WACO METROPOLITAN AREA REGIONAL SEWERAGE SYSTEM

ADDENDUM NO. 1

FOR

BULL HIDE CREEK
WASTEWATER TREATMENT PLANT

Prepared By:

Lockwood, Andrews & Newnam, Inc.
A LEO A DALY COMPANY

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Issued
June 18, 2010

Lockwood, Andrews & Newnam, Inc.
A LEO A DALY COMPANY

June 18, 2010

From: Lockwood, Andrews & Newnam, Inc.
2925 Briarpark Drive, Suite 400
Houston, Texas 77042

Attention: All Plan Holders

Reference: **Bull Hide Creek Wastewater Treatment Plant**
Addendum No. 1

Notice is hereby given that the following additional information and changes shall become part of the Contract Documents of the above referenced project.

In summary, this Addendum No. 1 includes:

- Responses to Questions – Refer to Items 1 through 45 in the appropriate Section of this Addendum for detailed responses to questions.
- Clarifications – Refer to Items 1 through 11 in the appropriate Section of this Addendum for detailed responses to clarifications.
- Specification Revisions – Refer to Items 1 through 20 in the appropriate Section of this Addendum for detailed specification revisions.

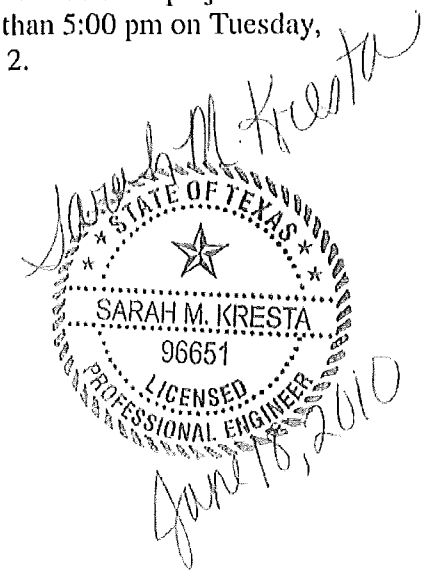
Plan Holders should note that the information contained herein does not address all formal questions received to date regarding the aforementioned project. All outstanding questions shall be addressed in Addendum No. 2. All questions pertaining to the aforementioned project must be received by the Program Manager, Tara Hickey, in writing, no later than 5:00 pm on Tuesday, June 22, 2010, in order to be included and addressed in Addendum No. 2.

Sincerely,

Sarah Kresta

Sarah M. Kresta, P.E.
Associate/Project Manager

Attachments



Lockwood, Andrews & Newnam, Inc.
A LEO A DALY COMPANY

ADDENDUM NO. 1

WMARSS, TEXAS
BULL HIDE CREEK WASTEWATER TREATMENT PLANT

RESPONSES TO QUESTIONS:

1. Question: 13400 – 1.6.C.2.a – It appears that "point-to-point" wiring drawings may be required, please clarify whether point-to-point drawings are required.

   Response: Yes these are required.

2. Question: 13400 – 1.6.C.7.b.2.e – Are Field bus devices a part of the instrumentation for this project and where are they identified?

   Response: In this case the field bus is Ethernet, as shown on the System Architecture.

3. Question: We could not find a specification for the HMI product required for this project. Please provide us with HMI products required or approved.

   Response: HMI software is to be Wonderware InTouch, as provided by Invensys.

4. Question: 13421 – At the end of this Section there is a list of field devices but the drawings include many more devices than are on the list provided. Please clarify which field devices are to be supplied by the Systems Integrator and which are provided by others.

   Response: Complete instrument list provided as part of Addendum No. 1

5. Question: Section 13412 identifies UPS equipment to be provided. However, some of the systems identified are to be provided by others (i.e. UV & Blowers). Are the suppliers of these systems providing the UPS equipment or is the Systems Integrator providing all of the UPS equipment?

   Response: Systems Integrator to provide all UPSs. Refer to Clarification 1 below for explanation of Systems Integrator versus Systems Programming and Configuration.

6. Question: Bid alternate #6 – Please provide details for this alternate.

   Response: Additional security equipment information will be provided as part of Addendum No. 2.

7. Question: Revere Control Question – Bid alternate #7 – If the Owner or others provide these services, submittals, factory test, startup, site acceptance and warranty will be altered. Please provide guidelines on the responsibilities for the Systems Integrator and the party providing these services.

   Response: Systems Integrator shall be responsible for hardware submittals. Factory test shall be a hardware test only. In addition, Systems Integrator shall provide support for startup and site acceptance testing (hardware and system interconnection design). Warranty shall be on hardware. Refer to Clarification 1 below for explanation of Systems Integrator versus Systems Programming and Configuration.

8. Question: Drawing N-607 Sheet 1 includes asterisk with many of the instruments which would indicate furnished with equipment. However Sheet 2 indicates to be provided by Contractor. We would appreciate clarification.

   Response: The same devices with an asterisk in N-607 shall also apply to N-608.

9. Question: Drawing N-609 indicates that PI 1002 & 2012 are to be provided with the blowers but these instruments also show up on the instrument list (13421-5). Is the blower manufacturer or the Contractor to supply?

   Response: Pressure gauges PI-1002 and -2012 shall be provided by the Contractor.

10. Question: The I/O list included in Section 13440, page 9 does not include any digital outputs but the drawings do. Is it safe to assume that the drawings identify all of the digital outputs that are required?

    Response: Complete I/O list provided as part of Addendum No. 1

11. Question: We would appreciate clarification on the requirement to provide a local control panel. Section 11176 2.1.C indicates that the Systems Integrator is to provide "control panel hardware". Section 13405 3.13.B indicates there is a local selector for each pump. Is the Systems Integrator to supply the local controls for each of these pumps?

    Response: As outlined in Section 11176, paragraph 2.1.C, the System Integrator shall provide the local control panel for the NPW system. This control panel shall include the PLC, LOR switches, pilots, PLC program and other controls-related equipment necessary to provide operation, as stated in Section 13405. Panels shall comply with the appropriate Sections in Division 13.

12. Question: Specification Section 13412, paragraph 1.1 indicates that the supervisory PLC panel should include a 1 KVA UPS and drawing N-500 indicates a 1.5 KVA UPS.

    Response: Supervisory PLC panel shall have a 1.5 kVA UPS.

13. Question: Specification Section 13412, paragraph 1.1 indicates that the Clarifier PLC panel should include a 700 VA UPS and drawing N-501 indicates a 1.5 KVA UPS.

    Response: The Clarifier PLC panel shall have a 1.0 kVA UPS.

14. Question: Specification Section 13412, paragraph 1.1 indicates that the Lift Station PLC panel should include a 700 VA UPS and drawing N-500 indicates a 1.0 KVA UPS.

    Response: The Lift Station PLC panel shall have a 1.0 kVA UPS.

15. Question: Is there a requirement to provide any level of installed spare I/O points? The specification mentions 25% spare control panel space for the control panels but no specific spare I/O requirement.

    Response: There shall be 20% installed spare I/O for each type of point.

16. Question: Regarding Section 11264, Chemical Storage & Feed System, paragraph 1.1-A states "... the alum storage and feed system as shown on the drawings" ... "two metering pumps CFU-1210 and 1211, totes, rotameter for motive water, chemical injection system, piping, valves, mixers, appurtenances, monitoring equipment, ..." and paragraph 2.4-A.2 states "Metering pumps shall be 110v." Sheet D-121 shows the alum pumps and a storage tote located at MLQ discharge of BNR. Are the pumps located on a pad at Elev. 538.25?

    Response: Pumps shall be mounted on shelf and provided with small canopy for weather protection. Details shall be provided as part of Addendum No. 2.

17. Question: Regarding Specification Section 11264, Chemical Storage and Feed System, how many (alum) totes are to be furnished?

    Response: Totes to be furnished by WMARSS.

18. Question: Regarding Specification Section 11264, Chemical Storage and Feed System, how much chemical is to be furnished?

    Response: Chemical to be furnished by WMARSS.

19. Question: Sheet E-601 shows circuit P2135 feeding Alum Feed CP 1210 with 480v, 3ph power. Please clarify power requirements for pumps.

    Response: Power requirement is 110-volt. Revised drawings to be provided as part of Addendum No. 2.

20. Question: Please provide schematic for the control panel.

    Response: Control panel to be furnished by pump supplier.

21. Question: Is the control panel to be furnished by pump supplier or by the electrical Contractor?

    Response: Control panel to be furnished by pump supplier.

