CITY OF BULLHEAD CITY, ARIZONA
UTILITIES DEPARTMENT

SECTION 10 WRP
BLOWER BUILDINGS IMPROVEMENTS

PROJECT NO. 27-U-001

ADDENDUM NO. 1

July 17, 2026

27-U-001

SECTION 10 WRP
BLOWER BUILDINGS IMPROVEMENTS

Addendum No. 1

The attention of the bidders is called to the following changes and clarifications to the original contract specifications, and they shall be taken into account in preparing proposals and shall be part of the Bid/Contract Documents.

The following changes and clarifications are to be made and become part of the Bid/Contract Documents. The changes and clarifications are as follows:

1. **The Bid Opening Date has been extended to August 12, 2026, at 3:00 PM Arizona Time**.

2. **Questions regarding the project must be submitted by 2:00 PM on July 22, 2026**.

3. **Included with this addendum are photos of the existing blower building for reference.**

   Photo of South Side of Building

   Photo of West Side of Building

   Photo of East Side of Building

   Photo of North Side of Building

   Photo of Existing Turbo Blowers (nine photos)

   Photo of Plenum Room

   Photo of Inside South and West Walls

4. **Modifications to the technical specifications (Volume 2):**

   Section 07 21 00 – Building Insulation

   2.07 ACCESSORIES:

   Add: F. Furring Z-Channel for Walls: Flanges: ¾” and 1-1/4”; depth as needed to accommodate insulation thickness; material: 25ga, Grade 33 ksi minimum yield strength; conforming with requirements of AISI S220-20, AISI S240-20, and ASTM A1003.

Add: 3.14 Z-CHANNEL INSTALLATION:
A. Install furring Z-Channels according to manufacturer's recommendations.

Section 40 02 05 – Piping Schedule
Piping Schedule:
Add: F. Buried PA (welded steel) will be sized 6" to 14".

Section 40 60 10.01 – PICS: Loop Descriptions
Replace the section in its entirety with the attached version dated July 14, 2026.

Section 43 05 50 – Installation of Turbo Blowers
2.01 CONTRACTOR FURNISHED ACCESSORIES:
Add: B. Contractor shall coordinate with Aerzen for the modification of the blower enclosures to accommodate a flanged connection for piping enclosure cooling air to the outside.

Section 43 11 20 – Air Foil Bearing Turbo Blowers
2.03 APPURTENANCES AND ACCESSORIES:
Add: C. In addition to the scope in the appendix, the unit shall be equipped with a flanged connection for venting blower enclosure cooling air to the outside.

Section 43 11 33 – Rotary Lobe Blowers
2.02.A:
Add: Model D 76 S DN 200, and Model D 52 S DN 150.

2.06 BLOWER ACCESSORIES:
Add: L. In addition to the scope in the appendix, the unit shall be equipped with a flanged connection for venting blower enclosure cooling air to the outside.

5. **Volume 3 is replaced in its entirety by the attached revised Volume 3 dated July 2026.**

-end-

This addendum must be signed, and a copy included in the bid proposal for the proposal to be valid.

Acknowledgement: _____ _____
Signature Date

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

A. This section includes the loop descriptions for the Process Instrumentation and Control System.

1.02 SUBMITTALS

A. Provide submittals in accordance with requirements in Section 40 60 10, PROCESS INSTRUMENTATION AND CONTROL SYSTEM – GENERAL.

1.03 RELATED SECTIONS

A. Section 40 60 10, PROCESS INSTRUMENTATION AND CONTROL SYSTEM (PICS): GENERAL.

B. Section 40 60 10.02, PICS: EQUIPMENT.

C. All electrical work executed under this section shall meet the requirements of Division 26 – ELECTRICAL.

D. Section 46 05 50, 46 05 50, INSTALLATION OF OWNER FURNISHED SCREENING SYSTEM.

1.04 AERATION BASIN REMOTE TERMINAL UNITS, RTU-AB1/3, RTU-DB

A. Only loop descriptions for control functions provided by plant SCADA, RTU-AB1/3, and RTU-DB are included here. Communication and control functions for Aeration Basin 2 are handled by RTU-AB2 supplied as part of the Aeration Basin 2 project. RTU-AB1/3 size and programming must consider monitoring and controlof all aeration basin blowers, two aeration basins, and up to three clarifiers.

