



Scope of Supply





I. KRUGER INC.
SCOPE OF SUPPLY
FOR THE
CBJ Biosolids Belt Dryer System

LOCATED IN
City/Borough of Juneau, AK

City/Borough of Juneau Engineering Department

C(3) RFP E15-263

Kruger Project No.: 5700102402

BID DATE:

June 17, 2015



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Attachments:

- Sample Insurance Certificate



SECTION 1
Pricing and Schedule



1. PRICING AND SCHEDULE

1.1 DESCRIPTION OF WORK

I. Kruger Inc. (Kruger), an equipment supplier, proposes and agrees to furnish all labor services, materials, equipment, and all other items and facilities necessary to supply and deliver the equipment items as specified in this Scope of Supply and further detailed within Kruger's Bid Submittal.

1.2 PROPOSAL PRICE

Price includes the BioCon system and dried sludge handling equipment as detailed herein. The price excludes sales and/or use taxes. Buyer agrees to provide the necessary tax-exempt certification or Reseller documentation for sales taxes exemption within thirty (30) days after receipt of a purchase agreement executed by all parties. Furthermore, Buyer accepts responsibility for all applicable state and local sales taxes as Supplier is not registered to collect or remit AK sales and/or use taxes.

Kruger shall furnish and deliver (FOB Jobsite) Equipment, including submittals, start-up and other services, in conformance to the requirements set forth in this document for the Lump Sum price of:

Refer to APPENDIX B - COST PROPOSAL

The price is valid for 180 days from the date of this Proposal. After 180 days from the date of this proposal, the price provided by Kruger is subject to adjustment. Refer to Section 13 for more information.

1.3 BONDS

Pricing includes a Performance bond equal to 100% of contract value.

1.4 WARRANTY

Kruger shall provide a one year warranty as detailed within Kruger's Standard Terms of Sale (Section 2 herein).

1.5 DELIVERY SCHEDULE

The following equipment delivery schedule is based on current availability of materials. This equipment delivery schedule shall be mutually agreed upon with the Installation Contractor.

Deliverables	Estimated Delivery of Equipment to Job Site
Submittals / Shop Drawings	10 – 12 weeks
Delivery of BioCon Dryer Cabinet	38 – 42 weeks**
Delivery of Wet Sludge Hopper	10 – 14 weeks**
Delivery of all other Mechanical Equipment	10 – 16 weeks**



- IF VEOLIA IS ABLE TO SHIP EQUIPMENT SOONER THAN THE ABOVE SCHEDULE, CONTRACTOR MUST ACCEPT DELIVERIES AND PROVIDE ADEQUATE STORAGE ON-SITE FOR SUCH EQUIPMENT.
 - Installation Manuals will be furnished upon delivery of equipment.
 - Operation and Maintenance Manuals will be submitted within 90 days after receipt of approved shop drawings.
- ** AFTER RECEIPT OF APPROVED SUBMITTAL DRAWINGS AND RELEASE TO MANUFACTURER.

1.6 THIS PROPOSAL IS RESPECTFULLY SUBMITTED BY

	Veolia Contact	Representative
Name	Jim Georger	Bill Reilly
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SECTION 2