22. Question: Sheet E-601 shows circuit P2140 feeding Hypochlorite Feed CP 1240 with 480v, 3ph power and Sheet E-145 shows circuit P2140 & CP 1240 at the UV Structure. Is a Hypochlorite feed system required?

    Response: Yes, refer to Specification Section 11176, paragraph 2.4.C.

23. Question: Regarding Sheet D-145 – UV Structure Plan; is the Auto Sampler to be furnished & installed by the Contractor? Provide specifications.

    Response: Auto-sampler at UV discharge shall be provided by WMARSS; however, Contractor shall be responsible for installation including all associated instrument, communications, power, and plumbing connections to the sampler.

24. Question: Regarding Sheet D-150 – Sludge Dewatering Plan; are three 25cy Heavy Duty Vacuum Load Containers to be furnished & installed by the Contractor?

    Response: Yes.

25. Question: Regarding Sheet D-150 – Sludge Dewatering Plan; what provides the Vacuum?

    Response: By Others.

26. Question: Regarding Sheet D-150 – Sludge Dewatering Plan; what is the process sequence for the use of the containers?

    Response: Containers are used for temporary sludge storage, fed by double disk sludge pumps from RDT and unloaded by WMARSS vacuum truck or same double disk sludge pumps.

27. Question: Regarding Sheet D-160 – Biofilters; Please provide additional requirements (CFM, HP, etc) for the Verantis Model CHP-6 Fans.

    Response: Additional fan information to be provided as part of Addendum No. 2.

28. Question: Regarding Sheet D-160 – Biofilters; is the foul air ductwork to be PVC Gravity Sewer Pipe, SDR 26 per Sheet D-150 note 18?

    Response: Yes.

29. Question: Regarding Sheet D-160 – Biofilters; is the ductwork in the biofilters PVC Gravity Sewer Pipe, SDR 26?

    Response: Yes.

30. Question: Regarding Sheet D-160 – Biofilters; Please provide requirements for all dampers in the foul air ductwork.

    Response: Damper requirements to be provided via drawing revision as part of Addendum No. 2.

31. Question: Regarding Sheet D-160 – Biofilters; Please provide name of supplier for the screened compost wood chips & screened wood chips.

    Response: Supplier to be Contractor's option.

32. Question: Please clarify supplier of polymer system. Sheets D-150, D-350 (Keynote 7) indicates that the polymer system is supplied by Owner and Specification 11362 (part 1.1 & part 2.4.B) indicate the polymer system is supplied by Contractor.

    Response: Keynote 7 on Sheets D-150 and D-350 shall be modified as part of Addendum No. 2 to state: Contractor to provide complete and functional polymer system per Specification 11362.

33. Question: Please clarify post RDT sludge handling. Sheets D-150, D-350 show discharge into FRP sludge suction tube and pumping to containers and Specification 11362 (part 1.1 & part 2.4.H) indicate direct gravity discharge into containers.

    Response: Section 11362, paragraph 2.4.H, modified as part of Addendum No. 1 for clarity.

34. Question: Regarding Sheet - D-145; Please provide specification for the Parshall flume.

    Response: Information for Parshall flume to be provided as part of Addendum No. 2.

35. Question: Going over the Plans & Specs they have MX-301 & MX-351 Anaerobic Mixers and the MX-311 & MX-361 Anoxic Mixers. The same Drawing has MX-341 & MX-391 Mixers but the Specs do not have these 2 Mixers. In looking through the History I found that there were a total of 6 Mixers that Chemineer provided Budget Pricing for. Please advise as to the prober amount of mixers.

    Response: MX-341 and MX-391 will be installed in the future, and are not part of this project.

36. Question: Spec Section 02317-4 3.2 B. Building Slabs on Grade, is calling for the Contractor to over excavate 36" and backfill with select fill material. 02317-5 3.3 B. calls for the Contractor to over excavate slabs on grade (including the ABEM Building) 3' and backfill with cement stabilized sand or lean concrete. On the drawings, Sheet S-322, the Sections show an over excavation of 4', and backfilling with select fill at the ABEM Building. Are we to over excavate all slabs on grade 36" and backfill with select fill, over excavate the ABEM building by 4' and the remainder of the slabs on grade by 3' and backfill with select fill, or over excavate all slabs on grade by 3' and backfill with cement sand or lean concrete?

    Response: All slabs should be over-excavated a MINIMUM of 3 feet and backfilled with compacted select fill or compacted bank sand or cement-stabilized sand. If pockets of poor soil are encountered, additional excavation may be necessary. Extent of additional excavation, if required, will be determined in conjunction with geotechnical engineer or his representative and shall be considered as additional work.

37. Question: Regarding Aluminum Grating, Drawing No. S-001, Grating & Handrail, Note Number 2 and Specification Section 05500, Miscellaneous Metals, Paragraph 3.1.C and Paragraph 3.1.F; drawing S-001 indicates "HD Extruded Plank Type Grating" and Specifications indicate "pressure located aluminum grating". Please identify which type of aluminum grating is to be utilized.

    Response: The aluminum grating and treads shall be HD Extruded Plank, as described in the drawings. Specification 05500 revised as part of Addendum No. 1 to coordinate with the drawings.

38. Question: I realize there is a pending addendum which will denote all aluminum grating to be "Plank" type grating. In passing, this type of grating is available in three types: Unpunched, Rectangular Punched and Square Punched. I am assuming the revised specification will denote which type is to be utilized. I am assuming grating at the Biofilters would be the "Punched" type allow for drainage. The grating at the Disc Filters – Punched or Unpunched? Balance of Plant Grating and Stair Treads – Punched or Unpunched?

    Response: The grating must be punched, and may be rectangular punched or square punched.

39. Question: Regarding S-001, Note 4 of Foundation notes; are the 4" sand and the 2" seal slab both required?

    Response: A 2-inch minimum seal slab is required for foundations below grade. A seal slab is not required below slabs at or above grade, such as the blower building. A 4-inche layer of sand may be placed below the seal slab for Contractor's convenience in leveling the prepared grade area. The sand layer is not REQUIRED; however, it may be convenient under the building slab to avoid punching holes in the water barrier.

40. Question: Regarding S-001, Note 4 of Foundation notes; Item 10 calls for 40X slab thickness or 30 feet for C.J. in slabs. Second sentence says No C.J.'s unless shown. Which has precedence?

    Response: The first sentence deals only with slabs. These are vertical joints. Horizontal joints are not allowed, except as shown. The maximum spacing of construction joints is 40 x the slab depth or 30 feet, whichever is less. Contractor may determine locations. The second sentence deals with walls (such as at the BNR or clarifier). The maximum spacing of joints in walls is 30 feet. The vertical joints will be located by the Contractor. Horizontal joints are not anticipated because the wall is less than 30 feet tall, except as shown on the drawings (such as at the top of the taper). If the Contractor has a reason to require any additional horizontal joints, this can be discussed. The third sentence has to do with beams and "wall beams" (such as those at the sides of the Headworks troughs). Horizontal joints are not desired in these members, except as shown on the drawings. For example, the beam or "wall-beam" should not be poured half height with a joint at mid-height. Vertical bulkheads may be formed for Contractor convenience; however, each pour must be made full height, without any joints, except as shown.

41. Question: Section 13121, Structural Design Criteria, Item 1.3, SubSection A. This loading seems extremely excessive for the Waco, Texas area. The 200 lb concentrated load (over a 1' x 1' area) and collateral loading of 10 lbs psf will have the following repercussions:
    a. Normal purlin spacing of 5'-0" will have to be reduced to approximately 2'-6".
    b. Minimum gage of shorter bay prulins will be increased from 16 gage to 12 gage.
    c. The primary 27'-11" rigid frames will need to be calculated for approximately a 40' span building.

    Response: Specification has been modified as part of Addendum No. 1 to remove the requirement for the 200 lb concentrated load; however, the collateral loading of 10 lbs psf shall be maintained.

42. Question: Section 13121, Structural Design Criteria, Item 1.3, SubSection A. Suggestions for review: Replace all of the design loading criteria with the following:
    a. Refer to the current, almost universal, code of IBC (International Building Code, 2006 edition).
    b. State the wind velocity for the Waco, Texas area (I believe that is 90 mph).
    c. Specify the collateral loading to be 5 lbs this will take care of A/C ducts, acoustical ceilings, lighting, etc., typical for office and warehouse construction.
    d. L/180 loading is standard for most metal building applications.
    e. Primary frame reduction of 12/20 is generally acceptable.