1.05 LOOP DESCRIPTIONS FORMAT

A. The loop descriptions specify the functional performance of the loops and include a description of the functions of interlocks and control schemes.

B. PICS Contractor shall provide RTU-AB1/3 and RTU-DB, relay logic, software and hardware as necessary to implement the required functions.

C. The major components to be provided for each loop are listed in a table for each loop. Expanded information for these components, as well as panel schedule and calibration information are listed in Section 40 60 10.02, PICS: EQUIPMENT.

D. Tag Numbers:

1. Complete tag numbers used for SCADA programming will be provided by the Owner. Where numbers are provided, they differentiate between different aeration basins. Multiple units are indicated by number of units in parenthesis.
2. In this specification section and on the Process Instrumentation Diagram Drawings, ISA element designations are used to identify elements.

1.06 AERATION BASIN: AERATION CONTROL LOOP (RTU-AB1/3)

A. Equipment and Instrumentation:

1. Black text indicates equipment and instrumentation to be supplied by the PICS contractor as part of the Blower Buildings project.
2. Grey text indicates equipment and instrumentation that is existing, supplied by a manufacturer, supplied by Division 16, or will be supplied under a separate project. Known projects are listed.

TAG NUMBER	DESCRIPTION
LCP-AB1 LCP-AB3	AB 1 Local Control Panel (AB1 Rehab project) AB 2 Local Control Panel
BIP-AB1 (future) BIP-AB3 (future)	AB1 bioreactor instrument panel (AB1 Rehab project) AB1 bioreactor instrument panel
B-1 (3) B-1 (1) (future)	Aeration basin blowers Aeration basin blower
FE/FIT-1 FE/FIT-2 FE/FIT-3 (future)	AB1 thermal mass air flow meter AB2 thermal mass air flow meter AB3 thermal mass air flow meter
PI (3) (future) PI (1) (future)	Blower discharge pressure gauges Blower discharge pressure gauge
FCV-OX1 (3) (future) FCV-OX3 (3) (future)	AB1 air control valves to each aerated zone (AB1 Rehab project) AB3 air control valves to each aerated zone
FE/FIT-OX1 (3) (future) FE/FIT-OX3 (3) (future)	AB1 thermal mass air flow meter to each aerated zone AB3 thermal mass air flow meter to each aerated zone
AIT-AB1 (future) AIT-AB3 (future)	AB1 instrument controller (AB1 Rehab project) AB3 instrument controller
AE-OX1 (4) (future) AE-OX3 (4) (future)	AB1 DO probe in each aerated zone (AB1 Rehab project) AB3 DO probe in each aerated zone

B. Aeration System Summary: Each aeration basin train will be controlled as follows:

1. Dedicated header piping will convey the air to the three aerated zones. The header piping will be equipped with actuated butterfly valves to control air flow to each zone.

2. Instrumentation will consist of one dissolved oxygen (DO) meter in each of the three aerated zones, air flow meters on each dedicated header pipe, and the discharge pressure gauges associated with the blowers. DO measurement and feedback from the air flow meters will be used to control the blower VFDs and the header pipe valves to achieve the desired oxygen concentrations in the aerated zones.