Kruger Inc. Standard Terms of Sale



2. I. KRUGER INC. - STANDARD TERMS OF SALE

1. Applicable Terms. These terms govern the purchase and sale of the equipment and related services, if any (collectively, "Equipment"), referred to in Seller's purchase order, quotation, proposal or acknowledgment, as the case may be ("Seller's Documentation"). Whether these terms are included in an offer or an acceptance by Seller, such offer or acceptance is conditioned on Buyer's assent to these terms. Seller rejects all additional or different terms in any of Buyer's forms or documents.
2. Payment. Buyer shall pay Seller the full purchase price as set forth in Seller's Documentation. Unless Seller's Documentation provides otherwise, freight, storage, insurance and all taxes, duties or other governmental charges relating to the Equipment shall be paid by Buyer. If Seller is required to pay any such charges, Buyer shall immediately reimburse Seller. All payments are due within 30 days after receipt of invoice. Buyer shall be charged the lower of 1 ½% interest per month or the maximum legal rate on all amounts not received by the due date and shall pay all of Seller's reasonable costs (including attorneys' fees) of collecting amounts due but unpaid. All orders are subject to credit approval.
3. Delivery. Delivery of the Equipment shall be in material compliance with the schedule in Seller's Documentation. Unless Seller's Documentation provides otherwise, Delivery terms are F.O.B. Jobsite.
4. Ownership of Materials. All devices, designs (including drawings, plans and specifications), estimates, prices, notes, electronic data and other documents or information prepared or disclosed by Seller, and all related intellectual property rights, shall remain Seller's property. Seller grants Buyer a non-exclusive, non-transferable license to use any such material solely for Buyer's use of the Equipment. Buyer shall not disclose any such material to third parties without Seller's prior written consent.
5. Changes. Seller shall not implement any changes in the scope of work described in Seller's Documentation unless Buyer and Seller agree in writing to the details of the change and any resulting price, schedule or other contractual modifications. This includes any changes necessitated by a change in applicable law occurring after the effective date of any contract including these terms.
6. Warranty. Subject to the following sentence, Seller warrants to Buyer that the Equipment shall materially conform to the description in Seller's Documentation and shall be free from defects in material and workmanship. The foregoing warranty shall not apply to any Equipment that is specified or otherwise demanded by Buyer and is not manufactured or selected by Seller, as to which (i) Seller hereby assigns to Buyer, to the extent assignable, any warranties made to Seller and (ii) Seller shall have no other liability to Buyer under warranty, tort or any other legal theory. If Buyer gives Seller prompt written notice of breach of this warranty within 18 months from delivery or 1 year from beneficial use, whichever occurs first (the "Warranty Period"), Seller shall, at its sole option and as Buyer's sole remedy, repair or replace the subject parts or refund the purchase price therefore. If Seller determines that any claimed breach is not, in fact, covered by this warranty, Buyer shall pay Seller its then customary charges for any repair or replacement made by Seller. Seller's warranty is conditioned on Buyer's (a) operating and maintaining the Equipment in accordance with Seller's instructions, (b) not making any unauthorized repairs or alterations, and (c) not being in default of any payment obligation to Seller. Seller's warranty does not cover damage caused by chemical action or abrasive material, misuse or improper installation (unless installed by Seller). THE WARRANTIES SET FORTH IN THIS SECTION ARE SELLER'S SOLE AND EXCLUSIVE WARRANTIES AND ARE SUBJECT TO SECTION 10 BELOW. SELLER MAKES NO OTHER WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR PURPOSE.
7. Indemnity. Seller shall indemnify, defend and hold Buyer harmless from any claim, cause of action or liability incurred by Buyer as a result of third party claims for personal injury, death or damage to tangible property, to the extent caused by Seller's negligence. Seller shall have the sole authority to direct the defense of and settle any indemnified claim. Seller's indemnification is conditioned on Buyer (a) promptly, within the Warranty Period, notifying Seller of any claim, and (b) providing reasonable cooperation in the defense of any claim.
8. Force Majeure. Neither Seller nor Buyer shall have any liability for any breach (except for breach of payment obligations) caused by extreme weather or other act of God, strike or other labor shortage or disturbance, fire, accident, war or civil disturbance, delay of carriers, failure of normal sources of supply, act of government or any other cause beyond such party's reasonable control.
9. Cancellation. If Buyer cancels or suspends its order for any reason other than Seller's breach, Buyer shall promptly pay Seller for work performed prior to cancellation or suspension and any other direct costs incurred by Seller as a result of such cancellation or suspension.
10. LIMITATION OF LIABILITY. NOTWITHSTANDING ANYTHING ELSE TO THE CONTRARY, SELLER SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, SPECIAL, PUNITIVE OR OTHER INDIRECT DAMAGES, AND SELLER'S TOTAL LIABILITY ARISING AT ANY TIME FROM THE SALE OR USE OF THE EQUIPMENT SHALL NOT EXCEED THE PURCHASE PRICE PAID FOR THE EQUIPMENT. THESE LIMITATIONS APPLY WHETHER THE LIABILITY IS BASED ON CONTRACT, TORT, STRICT LIABILITY OR ANY OTHER THEORY.
11. Miscellaneous. If these terms are issued in connection with a government contract, they shall be deemed to include those federal acquisition regulations that are required by law to be included. These terms, together with any quotation, purchase order or acknowledgement issued or signed by the Seller, comprise the complete and exclusive statement of the agreement between the parties (the "Agreement") and supersede any terms contained in Buyer's documents, unless separately signed by Seller. No part of the Agreement may be changed or cancelled except by a written document signed by Seller and Buyer. No course of dealing or performance, usage of trade or failure to enforce any term shall be used to modify the Agreement. If any of these terms is unenforceable, such term shall be limited only to the extent necessary to make it enforceable, and all other terms shall remain in full force and effect. Buyer may not assign or permit any other transfer of the Agreement without Seller's prior written consent. The Agreement shall be governed by the laws of the State of North Carolina without regard to its conflict of laws provisions.