    Response: Items a, b, d, and e are acceptable; however, the suggested provisions for collateral loading are not acceptable and shall be provided as specified. Specification will be modified by Addendum No. 2.

43. Question: Section 13121, Quality Assurance, Item 1.6, Sub-Section C.
    a. The use of three roof skylights installed in a contiguous manner complete prohibits UL 90 certification.
    b. Installing skylights in this manner is not recommended even if the UL 90 requirement is abandoned.
    c. The standing seam roof with individual skylights is acceptable for UL 90 ratings.

    Response: The design intent is to use the pre-engineered building manufacturer's standard skylights in the locations noted.

44. Question: Section 13121. We are assuming that the roof pitch of the building is 2:12, please verify.

    Response: The slope is 2:12.

45. Question: Skylights in plans (Sheet A-122) will require special order construction and could cost as much as $3-4K. Standard skylights would run in the ball park of $200.

    Response: The design intent is to use standard skylights that are part of the pre-engineered building manufacturer's system.

CLARIFICATIONS:

1. Clarification: Systems Integrator shall be responsible for coordination between instruments, communications and controls. This shall include responsibility for specification and procurement of all instrumentation and control, hardware, assembly, and wiring. Systems Programming and Configuration may be accomplished by Systems Integrator if applicable Bid Alternate is selected by the Owner. Systems Programming and Configuration shall be by others under the Base Bid.

2. Clarification: Specification 11289, paragraph 2.2.A.5, allows for consideration of acceptable substitutions; therefore, Golden Harvest will be evaluated by Owner and Engineer as a potential substitution.

3. Clarification: Specification 11312, paragraph 2.2.A, does NOT allow for consideration of acceptable substitutions; therefore, Kruger will not be evaluated by Owner and Engineer as a potential substitution.

4. Clarification: Specification 11319, paragraph 2.2.A.3, allows for consideration of acceptable substitutions; therefore, KSB and Homa will be evaluated by Owner and Engineer as a potential substitutions.

5. Clarification: Specification 11319, paragraph 2.2.B, does NOT allow for consideration of acceptable substitutions; therefore, Homa will not be evaluated by Owner and Engineer as a potential substitution.

6. Clarification: Specification 11332, paragraph 2.2.A.5, allows for consideration of acceptable substitutions; therefore, Waste Tech will be evaluated by Owner and Engineer as a potential substitution.

7. Clarification: Specification 11362, paragraph 2.2.A.4, allows for consideration of acceptable substitutions; therefore, Waste Tech will be evaluated by Owner and Engineer as a potential substitution.

8. Clarification: All metal stairs with intermediate landings shall be designed and detailed by the stair manufacturer. Intermediate stair landing column foundations shall be as shown in Detail 11 on Sheet S-004. Details for stair stringer connections at the top and bottom of all stairs shall be as shown in Details 6 and 7 on Sheet S-004, respectively.

9. Clarification: All materials, labor, tools, equipment, fuel, electricity, water, etc. required to facilitate equipment start-up shall be the responsibility of the Contractor, as specified under Section 01655, paragraph 1.1.C.

10. Clarification: Owner shall be responsible for demolition of two existing, abandoned home sites currently located on the plant property. Anticipated timeline for completion of this work is August 2010.

11. Clarification: Drawings may not show all conduit and wire routing from power panels to landing points for 110-volt circuits; however, Contractor is responsible for the provision of all materials required to provide a working system.

TECHNICAL SPECIFICATION REVISIONS:

1. Regarding Section 01110, delete paragraph 1.2.B.6 in its entirety.

2. Regarding Section 01110, add paragraph 1.5.F as follows:

   "Contractor's use of Owner's existing barn structure designated to remain, for the purposes of material and/or equipment storage during construction, shall be allowed; however, Contractor shall be responsible for any and all repairs associated with returning the barn structure to its pre-construction condition or better prior to demobilization."

3. Regarding Section 01110, add paragraph 1.5.G as follows:

   "Concurrent construction activities by wastewater interceptor and bonus feature Contractors either on and/or adjacent to proposed wastewater treatment plant site shall occur during the course of Contactor's work. Coordinated use of Contractor's access road and/or access to Contactor's work area may be required and shall be coordinated by the Contractor, in conjunction with the Owner's Inspector. Contractor shall coordinate with other Contractors, as necessary, to facilitate all respective projects."

4. Regarding Section 01110, add paragraph 1.5.H as follows:

   "Burning of trash, trees or other materials generated by the Contractor in association with the completion of the work, or burning of any materials within the designated project limits or on the Owner's property, shall not be permitted. Contractor shall be permitted to chip and temporarily stockpile cleared material on-site at location designated by the Owner. Contractor shall subsequently spread chipped material on-site at location(s) designated by Owner prior to demobilization."

5. Regarding Section 01500, delete paragraph 1.2.D.1.a in its entirety and replace with the following:

   "New or reconditioned 200 square foot mobile office trailer."

6. Regarding Section 01500, delete paragraph 1.2.D.8.b in its entirety and replace with the following:

   "Contractor shall provide telephone service, including long-distance coverage. In particular, two (2) service lines and associated telephone handsets shall be provided. Service line for fax machine, as well as provisions for Wi-Fi internet service capability, shall also be provided."

7. Regarding Section 01500, delete paragraph 1.3.C in its entirety and replace with the following:

   "Power. Contractor shall make arrangements with local utility company, Oncor, for the provision of temporary electric power service with ground fault protection, including but not limited to all necessary temporary wiring, panels, use outlets, switches, and lighting, as required to facilitate the prosecution of the work, throughout the duration of construction."

8. Regarding Section 01770, add the following to the end of paragraph 1.4.C.7:

   "Where multiple items are shown, highlight item being supplied in the equipment furnished."

9. Regarding Section 05500, delete paragraph 3.1.C in its entirety and replace with the following:

   "Aluminum Stair Treads. Stair treads shall HD extruded plank type treads. Tread shall have a cast aluminum abrasive nosing for its full length. Length and width of treads shall be as shown on the drawings. Stair treads shall have mill finish. Treads shall be bolted to the aluminum stair stringers with Type 304 stainless steel bolts."

10. Regarding Section 05500, delete paragraph 3.1.F.1 in its entirety and replace with the following:

    "Aluminum grating shall be HD plank type grating."

11. Regarding Section 06632, delete paragraph 2.1 in its entirety and replace with the following:

    "Acceptable manufacturers include Fibergrate Composite Structures "Safe-T-Span", Strongwell "DuraDek", Gibraltar Industries Company "AMICO/SEASAFE", and Reinforced Plastics, Inc."

12. Regarding Section 08225, delete paragraph 2.1 in its entirety and replace with the following:

    "Corrim Company, Chem-Pruf Door Company, Fib-R-Dor division of Advanced Fiberglass, Inc., or Simon Door."

13. Regarding Section 11225, delete paragraph 2.4.O.2 in its entirety and replace with the following:

    "Coating. All structural steel components and scum skimmer components shall be hot dipped galvanized. All other metal components not factory painted shall be hot dip galvanized coated. All painted items shall be coated in accordance Section 09928, Protective Coatings for Wastewater Systems."

14. Regarding Section 11266, delete paragraph 2.5.H.12 in its entirety.

15. Regarding Section 11362, delete paragraph 2.4.H in its entirety and replace with the following:

    "Sludge Chute. Provide a fabricated Type 304 stainless steel discharge chute with side guards and sufficient length and installation angle to direct dewatered sludge away from the rotary drum thickener and into and into a sludge collection tube prior to the sludge pumps."

16. Regarding Section 13121, delete paragraph 1.3.A in its entirety and replace with the following:

    "Roof covering shall be designed for either 30 psf uniformly distributed load (over a 1' by 1' area) located at center of maximum roofing (panel) span. The most severe conditions shall govern."

17. Regarding Section 13412, delete and replace applicable items list provided under paragraph 1.1 as follows:

    "Supervisory PLC Panel 1500VA
    Lift Station PLC Panel 1000VA
    Clarifier PLC Panel 1000VA
    RDT PLC Panel 1000VA"

18. Regarding Section 13421, delete Instrument List in its entirety and replace with attached document.

19. Regarding Section 13440, delete I/O List in its entirety and replace with the attached document.

20. Regarding Section 15139, add paragraph 2.1.C.10 as follows:

    "When limit switches are called for on instrument drawings for manually operated valves, the valve supplier or manufacturer shall provide with the valve."