C. Aeration Control Narrative:

1. Air flow control will be based on DO levels in the aerated zones. Each zone will have an operator adjustable DO set point. Depending on influent flow and load, for any given setpoint there is a corresponding air flow that should be delivered to the respective cell to achieve the desired dissolved oxygen concentration. The DO probes will report DO levels from each aerobic cell to plant SCADA, which will compare the measured levels to the desired set points. Based on the discrepancy between the set points and the measured levels, if any, a new desired air flow will be determined by plant SCADA for the individual cells. Desired air flow for the individual zones will be summed to determine the total air flow for all aerated zones in all the treatment trains in operation. Plant SCADA will select the number of blowers and ramp the blower VFDs up or down to deliver the desired air flow to the bioreactors. Feedback from the air flow meter in the blower discharge piping will be used to fine-tune VFD settings to achieve the desired air flow. Communication for blower speed will be communicated by RTU-AB1/3.
2. Plant SCADA receives air flow signals from the drop leg air flow meters, compares the desired air flow for each cell to the actual flow, and adjusts the air flow control valves for each cell accordingly. For example, if the desired flow is lower than the measured flow, air flow control valves will be closed incrementally until the measured air flow matches the desired air flow. Blower air flow will be adjusted to match. A small delay between blower speed adjustment and valve adjustment will minimize over and under compensation at the air flow control valves.
3. Automatic control for each aeration valve shall be as follows:
   The operator will enter the desired DO set point. Based on the deviation of the measured DO level in the aerobic cell from the set point, plant SCADA will change the desired air flow rate for that cell. The change in the desired air flow rate shall be determined during commissioning. However, the system integrator shall allow for a minimum of 6 DO ranges (i.e. dead bands). Plant SCADA shall maintain that flow rate for a certain period of time as determined by the aerobic cell “response time” before another adjustment to the flow rate is made based on the DO reading. The ”response time”,

together with DO dead band and flow increment (positive or negative) value will be determined during commissioning and will be adjustable by the operator. Also, there will be a single PID loop for each aerobic cell and the associated air flow control valve to determine the desired air flow.

4. The following lists DO set points for each aerated zone and corresponding air flows. These air flows are starting points to be used for system startup and if a train is brought back into service after shutdown for major maintenance. After startup, these air flows will be automatically adjusted based on the control strategy described above.

   a. Zone OX2-1: 1.8 mg/L, 1,600 scfm
   b. Zone OX2-2: 1.3 mg/L, 700 scfm
   c. Zone OX2-3: 0.8 mg/L, 400 scfm

D. Plant SCADA Monitoring and Control Functions: Plant SCADA shall have but not be limited to the below-listed functions for control of aeration. Additional monitoring may be provided and desired items selected by plant staff:

1. DO set point for each aerobic zone (operator adjustable)
2. Desired air flow rate calculation (PID loop) with operator adjustable deadbands, response time, and flow adjustment increment.
3. Measured DO value for each DO probe.
4. FAIL for each probe
5. Measured air flow rate for each aerobic zone (for all aeration basins in service)
6. Calculated total air flow for each aeration basin (sum of individual cells)
7. Calculated or measured total system air flow (sum of airflow for all aeration basins in service)
8. Measured air flow rate for each aeration basin as measured by thermal mass air flow meters to be located in the new Blower Building.
9. Air flow control valve position indication (each unit)
10. Air flow control valve position control command (each unit)
11. Air flow control valve actuator general FAIL (each unit)
12. Air flow control valve loss of air FAIL (each unit)
13. Air flow control valve actuator communication FAIL (each unit)
14. Blower Start/Stop/Speed (each unit)
15. Blower RUN (each unit)
16. Blower FAIL (general fault) (each unit)
17. Blower discharge temperature indication
18. Blower HIGH motor temperature (each unit)

19. Blower filter differential pressure (each unit)

1.07 AERATION BASIN: MIXER CONTROL LOOP (RTU-AB1/3)

A. Equipment and Instrumentation:

1. Grey text indicates equipment and instrumentation that will be supplied by a manufacturer and/or under a separate project. Known projects are listed.

TAG NUMBER	DESCRIPTION
M-SX1 (4) (future) M-SX3 (4) (future)	AB1 mixers (AB1 Rehab project) AB3 mixers

B. Mixer Control Narrative: The mixers will run continuously at constant speed and are only turned off if they require service or if the aeration basin is taken out of service. The mixers will be powered from the manufacturer-provided Aeration Basin 1 or 3 Local Control Panels, LCP-AB2 or LCP-AB3, and have local disconnects installed on the aeration basin.