SECTION 3

Design Summary and Performance Guarantee



3.1 DESIGN SUMMARY

The BioCon equipment is designed per the following design summary as part of our base bid:

Table 1: BioCon Dryer Design Data – Base Bid

Design Parameter	Value System Total (Per Unit)
Load-dry solids	1,685 ton/yr
Dry solids in sludge cake	14% ¹
Load – sludge cake	12,034 ton/yr
Number of Trains	1
Drying plant, evaporative load	6,540 lb/hr
Drying plant, sludge cake capacity	7,714 wet lb/hr
Operation time	3,120 hr / yr ²
Dry solids in dried sludge	92%
Dried sludge @ 92%	1,174 ton product/year
Fuel consumption	9.551 MMBTU/hr
WWTP effluent consumption at 59°F / 77°F ³	180 gpm / 229 gpm

¹ Assumes that the wet sludge is form stable.

² Based on operating 10 hours per day, 6 days per week, 52 weeks per year.

³ Plant effluent; does not need to be potable.

3.2 PERFORMANCE GUARANTEE

Kruger shall be responsible for the process performance of the BioCon Thermal Dryer process and shall guarantee dryer performance, inclusive of providing a 100% Performance Bond. Kruger's dryer is based upon the design criteria noted above in Table 1 and in coordination with the RFP. The BioCon dryer is capable of performing within the range noted within the RFP (10-17%DS), providing the wet sludge is form stable. Kruger has BioCon installations operating at these incoming %DS. In order to ensure satisfactory drying of the sludge within the BioCon, the % range of the incoming sludge should be narrowed, typically within a 2% range. Kruger shall work with the City review the plant's operations and develop a mutually acceptable process performance guarantee.



SECTION 4

BioCon Belt Dryer Equipment Scope of Supply



4.0 GENERAL

Kruger will provide the equipment and field services as described herein.

Kruger will supply the following equipment as described below:

- a. Wet Cake Storage Hopper
- b. Main Feed Pumps
- c. Dosing Pumps
- d. Thermal Belt Dryer
- e. Platform Assemblies
- f. Thermal Fluid Heating System
- g. Condenser
- h. Drying Air Treatment Fan
- i. Vacuum Fan
- j. Rotary Airlock
- k. Transfer Conveyor
- l. Distribution Screw
- m. End Product Bagging Station
- n. Valves
- o. Instrumentation and Controls
- p. Motor Control Center

A **sludge bypass system** has been designed as part of the piping between the main sludge pump and the dryer unit. This will be controlled by an automated two way valve, which will be installed by the contractor when the piping is installed. See the attached drawings in Section 5 of this proposal for more details.

The BioCon System does not require a fugitive dust control system. Any particulates that fall through the belt on the dryer are collected in collection areas in the bottom of the dryer cabinet. The bag station does not require dust control. We have two other US installations with bagging stations and they operate safely and cleanly without dust control.

See the equipment cut sheets for each piece of equipment as detailed in Section 7 of this proposal package.

ASSUMPTIONS

Kruger has made the following assumption in designing the BioCon System. Please notify Kruger of any deviations to these assumptions.

- The screening facilities at the headworks for all three WWTPs in Juneau are 6-8 mm or better. Nozzles will plug more frequently if the screening is not to these standards. Nozzles are available in 5.1, 6.5, and 7.1 mm; Kruger shall work with Juneau to provide the appropriate nozzle size.
- The cooling water to the condenser meets the following requirements: less than 20 mg/L TSS, less than 18 grains/gallon water hardness, and less than 10 ppm heavy metal content.
- Length of conveyor between dryer extraction screw and bag station distribution screw is 60 ft.
- Length of distribution conveyor that will deliver product to the bags is 32 ft.



- A four (4) bag station will be an adequate way (capacity) to handle the amount of solids expected. A larger bagging station will reduce the frequency that bags would need to be changed out, although the proposed four (4) bag system is adequate. A silo would also be a suitable option with this size plant. If this is desired, Kruger can supply this feature.

SCOPE OF SUPPLY

4.1 PROCESS AND MECHANICAL EQUIPMENT

Please note the equipment manufacturers listed below are based upon Kruger’s current review of their offerings and our past experience. ‘Or equal’ equipment manufacturers may be reviewed and mutually agreed upon with Juneau during final design.