END OF ADDENDUM NO. 1

Lockwood, Andrews & Newnam, Inc.
A LEO A DALY COMPANY

Signature below certifies that Plan Holder has received **Addendum No. 1** that its contents are understood.

_____
(Signature)

_____
(Print name)

_____
(Company name)

_____
(Date)

ATTACHMENTS:
RE-ISSUED TECHNICAL SPECIFICATION SECTIONS

Section 13421, Instruments
Analytical Instrument Schedule

TAG	NUMBER	LOCATION	SERVICE	TYPE	MOUNTING	RANGE	UNITS	OUTPUT	COMMENTS	MANUFACTURER/MODEL
AE	315, 325, 335, 345, 365, 375, 385, 395	AERATION TANKS	INFLUENT	DO PROBE	BALL FLOAT MOUNT	0-20	mg/L	N/A	SUPPLY WITH 33' CABLE	HACH LDO SERIES WITH BALL FLOAT MOUNT KIT
AE	316, 366	AERATION TANKS	INFLUENT	ORP PROBE	IMMERSION MOUNT	-1500 - 1500	mV	N/A	SUPPLY WITH 33' CABLE	HACH pHD sc DIGITAL DIFFERENTIAL ORP SENSOR SERIES WITH IMMERSION MOUNT
AE	346	AERATION TANKS	TANKS DISCHARGE	pH PROBE	IMMERSION MOUNT	0-14	SU	N/A	SUPPLY WITH 33' CABLE	HACH pHD sc DIGITAL DIFFERENTIAL ORP SENSOR SERIES WITH IMMERSION MOUNT
AIT	315, 365	AERATION TANKS	INFLUENT	TRANSMITTER	2" HANDRAIL MOUNT			2 X 4-20 mA	NEMA 4X, DUAL-CHANNEL TRANSMITTER FOR AE-315 AND AE-365	HACH sc100 WITH WEATHER PROTECTION SHIELD
AIT	316, 366	AERATION TANKS	INFLUENT	TRANSMITTER	2" HANDRAIL MOUNT			2 X 4-20 mA	NEMA 4X, DUAL-CHANNEL TRANSMITTER FOR AE-316 AND AE-366	HACH sc100 WITH WEATHER PROTECTION SHIELD
AIT	325, 375	AERATION TANKS	INFLUENT	TRANSMITTER	2" HANDRAIL MOUNT			2 X 4-20 mA	NEMA 4X, DUAL-CHANNEL TRANSMITTER FOR AE-325 AND AE-375	HACH sc100 WITH WEATHER PROTECTION SHIELD
AIT	335, 385	AERATION TANKS	INFLUENT	TRANSMITTER	2" HANDRAIL MOUNT			2 X 4-20 mA	NEMA 4X, DUAL-CHANNEL TRANSMITTER FOR AE-335 AND AE-385	HACH sc100 WITH WEATHER PROTECTION SHIELD
AIT	345, 395	AERATION TANKS	INFLUENT	TRANSMITTER	2" HANDRAIL MOUNT			2 X 4-20 mA	NEMA 4X, DUAL-CHANNEL TRANSMITTER FOR AE-345 AND AE-395	HACH sc100 WITH WEATHER PROTECTION SHIELD
AIT	346	AERATION TANKS	TANKS DISCHARGE	TRANSMITTER	2" HANDRAIL MOUNT			2 X 4-20 mA	NEMA 4X, DUAL-CHANNEL TRANSMITTER FOR AE-346	HACH sc100 WITH WEATHER PROTECTION SHIELD
AE	1312	DISCHARGE	EFFLUENT	DO PROBE	IMMERSION MOUNT	0-20	mg/L	N/A	SUPPLY WITH 33' CABLE	HACH LDO SERIES WITH IMMERSION MOUNT KIT
AE	1314	DISCHARGE	EFFLUENT	pH PROBE	IMMERSION MOUNT	0-14	SU	N/A	SUPPLY WITH 33' CABLE	HACH pHD sc DIGITAL DIFFERENTIAL ORP SENSOR SERIES WITH IMMERSION MOUNT
AIT	1312, 1314	DISCHARGE	EFFLUENT	TRANSMITTER	2" HANDRAIL MOUNT			2 X 4-20 mA	NEMA 4X, DUAL-CHANNEL TRANSMITTER FOR AE-1312 AND AE-1314	HACH sc100 WITH WEATHER PROTECTION SHIELD

Section 13421, Instruments
Flow Instrument Schedule

TAG	NUMBER	LOCATION	SERVICE	TYPE	MOUNTING	RANGE	UNITS	OUTPUT	COMMENTS	MANUFACTURER/MODEL
FE/FIT	104	LIFT STATION	RAW SEWAGE	MAGMETER	12" FLANGED, 150#	0-6.5	MGD	4-20 mA	SUPPLY WITH INTEGRAL-MOUNT TRANSMITTER, DISPLAY FACING NORTH	FLOWTUBE, TOSHIBA LF430 SERIES; TRANSMITTER, TOSHIBA LF600 SERIES
FE/FIT	327, 337, 347, 377, 387, 397	BNR	AIR	THERMAL DISPERSION	3/4" NPT, INSERTION SENSOR	TBD	SCFM	4-20 mA	WELDED 316SS CONSTRUCTION, REMOTE DISPLAY, HAND RAIL MOUNT, WITH FLOW CONDITIONER AND SUNSHIELD	FLUID COMPONENTS ST98 SERIES FLOW METER AND VORTAB VMR SERIES FLOW CONDITIONER
FE/FIT	400	INTERNAL RECYCLE	RECYCLE WATER	ULTRASONIC, DOPPLER-TYPE	EXTERNAL TRANDUCERS	0-2.0	MGD	4-20 mA	SUPPLY WITH REMOTE-MOUNT TRANSMITTER AND PIPE THICKNESS GAUGE	SIEMENS SITRANS FUS1010 SERIES
FE/FIT	526	BLOWERS	AIR	THERMAL DISPERSION	3/4" NPT, INSERTION SENSOR	TBD	SCFM	4-20 mA	WELDED 316SS CONSTRUCTION, REMOTE DISPLAY, WALL MOUNT ON EAST BNR WALL 48" ABOVE GRADE	FLUID COMPONENTS ST98 SERIES FLOW METER
FE/FIT	700, 703	RAS	RAS	MAGMETER	6" FLANGED, 150#	0-6.5	MGD	4-20 mA	SUPPLY WITH INTEGRAL-MOUNT TRANSMITTER, DISPLAY FACING SOUTH, WITH SUNSHIELD SHADING DISPLAY	FLOWTUBE, TOSHIBA LF430 SERIES; TRANSMITTER, TOSHIBA LF600 SERIES
FE/FIT	742, 752	RAS	RAS	MAGMETER	4" FLANGED, 150#	0-4.0	MGD	4-20 mA	SUPPLY WITH INTEGRAL-MOUNT TRANSMITTER, DISPLAY FACING SOUTH, WITH SUNSHIELD SHADING DISPLAY	FLOWTUBE, TOSHIBA LF430 SERIES; TRANSMITTER, TOSHIBA LF600 SERIES
FSL	1301	NPW	NON-POTABLE WATER	THERMAL-DISPERSION FLOW SWITCH	1/2" NPT	0.01-3.0	FT/S	1 DPDT CONTACT	SUPPLY WITH SEPARATE DRY CONTACT	FCI FLT93S SERIES
FSL	1302	NPW	NON-POTABLE WATER	THERMAL-DISPERSION FLOW SWITCH	1/2" NPT	0.01-3.0	FT/S	1 DPDT CONTACT	SUPPLY WITH SEPARATE DRY CONTACT	FCI FLT93S SERIES
LE	1320	EFFLUENT FLUME	EFFLUENT	ULTRASONIC LEVEL TRANSDUCER	3/4" NPT	1-33	FT	N/A	SUPPLY WITH 30' CABLE	SIEMENS/MILLTRONICS XPS-10
FIT	1320	EFFLUENT FLUME	EFFLUENT	ULTRASONIC LEVEL TRANSMITTER	VERTICAL CHANNEL MOUNT	0-6.5	MGD	4-20 mA	REMOTE-MOUNT, DISPLAY FACING NORTH	SIEMENS/MILLTRONICS HYDRORANGER 200