C. Plant SCADA Monitoring and Control Functions: Plant SCADA will not control the mixers but will display status signals and allow for alarm acknowledgement. At a minimum, the following signals shall be displayed:

1. Mixer elapsed time (each unit)
2. Mixer RUN indication (each unit)
3. Mixer Communication FAIL (each unit)
4. Mixer FAIL indication (each unit)

a. Seal FAIL
b. High temp FAIL
c. High Amp draw indication (each unit)

D. Manufacturer Local Control Panel Functions: The manufacturer panels will contain the motor starters and will keep the mixers running continuously unless manually shut off. The panels shall send the above signals to RTU-AB1/3 via Ethernet communication protocol.

1.08 AERATION BASIN: MLR PUMP CONTROL LOOP (RTU-AB1/3)

A. Equipment and Instrumentation:

TAG NUMBER	DESCRIPTION
LOS-SX1 (3) (future) LOS-SX3 (3) (future)	AB1 MLR pumps local operator stations (AB1 Rehab project) AB3 MLR pumps local operator stations

P-SX1 (3) (future) P-SX3 (3) (future)	AB1 MLR pumps (AB1 Rehab project) AB3 MLR pumps

B. MLR Pump Control Narrative: The mixed liquor recycle (MLR) pump rates will be flow-paced based on influent flow. The pumps will be powered by variable frequency drives located in the manufacturer-provided Aeration Basin 1 or 3 Local Control Panels, LCP-AB1 or LCP-AB3. Control will be provided by the same panels, which will flow-pace the pumps based on a 15-minute average of influent flow and an operator adjustable recycle ratio. Recycle rates will vary between 200 and 400 percent of influent flow, up to a maximum of 400 percent of the full build-out design maximum month flow of 8.5 mgd. The recycle ratio will be operator-entered in the following increments: 2.0, 2.5, 3.0, 3.5, 4.0.

Local operator stations for the MLR pumps will be provided near the pumps.

C. Plant SCADA Control Functions: Plant SCADA will not control the MLR pumps but will display status signals and allow for alarm acknowledgement. At a minimum, the following signals shall be displayed:

1. MLR Pump elapsed time (each unit)
2. LOS HOA switch position indication (each unit)
3. MLR Pump RUN indication (each unit)
4. MLR Pump speed indication (each unit)
5. MLR Pump Communication FAIL (each unit)
6. MLR Pump FAIL indication (each unit)

    a. Seal FAIL
    b. High temp FAIL
    c. High Amp draw indication (each unit)

7. Plant SCADA shall send an influent flow signal to LCP-AB1 and LCP-AB3.

D. Manufacturer Local Control Panel Functions: The manufacturer panel will contain the VFDs and will control the pumps as described above. The panel shall flow pace the pumps as described in the Control Narrative above. The panel shall send the above signals to the plant SCADA system.

E. LOS Function and Controls: The LOSs shall communicate directly with the Aeration Basin LCPs. LOSs shall have the following functions:

1. HOA switch
2. RUN indication light (green)
3. FAIL indication light (red)
4. Alarm RESET button

F. Sequence of Operation:

1. HAND Operation

a. When the HOA switch at the LOS is in the HAND position, the pump runs continuously at the speed adjusted with the VFD speed potentiometer until the switch is turned to OFF, a fault occurs, or power to the pump is lost. If power to the MLR pumps is lost, LCP-AB1 or 3 may coordinate a staggered restart when power is restored. However, with an HOA switch set to HAND, LCP-AB1 or 3 does not control the pumps and all duty units will start as soon as power is restored.

2. Automatic Operation

a. During normal operation, the LOS HOA switch will be in the AUTO position and LCP-AB1 or 3 will control the pumps and VFD speed. Therefore, the MLR pump HOA switches should always be left in the AUTO position. The MLR pumps will run continuously until the selector switch is turned to OFF, a fault occurs, or power is lost. When power is restored, the pumps will automatically start with the HOAs in the AUTO position. If an MLR pump is turned to OFF at the LOS, LCP-AB1 or 3 does not control the pump and the pump will not run until turned to AUTO at the LOS.

