁺²)	ppm	0.155
Caesium, Total (CA ⁺²)	ppm as CaCO ₃	192
Chloride (Cl ⁻¹)	ppm	414
Conductance, Specific	μ	2,900
Copper, Total (Cu ⁺²)	ppm	0.0817
Fats, Oils, Grease (FOG)	ppm	0
Hardness, Total	ppm as	300
Hydrocarbons	ppm	0
Iron (Fe)	ppm	.015 - .72
Magnesium, Total (Mg)	ppm	38.83
Manganese, Total (Mn ⁺²)	ppm	0.6
Nitrate (NO ₃)	ppm	0.87
Organic Carbon, Total (TOC)	ppm	6.02
pH		8.1
Silica, Total (SiO ₂)	ppm	9.54

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Sodium (Na ⁺¹)	ppm	125.48
Strontium (Sr ⁺²)	ppm	1.73
Sulfate (SO ₄ ⁻²)	ppm	315.4
Temperature	°C	4 -27

7. Treated Water Objectives

New Product Water 0.1 MGD
Total Dissolved Solids < 1,000 mg/l

MF System Operational Parameters at Design Flow:

Net Filtrate Capacity 0.122 MGD
Recovery 97 %
Instantaneous Flux 53 GFD
FM (Backwash Interval) 600 Gal of filtrated produced per module
EFM Interval 1 Day
CIP Interval 30 Days

RO System Operational Parameters at Design Flow:

Net Filtrate Capacity 0.05 MGD
Recovery 70 %
Instantaneous Flux 7 GFD
FM (Backwash Interval) 7.0 Gal of filtrated produced per module
CIP Interval 90 Days

8. Warranty Requirements

General Warranty:

All equipment and labor shall include a 12 month warranty from the date of startup. Startup shall be considered achieved when the goods provided by supplier have been demonstrated to be operational and functioning properly and accepted by all parties.

Module Warranty:

The membrane modules shall include a warranty of 100% replacement for the first 12 months after Startup and prorated for nine years thereafter. This warranty shall be valid assuming the membranes are properly maintained and operated during the warranty period. The prorated Replacement Module Price = (Seller's Current Module Pirce) x (number of months from Startup/number of months in the Module Warranty Period).