LEVEL INSTRUMENT SCHEDULE

TAG	NUMBER	LOCATION	SERVICE	TYPE	ELEVATION	RANGE	UNITS	OUTPUT	COMMENTS	MANUFACTURER/MODEL
LIT	100	LIFT STATION	RAW SEWAGE	SUBMERSIBLE LEVEL TRANSMITTER	511.00	0-180	IN H20	4-20 mA	SUPPLY WITH 50' CABLE, DESSICANT TERMINATION BOX, CLASS 1/DIV. 1 RATED	DWYER PBLTX
LSLL	113	LIFT STATION	RAW SEWAGE	FLOAT SWITCH	511.60	N/A	N/A	NC CONTACT	SUPPLY WITH 50' CABLE, CLASS 1/DIV. 1 RATED	SIEMENS 9GEF
LSL	113	LIFT STATION	RAW SEWAGE	FLOAT SWITCH	512.00	N/A	N/A	NC CONTACT	SUPPLY WITH 50' CABLE, CLASS 1/DIV. 1 RATED	SIEMENS 9GEF
LSM	113	LIFT STATION	RAW SEWAGE	FLOAT SWITCH	512.50	N/A	N/A	NO CONTACT	SUPPLY WITH 50' CABLE, CLASS 1/DIV. 1 RATED	SIEMENS 9GEF
LSH	113	LIFT STATION	RAW SEWAGE	FLOAT SWITCH	513.50	N/A	N/A	NO CONTACT	SUPPLY WITH 50' CABLE, CLASS 1/DIV. 1 RATED	SIEMENS 9GEF
LSHH	113	LIFT STATION	RAW SEWAGE	FLOAT SWITCH	514.50	N/A	N/A	NO CONTACT	SUPPLY WITH 50' CABLE, CLASS 1/DIV. 1 RATED	SIEMENS 9GEF
LE	201/201A	HEADWORKS	SCREENINGS	ULTRASONIC LEVEL TRANSDUCER	TBD	1-33	FT	N/A	SUPPLY WITH 30' CABLE	SIEMENS/MILLTRONICS XPS-10
LIT	201	HEADWORKS	SCREENINGS	ULTRASONIC, DIFFERENTIAL LEVEL	TBD	0-3	FT	4-20 mA	CONFIGURED FOR DIFF. LEVEL, SUPPLY WITH OPAQUE SUNSHIELD TO PROTECT LCD DISPLAY	SIEMENS/MILLTRONICS HYDRORANGER 200
LIT	620	SCUM VAULT	SCUM/MIXED LIQUOR	SUBMERSIBLE LEVEL TRANSMITTER	526.25	0-192	IN H20	4-20 mA	SUPPLY WITH 50' CABLE, DESSICANT TERMINATION BOX	DWYER PBLTX
LSH	805	DISC FILTER NO. 1	CLARIFIER EFFLUENT	FLOAT SWITCH	TBD	N/A	N/A	NO CONTACT	SUPPLY WITH 25' CABLE	GEMS SENSORS LS-750
LSH	955	DISC FILTER NO. 2	CLARIFIER EFFLUENT	FLOAT SWITCH	TBD	N/A	N/A	NO CONTACT	SUPPLY WITH 25' CABLE	GEMS SENSORS LS-750
LSLL	1300	NPW SUMP	NON-POTABLE WATER	FLOAT SWITCH	TBD	N/A	N/A	NC CONTACT	SUPPLY WITH 50' CABLE	SIEMENS 9GEF

Section 13421, Instruments
Pressure Instrument Schedule

TAG	NUMBER	LOCATION	SERVICE	TYPE	MOUNTING	RANGE	UNITS	OUTPUT	COMMENTS	MANUFACTURER/MODEL
PI	101, 102,103	LIFT STATION	RAW SEWAGE	PRESSURE GAUGE	1/2" NPT, BOTTOM	0-100	PSI	N/A	316SS CASE, LIQUID-FILLED, PROVIDE WITH DIAPHRAGM SEAL	WIKA 233.54 SERIES
PI	202, 205, 207	HEADWORKS	NON-POTABLE WATER	PRESSURE GAUGE	1/2" NPT, BOTTOM	0-100	PSI	N/A	316SS CASE, LIQUID-FILLED, PROVIDE WITH DIAPHRAGM SEAL	WIKA 233.54 SERIES
PI	206	HEADWORKS	GRIT	PRESSURE GAUGE	1/2" NPT, BOTTOM	0-100	PSI	N/A	316SS CASE, LIQUID-FILLED, PROVIDE WITH DIAPHRAGM SEAL	WIKA 233.54 SERIES
PI	401	INTERNAL RECYCLE	RECYCLE WATER	PRESSURE GAUGE	1/2" NPT, BOTTOM	0-100	PSI	N/A	316SS CASE, LIQUID-FILLED, PROVIDE WITH DIAPHRAGM SEAL	WIKA 233.54 SERIES
DPSH	401	INTERNAL RECYCLE	RECYCLE WATER	DIFFERENTIAL PRESSURE SWITCH	1/4" NPT, SIDE	2-20	PSI	DUAL SWITCH	INTERNAL SETPOINT ADJUSTMENT	UNITED ELECTRIC J402K SERIES
PIT	520A, 521A, 522A, 520B, 521B, 522B	BLOWERS	AIR	PRESSURE TRANSMITTER	1/2" NPT, BOTTOM	0-25	PSI	4-20 mA		ROSEMOUNT 3051S SERIES
DPSH	520, 521, 522	BLOWERS	AIR	DIFFERENTIAL PRESSURE SWITCH	1/4" NPT, SIDE	2-20	PSI	DUAL SWITCH	INTERNAL SETPOINT ADJUSTMENT	UNITED ELECTRIC J402K SERIES
PIT	525	BLOWERS	AIR	PRESSURE TRANSMITTER	1/2" NPT, BOTTOM	0-25	PSI	4-20 mA		ROSEMOUNT 3051S SERIES
PI	621, 622	WAS/SCUM VAULT	WAS/SCUM	PRESSURE GAUGE	1/2" NPT, BOTTOM	0-100	PSI	N/A	316SS CASE, LIQUID-FILLED, PROVIDE WITH DIAPHRAGM SEAL	WIKA 233.54 SERIES
PIT	804, 954	BACKWASH PUMPS	BACKWASH	PRESSURE TRANSMITTER	1/2" NPT, BOTTOM	0-100	PSI	4-20 mA	PROVIDE WITH DIAPHRAGM SEAL	ROSEMOUNT 3051S SERIES
PIT	3002, 3102	DISC FILTERS	EFFLUENT	PRESSURE TRANSMITTER	FLUSHED FLANGE	0-100	IN H2O	4-20 mA		ROSEMOUNT 3051S SERIES
PI	1002, 2012	UV BLOWERS	AIR	PRESSURE GAUGE	1/2" NPT, BOTTOM	0-25	PSI	N/A	316SS CASE, LIQUID-FILLED	WIKA 233.54 SERIES
PI	1131	SLUDGE PUMP	SLUDGE	PRESSURE GAUGE	1/2" NPT, BOTTOM	0-50	PSI	N/A	316SS CASE, LIQUID-FILLED, PROVIDE WITH DIAPHRAGM SEAL	WIKA 233.54 SERIES
PSL	1131	SLUDGE PUMP	SLUDGE	PRESSURE SWITCH	1/4" NPT, BOTTOM	0-5	PSI	DPDT CONTACT	NEMA 4X, ADJUSTABLE TRIP SETPOINT	DWYER MERCOID 1000W SERIES
PSHH	1131	SLUDGE PUMP	SLUDGE	PRESSURE SWITCH	1/4" NPT, BOTTOM	15-20	PSI	DPDT CONTACT	NEMA 4X, ADJUSTABLE TRIP SETPOINT	DWYER MERCOID 1000W SERIES
PI	1132	SLUDGE PUMP	SLUDGE	PRESSURE GAUGE	1/2" NPT, BOTTOM	0-50	PSI	N/A	316SS CASE, LIQUID-FILLED, PROVIDE WITH DIAPHRAGM SEAL	WIKA 233.54 SERIES
PSL	1132	SLUDGE PUMP	SLUDGE	PRESSURE SWITCH	1/4" NPT, BOTTOM	0-5	PSI	DPDT CONTACT	NEMA 4X, ADJUSTABLE TRIP SETPOINT	DWYER MERCOID 1000W SERIES
PSHH	1132	SLUDGE PUMP	SLUDGE	PRESSURE SWITCH	1/4" NPT, BOTTOM	15-20	PSI	DPDT CONTACT	NEMA 4X, ADJUSTABLE TRIP SETPOINT	DWYER MERCOID 1000W SERIES
PI	1301, 1302	NPW PUMPS	NON-POTABLE WATER	PRESSURE GAUGE	1/2" NPT, BOTTOM	0-100	PSI	N/A	316SS CASE, LIQUID-FILLED, PROVIDE WITH DIAPHRAGM SEAL	WIKA 233.54 SERIES
DPSH	1305	NPW STRAINER	NON-POTABLE WATER	DIFFERENTIAL PRESSURE SWITCH	1/4" NPT, SIDE	1-5	PSI	DUAL SWITCH	INTERNAL SETPOINT ADJUSTMENT	UNITED ELECTRIC J402K SERIES
PSHH	1310	NPW HEADER	NON-POTABLE WATER	PRESSURE SWITCH	1/4" NPT, BOTTOM	10-70	PSI	DPDT CONTACT	NEMA 4X, ADJUSTABLE TRIP SETPOINT	DWYER MERCOID 1000W SERIES
PIT	1310	NPW HEADER	NON-POTABLE WATER	PRESSURE TRANSMITTER	1/2" NPT, BOTTOM	0-100	PSI	4-20 mA	PROVIDE WITH DIAPHRAGM SEAL AS A UNIT WITH PSHH-1310	ROSEMOUNT 3051S SERIES