3. FAIL Signals

a. Thermal switches are provided for each MLR pump motor. Excessive motor temperature will trip the thermal switches, which will stop the mixer motor. This alarm will clear when the motor cools; however, the pumps will need to be manually reset at the LOS before they can be restarted.

b. A moisture FAIL (seal leak) alarm will display on CP-AB1 or 3 if the moisture relays in the pump enclosure are tripped. This alarm does not shut down the equipment.

1.09 CLARIFIER CONTROL LOOP (RTU-AB1/3)

A. Equipment and Instrumentation:

1. Grey text indicates equipment that is existing, supplied by Division 16, or future.

TAG NUMBER	DESCRIPTION
MCC-F / MSB-AB	Existing motor control center to be replaced with new main switch board
LCP-CLR2	Clarifier 2 feed and local controls (existing)
LCP-CLR3	Clarifier 3 local control panel (existing)
LCP-CLR4 (future)	Clarifier 4 local control panel

B. Note that this project will replace MCC-F with a new Main Switch Board (MSB-AB) in the new Aeration Basin Blower Building.

C. Clarifier Control Narrative: The clarifiers will operate continuously. If the clarifier drive experiences high torque, it will shut down and send a FAIL signal to SCADA.

D. Plant SCADA Control Functions: Plant SCADA does not control the clarifiers as they operate continuously. At a minimum, the following signals shall be displayed on the SCADA screen:

1. Clarifier RUN (each unit)
2. Clarifier FAIL (general fault, each unit)
3. Alarm Silence (each unit)
4. LCP-CLR2,3,4 communication fault

E. Manufacturer Local Control Panel, LCP-CLR2,3,4 Control Functions: The manufacturer panel will contain the motor starter and will provide some control and monitoring functions including the following:

1. HOA switch
2. RUN indication
3. FAIL indication
4. RESET button
5. Motor overload indication
6. Drive cutout indication
7. HIGH Torque alarm
8. Alarm silence button

1.10 DIGESTERS: AERATION CONTROL LOOP (RTU-DB)

A. Equipment and Instrumentation:

1. Black text indicates equipment and instrumentation to be supplied by the PICS contractor as part of the Blower Buildings project.
2. Grey text indicates equipment and instrumentation that is supplied by a manufacturer or will be supplied under a future project.

TAG NUMBER	DESCRIPTION
B-2 (3) B-2 (2) (future)	Blowers Blowers
LCP-B-2 (3) LCP-B-2 (2) (future)	Blower integral Local Control Panel Blower integral Local Control Panel
FE/FIT (2) FE/FIT (2) (future)	Thermal mass air flow meters for Digesters 1 and 2 Thermal mass air flow meters for Digesters 3 and 4
PI (3) (future) PI (2) (future)	Blower discharge pressure gauges Blower discharge pressure gauge

B. Digester Aeration System Summary:

1. Dedicated blowers and header piping will supply air to each digester.
2. Manual valving will allow for manual blower alternation.
3. Instrumentation will consist of one thermal mass air flow meter and one pressure gauge in each dedicated discharge pipe .

C. Aeration Control Narrative:

1. Blowers will be called to run by the SCADA system. Blowers will run continuously unless air on-off cycles are set in SCADA.
2. Blower speed will be set manually by operators.
3. The local control panel integral to each blower will monitor signals and communicate with SCADA through Ethernet protocol.

D. Plant SCADA Control Functions: Plant SCADA will call the blowers to RUN and will display status signals and allow for alarm acknowledgement. At a minimum, the following signals shall be displayed:

1. Blower elapsed time (each unit)
2. Blower LCP HOA switch position indication (each unit)
3. Blower RUN indication (each unit)
4. Blower speed indication (each unit)
5. Blower LCP Communication FAIL (each unit)
6. Blower FAIL indication (each unit)
7. Plant SCADA shall provide for operator input to schedule blower on-off cycles.

E. Blower Integral Local Control Panel Functions: The integral panel will communicate with SCADA and the MCC that contains the VFDs via Ethernet IP protocol. The local panel has a number of display and logging capabilities. The panel shall send the above signals to the plant SCADA system.