Section 13421. Instruments
Temperature Instrument Schedule

TAG	NUMBER	LOCATION	SERVICE	TYPE	MOUNTING	RANGE	UNITS	OUTPUT	COMMENTS	MANUFACTURER/MODEL
TE	520A, 521A, 522A, 520B, 521B, 522B	BLOWERS	AIR	SPRING-LOADED, 4-LEAD RTD, SS THERMOWELL	1/4" NPT, INSERTION TYPE	-58 - 500	DEG F	N/A	SUPPLY WITH SS TRANSMITTER HEAD, Pt100 RTD	MINCO AS5140 SERIES
TIT	520A, 521A, 522A, 520B, 521B, 522B	BLOWERS	AIR	4-LEAD RTD TRANSMITTER, PROGRAMMABLE	N/A	-58 - 500	DEG F	N/A	PROVIDE WITH SENSOR ASSEMBLY	MINCO TT520 SERIES

Section 13421, Instruments
Miscellaneous Instrument Schedule

TAG	NUMBER	LOCATION	SERVICE	TYPE	ELEVATION	RANGE	UNITS	OUTPUT	COMMENTS	MANUFACTURER/MODEL
YS	110	LIFT STATION	RAW SEWAGE GASEOUS ENVIRONMENT	MAGNETIC SWITCH, HATCH CONTACT	N/A	N/A	N/A	NC CONTACT	SUPPLY WITH 30' CABLE, CLASS 1/DIV 1 RATED	PEPPERL + FUCHS
YS	111	LIFT STATION	RAW SEWAGE GASEOUS ENVIRONMENT	MAGNETIC SWITCH, HATCH CONTACT	N/A	N/A	N/A	NC CONTACT	SUPPLY WITH 30' CABLE, CLASS 1/DIV 1 RATED	PEPPERL + FUCHS
YS	112	LIFT STATION	RAW SEWAGE GASEOUS ENVIRONMENT	MAGNETIC SWITCH, HATCH CONTACT	N/A	N/A	N/A	NC CONTACT	SUPPLY WITH 30' CABLE, CLASS 1/DIV 1 RATED	PEPPERL + FUCHS

SECTION 13440

INPUT/OUTPUT LIST

PART 1 - GENERAL

1.1 SECTION INCLUDES

This section includes the requirements for the provision of the necessary hardware to monitor and control the input/output subsystem. The preliminary input/output lists are attached at the end of this section.

1.2 SUBMITTALS

Submit an input/output list, in Microsoft Office Excel format, that includes PLC panel number, card and point location, configuration information, point description, point function and tag name.

PART 2 - PRODUCTS

2.1 GENERAL

The input/output list shall contain all items to be configuration items of the point and shall be capable of being imported and exported into the system via an Excel spreadsheet.

PART 3 - EXECUTION

3.1 INPUT/OUTPUT LISTS

Refer to the attached list for input/output listing for each PLC system point.

END OF SECTION

PLC POINT LIST ANALOG INPUTS
WMARSS
Bull Hide Creek Wastewater Treatment Plant

STATION	POINT	DESCRIPTION	Tag	INSTRUMENT	LOCATION	TYPE
CP-100	AI-1	Influent Wet Well Level	LIT-100	Submersible Level Transmitter	Lift Station	AI
CP-100	AI-2	Influent Flow	FIT-104	Magnetic Flow Meter	Lift Station	AI
CP-200	AI-3	Screen Influent Level	LIT-201	Level Transmitter	Headworks	AI
CP-200	AI-4	Screen Effluent Level	LIT-201	Level Transmitter	Headworks	AI
CP-300	AI-5	Lift Station Pump 101 Speed		VFD	MCC	AI
CP-300	AI-6	Lift Station Pump 102 Speed		VFD	MCC	AI
CP-300	AI-7	Lift Station Pump 103 Speed		VFD	MCC	AI
CP-300	AI-8	Anoxic Zone DO	AIT-315	DO Transmitter	BNR	AI
CP-300	AI-9	Anoxic Zone DO	AIT-365	DO Transmitter	BNR	AI
CP-300	AI-10	Anoxic Zone ORP	AIT-316	ORP Transmitter	BNR	AI
CP-300	AI-11	Anoxic Zone ORP	AIT-366	ORP Transmitter	BNR	AI
CP-300	AI-12	Aerobic Zone 1 DO	AIT-325	DO Transmitter	BNR	AI
CP-300	AI-13	Aerobic Zone 1 DO	AIT-375	DO Transmitter	BNR	AI
CP-300	AI-14	Aerobic Zone 2 DO	AIT-335	DO Transmitter	BNR	AI
CP-300	AI-15	Aerobic Zone 2 DO	AIT-385	DO Transmitter	BNR	AI
CP-300	AI-16	Aerobic Zone 3 DO	AIT-345	DO Transmitter	BNR	AI
CP-300	AI-17	Aerobic Zone 3 DO	AIT-395	DO Transmitter	BNR	AI
CP-300	AI-18	FCV-321 Position Status		FCV-321 Actuator	BNR	AI
CP-300	AI-19	FCV-371 Position Status		FCV-371 Actuator	BNR	AI
CP-300	AI-20	FCV-331 Position Status		FCV-331 Actuator	BNR	AI
CP-300	AI-21	FCV-381 Position Status		FCV-381 Actuator	BNR	AI
CP-300	AI-22	FCV-341 Position Status		FCV-341 Actuator	BNR	AI
CP-300	AI-23	FCV-391 Position Status		FCV-391 Actuator	BNR	AI
CP-300	AI-24	FIT-327 Air Flow	FIT-327	Air Flow Transmitter	BNR	AI

CP-300	AI-25	FIT-377 Air Flow	FIT-377	Air Flow Transmitter	BNR	AI
CP-300	AI-26	FIT-337 Air Flow	FIT-337	Air Flow Transmitter	BNR	AI
CP-300	AI-27	FIT-387 Air Flow	FIT-387	Air Flow Transmitter	BNR	AI
CP-300	AI-28	FIT-347 Air Flow	FIT-347	Air Flow Transmitter	BNR	AI
CP-300	AI-29	FIT-397 Air Flow	FIT-397	Air Flow Transmitter	BNR	AI
CP-300	AI-30	BNR Effluent pH	AIT-346	pH Transmitter	BNR	AI
CP-300	AI-31	Recycle Flow	FIT-400	Flow Meter	BNR	AI
CP-300	AI-32	Recycle Pump Speed		VFD	MCC	AI
CP-300	AI-33	Alum Flow		VFD		AI
CP-300	AI-34	Alum Flow		VFD		AI
CP-300	AI-34	Hypochlorite Flow		VFD		AI
CP-300	AI-35	Hypochlorite Flow		VFD		AI
CP-600	AI-36	Scum Vault Level	LIT-620	Level Transmitter		AI
CP-600	AI-37	Clarifier A RAS Flow	FIT-700	Flow Meter		AI
CP-600	AI-38	Clarifier B RAS Flow	FIT-703	Flow Meter		AI
CP-600	AI-39	Lift Station RAS Valve Position	FCV-702	Valve Actuator		AI
CP-600	AI-40	RAS Pump P-712 Speed		VFD		AI
CP-600	AI-41	RAS Pump P-722 Speed		VFD		AI
CP-1100	AI-42	MX-1100 Speed		VFD		AI
CP-1100	AI-43	RDT-1125 Speed		VFD		AI
CP-1300	AI-44	NPW Pump P-1301 Speed		VFD		AI
CP-1300	AI-45	NPW Pump P-1302 Speed		VFD		AI
CP-1300	AI-46	NPW Pressure	PIT-1310	Pressure Transmitter		AI
CP-1300	AI-47	NPW Flow	FIT-1311	Flow Meter		AI
CP-1300	AI-48	Plant Effluent Flow	FIT-1320	Flow Meter		AI
CP-1300	AI-49	Plant Effluent DO	AIT-1312	DO Transmitter		AI
CP-1300	AI-50	Plant Effluent pH	AIT-1314	pH Transmitter		AI
CP-600	AI-51	Headworks RAS Flow	FIT-742	Flow Meter		AI
CP-600	AI-52	WAS Flow	FIT-752	Flow Meter		AI