F. Sequence of Operation:

1. HAND Operation

a. When the HOA switch at the LCP is in the HAND position, the blower runs continuously at the manually adjusted speed until the switch is turned to OFF, a fault occurs, or power to the blower is lost. If power to the blower is lost, RTU-DB may coordinate a staggered restart when power is restored. However, with an HOA switch set to HAND, RTU-DB does not control the pumps and all duty units will start as soon as power is restored.

2. Automatic Operation

a. During normal operation, the LCP HOA switch will be in the AUTO or REMOTE position and RTU-DB will start and stop the blowers and apply any programmed on-off cycles. Therefore, the blower LCP HOA switches should always be left in the AUTO or REMOTE position. The blowers will run as directed by SCADA until the selector switch is turned to OFF, a fault occurs, or power is lost. When power is restored, the RTU is able to stagger restart of the blowers.

3. FAIL Signals

a. The integral blower LCP logs a number of errors. Ethernet communication allows for selecting those errors for communication that are most useful to operators. The following signals are available:

1) Motor oil temperature HIGH
2) Inlet pressure HIGH
3) Blower FAIL

1.11 MISCELLANEOUS SIGNALS

A. Equipment and Instrumentation:

1. Grey text indicates equipment and instrumentation that will be supplied by the general Contractor or under a separate project. Known projects are listed.

TAG NUMBER	DESCRIPTION
TE/TIT	Blower room temperature
TE/TIT (2)	Electrical rooms temperature
AE-OX1 (future) AE-OX1 (future)	AB1 pH probe (AB1 Rehab project) AB3 pH probe

B. Plant SCADA Monitoring Functions: The air compressor is generally a self-contained unit that will start and stop based on system pressure. Plant SCADA shall include monitoring for the following:

1. Blower building blower room temperature indication (future)
2. Blower building electrical rooms temperature indication (each room)
3. Measuerd pH value for each pH probe
4. Low pH setpoint
5. Low pH alarm

1.12 PLANT SCADA FUNCTION SUMMARY TABLE

A. Legend:

1. D – Display on a screen
2. S – Display and operator input on a screen
3. Alarm Level Priority 1
4. Alarm Level Priority 2
5. Alarm Level Priority 3
6. L – Logged to database
7. T – Display on trend

B. The following list may not contain all required plant SCADA functions and signals. The contractor is to do a detailed take-off from all drawings and specifications and determine all required tags and signals.

Signal/Tag Description	Display and Register Type	Alarm Level	Trend/Logging	Notes
Influent Flow	D			For MLR pump control
Blower Running Mode (for each blower)	D		L	Blowers will communicate all
Blower Faulted Mode (for each blower)	D	2	L	signals via Ethernet
Blower Motor High Temp Fault (for each blower)	D	2	L	
Blower Discharge High Temp Alarm (for each blower)				
Blower Comm. Fault (for each blower)	D	2	L	
Blower Current (for each blower)	D		L,T	
Blower Speed Setpoint in Hand Mode (for each blower)	S			
Blower Runtime Hours (for each blower)	D		L	
Other Signals as Needed (for each blower)				

Signal/Tag Description	Display and Register Type	Alarm Level	Trend/Logging	Notes
Aeration Basin Air Flow Rate (for each basin)	D		L, T	As measured by thermal mass air flow meters in the Blower Building
Aeration Basin Out of Service Selection (for each aeration basin including AB2)	S			
DO value (for each zone with DO probe)	D		L, T	
DO Setpoint (for each aerated zone)	S			
DO Control Mode Selection (for each aeration basin)	S			APC (cascade APC and PID), DO with Flow PID and Manual Setpoint
DO Response Time Setpoint (for each cell with DO)	S			
DO Dead band Setpoint (For each cell DO)	S			
DO Control Flow Increase/Decrease Setpoint (for each Bioreactor cell with DO)	S			
Air Flow (for each thermal mass flowmeter)	D		L, T	
Air Flow Totalized Value (for each aeration basin)	D		L	
Air Flow Daily Totalized Value (for each aeration basin)	D		L	
Air Flow Control Valve Local Switch in Remote (for each air flow control valve)	D			
Air Flow Control Valve Position (for each valve)	D		L,T	
Air Flow Control Valve General Fault (for each valve)	D	2	L	
Air Flow Control Valve Communication Fault (for each valve)	D	2	L	
pH Value (for each zone with pH probe)	D		L,T	
pH Low Alarm (for each pH probe)	D	3	L	
pH Alarm Setpoint (for each pH probe)	S			
pH Low-Low Alarm Setpoint (for each pH probe)	S			
Analytical Instrument General Fault (for each probe)	D	2	L	
Analytical Instrument Communication Fault (for each probe)	D	2	L	
Mixer Running Mode (for each Mixer)	D		L	
Mixer Faulted Mode (for each Mixer)	D	2	L	
Mixer Moisture Fault (for each Mixer)	D	2	L	
Mixer Comm. Fault (for each Mixer)	D	2	L	
Mixer Current (for each Mixer)	D		L,T	
Mixer Runtime Hours (for each Mixer)	D		L	
MLR Pump LOS in Auto (for each MLR Pump	D			
MLR Pump Running Mode (for each MLR Pump)	D		L	
MLR Pump Faulted Mode (for each MLR Pump)	D	2	L	
MLR Pump Moisture Fault (for each MLR Pump)	D	2	L	

Signal/Tag Description	Display and Register Type	Alarm Level	Trend/Logging	Notes
MLR Pump Comm. Fault (for each MLR Pump)	D	2	L	
MLR Pump Current (for each MLR Pump)	D		L,T	
MLR Speed Feedback (for each MLR Pump)	D		L,T	
MLR Pump Ratio Setpoint (for each MLR Pump)	S			
MLR Pump Speed Setpoint in Hand Mode (for each MLR Pump)	S			
MLR Pump Runtime Hours (for each MLR Pump)	D		L	
Clarifier Running Mode (for each clarifier)	D			
Clarifier Faulted Mode (for each clarifier)	D	3	L	
Blower Room Temperature	D		L,T	
Electrical Rooms Temperature	D		L,T	

1.13 INPUT/OUTPUT TABLES

A. All signals from the LCP-AB panels will be communicated via Ethernet protocol.

B. All communication with the aeration basin blowers will be by Ethernet protocol.

INPUT/OUTPUT TABLE AERATON BASIN RTU, RTU-AB1/3					
ITEM	**DISCRETE INPUT DI**	**DISCRETE OUTPUT DO**	**ANALOG INPUT AI**	**ANALOG OUTPUT AO**	**NOTES**
AERATION CONTROL LOOP					
Influent Flow				2 (to LCP-AB1,3)	MLR pump speed control
LCP-AB1, 3 General Fault	2 (from LCP-AB1,3)				
LCP-AB1, 3 Communication Fault	2 (from LCP-AB1,3)				
BIP-AB1, 2, 3 General Fault AIT-AB1, 3	2 (from BIP-AB1,3)				
BIP-AB1, 2, 3 Communication Fault, AIT-AB1, 3	2 (from BIP-AB1,3)				
Blower Room Temperature TE/TIT			1 (from TIT)		
Electrical Rooms Temperature TE/TIT			2 (from TIT)		