PLC POINT LIST ANALOG OUTPUTS
WMARSS
Bull Hide Creek Wastewater Treatment Plant

STATION	POINT	DESCRIPTION	Tag	INSTRUMENT	LOCATION	TYPE
CP-300	AO-1	Lift Station Pump 101 Speed		VFD	MCC	AO
CP-300	AO-2	Lift Station Pump 102 Speed		VFD	MCC	AO
CP-300	AO-3	Lift Station Pump 103 Speed		VFD	MCC	AO
CP-300	AO-4	FCV-321 Position Command		FCV-321 Actuator	BNR	AO
CP-300	AO-5	FCV-371 Position Command		FCV-371 Actuator	BNR	AO
CP-300	AO-6	FCV-331 Position Command		FCV-331 Actuator	BNR	AO
CP-300	AO-7	FCV-381 Position Command		FCV-381 Actuator	BNR	AO
CP-300	AO-8	FCV-341 Position Command		FCV-341 Actuator	BNR	AO
CP-300	AO-9	FCV-391 Position Command		FCV-391 Actuator	BNR	AO
CP-300	AO-10	Recycle Pump Speed		VFD	MCC	AO
CP-600	AO-11	Clarifier A RAS Valve Position Command	FCV-701	Valve Actuator		AO
CP-600	AO-12	Clarifier B RAS Valve Position Command	FCV-702	Valve Actuator		AO
CP-600	AO-13	RAS Pump P-712 Speed Command		VFD		AO
CP-600	AO-14	RAS Pump P-722 Speed Command		VFD		AO
CP-1100	AO-15	MX-1100 Speed Command		VFD		AO
CP-1100	AO-16	RDT-1125 Speed Command		VFD		AO
CP-300	AO-17	CFU-1210 Speed Command		VFD		AO
CP-300	AO-18	CFU-1211 Speed Command		VFD		AO
CP-300	AO-19	CFU-1240 Speed Command		VFD		AO
CP-300	AO-20	CFU-1241 Speed Command		VFD		AO
CP-1300	AO-21	NPW Pump P-1301 Speed Command		VFD		AO
CP-1300	AO-22	NPW Pump P-1302 Speed Command		VFD		AO
CP-1300	AO-22	Effluent Sampler Flow Pacing		Sampler		AO

PLC POINT LIST DISCRETE INPUTS
WMARSS
Bull Hide Creek Wastewater Treatment Plant

STATION	POINT	DESCRIPTION	Tag	INSTRUMENT	LOCATION	TYPE
CP-100	DI-1	Influent Wet Well Low Low Level	LSLL-113	Float Switch	Lift Station	DI
CP-100	DI-2	Influent Wet Well Low Level	LSL-113	Float Switch	Lift Station	DI
CP-100	DI-3	Influent Wet Well Mid Level	LSM-113	Float Switch	Lift Station	DI
CP-100	DI-4	Influent Wet Well High Level	LSH-113	Float Switch	Lift Station	DI
CP-100	DI-5	Influent Wet Well High High Level	LSHH-113	Float Switch	Lift Station	DI
CP-100	DI-6	Lift Station Pump 101 Hatch	YS-110	Limit Switch	Lift Station	DI
CP-100	DI-7	Lift Station Pump 102 Hatch	YS-111	Limit Switch	Lift Station	DI
CP-100	DI-8	Lift Station Pump 103 Hatch	YS-112	Limit Switch	Lift Station	DI
CP-100	DI-9	Lift Station Pump 101 Remote Status	HS-101	Selector Switch	Lift Station	DI
CP-100	DI-10	Lift Station Pump 101 Start	HS-101A	Pushbutton	Lift Station	DI
CP-100	DI-11	Lift Station Pump 101 Stop	HS-101B	Pushbutton	Lift Station	DI
CP-100	DI-12	Lift Station Pump 101 High Temperature	TSH-101		Lift Station	DI
CP-100	DI-13	Lift Station Pump 101 Leak	YSH-101		Lift Station	DI
CP-100	DI-14	Lift Station Pump 102 Remote Status	HS-102	Selector Switch	Lift Station	DI
CP-100	DI-15	Lift Station Pump 102 Start	HS-102A	Pushbutton	Lift Station	DI
CP-100	DI-16	Lift Station Pump 102 Stop	HS-102B	Pushbutton	Lift Station	DI
CP-100	DI-17	Lift Station Pump 102 High Temperature	TSH-102		Lift Station	DI
CP-100	DI-18	Lift Station Pump 102 Leak	YSH-102		Lift Station	DI
CP-100	DI-19	Lift Station Pump 103 Remote Status	HS-103	Selector Switch	Lift Station	DI
CP-100	DI-20	Lift Station Pump 103 Start	HS-103A	Pushbutton	Lift Station	DI
CP-100	DI-21	Lift Station Pump 103 Stop	HS-103B	Pushbutton	Lift Station	DI
CP-100	DI-22	Lift Station Pump 103 High Temperature	TSH-103		Lift Station	DI
CP-100	DI-23	Lift Station Pump 103 Leak	YSH-103		Lift Station	DI
CP-200	DI-24	Screen Running		Starter	Headworks	DI
CP-200	DI-25	Screen Remote Status	HS-200	Selector Switch	Headworks	DI
CP-200	DI-26	Washer Compactor Running		Washer Compactor Control Panel	Headworks	DI
CP-200	DI-27	Wnsher Compactor Remote Status	HS-210	Washer Compactor Control Panel	Headworks	DI
CP-200	DI-28	Washer Compactor Emergency Stop		Washer Compactor Control Panel	Headworks	DI
CP-200	DI-29	Grit Removal Remote Status	HS-220	Grit Removal Control Panel	Headworks	DI

CP-200	DI-30	Grit Removal Mixer Running		Grit Removal Control Panel	Headworks	DI
CP-200	DI-30	Grit Pump 1 Running		Grit Removal Control Panel	Headworks	DI
CP-200	DI-31	Grit Pump 2 Running		Grit Removal Control Panel	Headworks	DI
CP-200	DI-32	Grit Removal Emergency Stop		Grit Removal Control Panel	Headworks	DI
CP-200	DI-33	Grit Removal Remote Status		Grit Removal Control Panel	Headworks	DI
CP-200	DI-34	Grit Classifier Running		Grit Classifier Control Panel	Headworks	DI
CP-200	DI-35	Grit Classifier Remote Status		Grit Classifier Control Panel	Headworks	DI
CP-200	DI-37	Grit Classifier Emergency Stop		Grit Classifier Control Panel	Headworks	DI
CP-300	DI-38	Lift Station Pump 101 Running		VFD	MCC	DI
CP-300	DI-39	Lift Station Pump 102 Running		VFD	MCC	DI
CP-300	DI-40	Lift Station Pump 103 Running		VFD	MCC	DI
CP-300	DI-41	Mixer MX-301 Remote Status	HS-301	Selector Switch	BNR	DI
CP-300	DI-42	Mixer MX-301 Running Status		MCC	BNR	DI
CP-300	DI-43	Mixer MX-351 Remote Status	HS-351	Selector Switch	BNR	DI
CP-300	DI-44	Mixer MX-351 Running Status		MCC	BNR	DI
CP-300	DI-45	Mixer MX-311 Remote Status	HS-311	Selector Switch	BNR	DI
CP-300	DI-46	Mixer MX-311 Running Status		MCC	BNR	DI
CP-300	DI-47	Mixer MX-361 Remote Status	HS-361	Selector Switch	BNR	DI
CP-300	DI-48	Mixer MX-361 Running Status		MCC	BNR	DI
CP-300	DI-49	Mixer MX-341 Remote Status	HS-341	Selector Switch	BNR	DI
CP-300	DI-50	Mixer MX-341 Running Status		MCC	BNR	DI
CP-300	DI-51	Mixer MX-391 Remote Status	HS-391	Selector Switch	BNR	DI
CP-300	DI-52	Mixer MX-391 Running Status		MCC	BNR	DI
CP-300	DI-53	FCV-321 Remote Status		FCV-321 Actuator	BNR	DI
CP-300	DI-54	FCV-321 Failure Status		FCV-321 Actuator	BNR	DI
CP-300	DI-55	FCV-371 Remote Status		FCV-371 Actuator	BNR	DI
CP-300	DI-56	FCV-371 Failure Status		FCV-371 Actuator	BNR	DI
CP-300	DI-57	FCV-331 Remote Status		FCV-331 Actuator	BNR	DI
CP-300	DI-58	FCV-331 Failure Status		FCV-331 Actuator	BNR	DI
CP-300	DI-59	FCV-381 Remote Status		FCV-381 Actuator	BNR	DI
CP-300	DI-60	FCV-381 Failure Status		FCV-381 Actuator	BNR	DI
CP-300	DI-61	FCV-341 Remote Status		FCV-341 Actuator	BNR	DI
CP-300	DI-62	FCV-341 Failure Status		FCV-341 Actuator	BNR	DI
CP-300	DI-63	FCV-391 Remote Status		FCV-391 Actuator	BNR	DI