INPUT/OUTPUT TABLE AERATON BASIN RTU, RTU-AB1/3					
ITEM	**DISCRETE INPUT DI**	**DISCRETE OUTPUT DO**	**ANALOG INPUT AI**	**ANALOG OUTPUT AO**	**NOTES**
Measured DO Value AE-OX1-1,2,3; AE-OX3-1,2,3; AE-SX1-4; AE-SX3-4			6 (from AE-OX)		
Measured pH Value AE-OX1-5; AE-OX3-5			2 (from AE-OX)		
Probe FAIL (DO, pH) AE-OX1-1,2,3; AE-OX3-1,2,3; AE-SX1-4; AE-SX3-4; AE-OX1-5; AE-OX3-5			8 (from AE-OX)		
Measured Air Flow Rate FE/FIT-OX1-1,2,3; FE/FIT-OX3-1,2,3			6 (from FIT)		Each cell, exterior meters
Measured Air Flow Rate FE/FIT (2)			2 (from FIT)		Each AB, future interior meters
Air Flow Control Valve HOA Position Indication FCV-OX1-1,2,3; FCV-OX3-1,2,3	6 (from FCV-OX)				
Air Flow Control Valve Open/Close Command FCV-OX1-1,2,3; FCV-OX3-1,2,3		6 (to FCV-OX)			
Air Flow Control Valve Position Command FCV-OX1-1,2,3; FCV-OX3-1,2,3		6 (to FCV-OX)			
Air Flow Control Valve Position Indication FCV-OX1-1,2,3; FCV-OX3-1,2,3			6 (from FCV-OX)		
Air Flow Control Valve Loss of Air Fault FCV-OX1-1,2,3; FCV-OX3-1,2,3	6 (from FCV-OX)				
Air Flow Control Valve Comm Faults FCV-OX1-1,2,3; FCV-OX3-1,2,3	6 (from FCV-OX)				
CLARIFIER CONTROL LOOP					
Clarifier RUN Indication	3 (from LCP-CLR2,3,4)				
Clarifier FAIL Indication	3 (from LCP-CLR2,3,4)				

INPUT/OUTPUT TABLE AERATON BASIN RTU, RTU-AB1/3					
ITEM	**DISCRETE INPUT DI**	**DISCRETE OUTPUT DO**	**ANALOG INPUT AI**	**ANALOG OUTPUT AO**	**NOTES**
TOTAL	**30**	**12**	**33**	**2**	
Spares	10	4	15	6	
TOTAL Plus SPARE	**40**	**16**	**48**	**8**	

C. All communication with the digester basin blower integral control panels will be by Ethernet protocol.

INPUT/OUTPUT TABLE AERATON BASIN RTU, RTU-DB					
ITEM	**DISCRETE INPUT DI**	**DISCRETE OUTPUT DO**	**ANALOG INPUT AI**	**ANALOG OUTPUT AO**	**NOTES**
AERATION CONTROL LOOP					
Measured Air Flow Rate FE/FIT (3)			3 (from FIT)		Each digester basin discharge pipe
Blower Room Temperature TE/TIT			1 (from TIT)		
Electrical Room Temperature TE/TIT			1 (from TIT)		
TOTAL	**0**	**0**	**5**	**0**	
Spares	4	4	3	4	
TOTAL Plus SPARE	**4**	**4**	**8**	**4**	

END OF SECTION 40 60 10.01

Addendum No. 1
Item No. 3
Photos of the Exhisting Blower Building
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PHOTO OF SOUTH SIDE OF BUILDING

Addendum No. 1
Item No. 3
Photos of the Exhisting Blower Building
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PHOTO OF WEST SIDE OF BUILDING

Addendum No. 1
Item No. 3
Photos of the Exhisting Blower Building
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PHOTO OF EAST SIDE OF BUILDING

Addendum No. 1
Item No. 3
Photos of the Exhisting Blower Building
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PHOTO OF NORTH SIDE OF BUILDING

Addendum No. 1
Item No. 3
Photos of the Exhisting Blower Building
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PHOTO OF EXISTING TURBO BLOWER #1

Addendum No. 1
Item No. 3
Photos of the Exhisting Blower Building
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PHOTO OF EXISTING TURBO BLOWER #2

Addendum No. 1
Item No. 3
Photos of the Exhisting Blower Building
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PHOTO OF EXISTING TURBO BLOWERS #1 AND #2

Addendum No. 1
Item No. 3
Photos of the Exhisting Blower Building
(Page 8 of 9)

PHOTO OF PLENUM ROOM

Addendum No. 1
Item No. 3
Photos of the Exhisting Blower Building
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PHOTO OF INSIDE SOUTH AND WEST WALLS