CP-300	DI-64	FCV-391 Failure Status		FCV-391 Actuator	BNR	DI
CP-300	DI-65	Recycle Pump P-401 Remote Status	HS-401		BNR	DI
CP-300	DI-66	Recycle Pump P-401 Running		VFD	MCC	DI
CP-300	DI-67	Recycle Pump P-401 High Temperature	TSH-401		BNR	DI
CP-300	DI-68	Recycle Pump P-401 Vibration Alarm	VSH-401		BNR	DI
CP-600	DI-69	Clarifier A Running			CP-601	DI
CP-600	DI-70	Clarifier A Remote Status	HS-601		CP-601	DI
CP-600	DI-71	Clarifier A High Torque	OSH-601		CP-601	DI
CP-600	DI-72	Clarifier B Running			CP-611	DI
CP-600	DI-73	Clarifier B Remote Status	HS-611		CP-611	DI
CP-600	DI-74	Clarifier B High Torque	OSH-611		CP-611	DI
CP-600	DI-75	Scum Pump P-621 Remote Status	HS-621		CP-621	DI
CP-600	DI-76	Scum Pump P-621 Running			CP-621	DI
CP-600	DI-77	Scum Pump P-622 Remote Status	HS-622		CP-621	DI
CP-600	DI-78	Scum Pump P-622 Running			CP-621	DI
CP-600	DI-79	RAS Pump P-712 Remote Status	HS-712			DI
CP-600	DI-80	RAS Pump P-712 Running		VFD		DI
CP-600	DI-81	RAS Pump P-721 High Temperature	TSH-712			DI
CP-600	DI-82	RAS Pump P-722 Remote Status	HS-722			DI

CP-600	DI-83	RAS Pump P-722 Running		VFD		DI
CP-600	DI-84	RAS Pump P-722 High Temperature	TSH-722			DI
CP-600	DI-85	RAS Pump P-712 Inlet Valve Opened	ZSH-711			DI
CP-600	DI-86	RAS Pump P-712 Inlet Valve Closed	ZSL-711			DI
CP-600	DI-87	RAS Pump P-712 Outlet Valve Opened	ZSH-713			DI
CP-600	DI-88	RAS Pump P-712 Outlet Valve Closed	ZSL-713			DI
CP-600	DI-89	RAS Pump P-722 Inlet Valve Opened	ZSH-721			DI
CP-600	DI-90	RAS Pump P-722 Inlet Valve Closed	ZSL-721			DI
CP-600	DI-91	RAS Pump P-722 Outlet Valve Opened	ZSH-723			DI
CP-600	DI-92	RAS Pump P-722 Outlet Valve Closed	ZSL-723			DI
CP-600	DI-93	WAS Valve Opened	FCV-751			DI
CP-600	DI-94	WAS Valve Closed	FCV-751			DI
CP-1100	DI-95	MX-1100 Running				DI
CP-1100	DI-96	MX-1100 Remote Status				DI
CP-1100	DI-97	RDT-1125 Running				DI
CP-1100	DI-98	RDT-1125 Remote Status				DI
CP-300	DI-99	CFU-1210 Running				DI
CP-300	DI-100	CFU-1210 Remote Status				DI
CP-300	DI-101	CFU-1211 Running				DI
CP-300	DI-102	CFU-1211 Remote Status				DI
CP-300	DI-103	CFU-1240 Running				DI
CP-300	DI-104	CFU-1240 Remote Status				DI
CP-300	DI-105	CFU-1241 Running				DI
CP-300	DI-106	CFU-1241 Remote Status				DI
CP-1300	DI-107	Wet Well Low Low Level	LSLL-1300	Float Switch		DI
CP-1300	DI-108	NPW Pump P-1301 Running		VFD		DI
CP-1300	DI-109	NPW Pump P-1301 Remote Status	HS-1301			DI
CP-1300	DI-110	NPW Pump P-1302 Running		VFD		DI
CP-1300	DI-111	NPW Pump P-1302 Remote Status	HS-1302			DI
CP-1300	DI-112	NPW High High Pressure	PSHH-11310	Pressure Switch		DI

PLC POINT LIST DISCRETE OUTPUTS
WMARSS
Bull Hide Creek
Wastewater Treatment
Plant

STATION	POINT	DESCRIPTION	Tag	INSTRUMENT	LOCATION	TYPE
CP-200	DO-1	Screen Wash Solenoid	FCV-201		Headworks	DO
CP-200	DO-2	Washer Compactor Run Command	CW-210		Headworks	DO
CP-200	DO-3	Grit Pump P-220 Run Command	P-220	Grit Removal Control Panel	Headworks	DO
CP-200	DO-4	Grit Pump P-221 Run Command	P-221	Grit Removal Control Panel	Headworks	DO
CP-200	DO-5	Grit Removal Run Command		Grit Removal Control Panel	Headworks	DO
CP-200	DO-6	Grit Classifier Run Command	GC-225	Grit Classifier Control Panel	Headworks	DO
CP-300	DO-7	Lift Station Pump 101 Run Command		VFD	MCC	DO
CP-300	DO-8	Lift Station Pump 102 Run Command		VFD	MCC	DO
CP-300	DO-9	Lift Station Pump 103 Run Command		VFD	MCC	DO
CP-300	DO-10	Screen Run Command	MFS-200		MCC	DO
CP-300	DO-11	Recycle Pump P-401 Run Command		VFD	MCC	DO
CP-300	DO-12	Recycle Pump P-401 Oil Solenoid Valve	FCV-401			DO
CP-600	DO-13	Clarifier A Run Command			CP-601	DO
CP-600	DO-14	Clarifier B Run Command			CP-611	DO
CP-600	DO-15	Scum Pump P-621 Run Command			CP-621	
CP-600	DO-16	Scum Pump P-622 Run Command			CP-621	
CP-600	DO-17	RAS Pump P-712 Run Command		VFD		DO
CP-600	DO-18	RAS Pump P-722 Run Command		VFD		DO
CP-600	DO-19	WAS Valve FCV751 Open Command	FCV751	FCV751 Actuator		DO
CP-600	DO-20	WAS Valve FCV751 Close Command	FCV751	FCV751 Actuator		DO
CP-600	DO-21	WAS Valve FCV751 Stop Command	FCV751	FCV751 Actuator		DO
CP-1100	DO-22	MX-1100 Run Command				DO
CP-1100	DO-23	RDT-1125 Run Command				DO
CP-300	DO-24	CFU-1210 Run Command				DO
CP-300	DO-25	CFU-1211 Run Command				DO
CP-300	DO-26	CFU-1240 Run Command				DO
CP-300	DO-27	CFU-1241 Run Command				DO
CP-1300	DO-28	NPW Pump P-1301 Run Command		VFD		DO
CP-1300	DO-29	NPW Pump P-1302 Run Command		VFD		DO