Process and Mechanical Equipment Items	Qty	Description
Wet Sludge Storage Hopper	1	<p>The bin has a capacity of 95 yd³, 75 yd³ of usable capacity.</p> <ul style="list-style-type: none"> • Each hopper shall be manufactured with: <ul style="list-style-type: none"> ○ Wetted parts, 1/4" plate painted A36 steel. ○ Hopper top: with inlet, odor control port, hatch, aluminum OSHA handrails with toe kicks, ○ OSHA ladder with cage ○ Hopper side: complete with manway on vertical wall (not shown). ○ Four (4) Discharge points with manual Slide gates ○ Twin (2) live bottom 16" diameter shafted screws, 3 Hp inverter duty motor, NORD 5282 Reducer. ○ Hopper will be shipped and delivered in (2) sections. • The wet sludge storage hopper shall be delivered to job site individually. Contractor is responsible for connecting any wiring and piping to hopper.



Process and Mechanical Equipment Items	Qty	Description
Main Feed Pump	4	<p>The Feed Pump will be used to convey sludge from the wet cake sludge storage bin to the dosing pumps on the BioCon sludge drying system.</p> <ul style="list-style-type: none"> • Four (4) Main Feed Pumps, detailed as: <ul style="list-style-type: none"> ○ Number of Pumps: 4 (2 duty + 2 standby) ○ Flow-rate (gpm): 6 – 10 ○ Sludge Percent Dry Solids (%): 14 ○ Design Discharge Pressure (psig) : 348 ○ Design Sludge Temperature (deg F): 32 to 113 ○ Maximum Pump Speed (rpm): 49 - 81 ○ Motor Horsepower (HP): 7.5 ○ Maximum Motor Speed (rpm): 890 – 1,397 ○ Pump Make and Model: Seepex BTE 10-24 ○ Connections: 3” ANSI flange ○ Control box and temperature probes for dry run protection • The pumping units are self-priming progressing cavity type specifically designed for pumping wastewater treatment sludge in liquid or slurry form containing organic solids and small inorganic particles. • Material components: <ul style="list-style-type: none"> ○ Rotor – 1.0503 (C45) / 576 – 1045 with ductile chromium coating ○ Stator – NBR Perbunan ○ Pump body Cast iron ○ Shaft Seal – SiC solid, FPM, and 316 TI SS ○ Plug-in Shaft – 420 SS • Spare Parts Included: <ul style="list-style-type: none"> ○ One (1) spare rotor ○ One (1) Spare Stator NBR chamfer ○ One (1) mechanical seal ○ One (1) set of joint parts • The feed pumps shall be delivered to job site as four (4) separate items and installed by the Contractor. Connections to the hopper and dosing manifold (piping) shall be done by Contractor. Contractor is responsible for connecting wiring and piping to the dosing pumps (upper platform).



Process and Mechanical Equipment Items	Qty	Description
Dosing Pump	8	<p>The Dosing Pumps will be used to convey sludge to the depositors. These pumps will be used to convey equal and consistent sludge amounts to the sludge drying belts on the BioCon dryer.</p> <ul style="list-style-type: none"> • Eight (8) Dosing Pumps, detailed as: <ul style="list-style-type: none"> ○ Number of Pumps: 8 (4 duty + 4 standby) ○ Flow-rate (gpm): 1.5 – 2.2 ○ Sludge Percent Dry Solids (%): 15 ○ Design Discharge Pressure (psig) : 348 ○ Design Sludge Temperature (deg F): 32 – 113 ○ Maximum Pump Speed (rpm): 48 – 71 ○ Motor Horsepower (HP): 2 ○ Maximum Motor Speed (rpm): 1,140 – 1,686 ○ Pump Make and Model: Seepex BN 2-24 ○ Control box & temperature probes for dry run protection • The pumping units are self-priming, progressing cavity type specifically designed for pumping wastewater treatment sludge in liquid or slurry form containing organic solids and small inorganic particles. • Material components: <ul style="list-style-type: none"> ○ Rotor – 316 TI SS – 1045 with ductile chromium coating ○ Stator – NBR Perbunan ○ Pump body Cast iron ○ Shaft Casing – 316SS ○ Shaft Seal – SiC solid, FPM, and 316SS ○ Plug-in Shaft – 316 SS • Spare Parts Included: <ul style="list-style-type: none"> ○ One (1) spare rotor ○ One (1) Spare Stator NBR chamfer ○ One (1) mechanical seal ○ One (1) set of joint parts • The feed pumps shall be mounted on the upper platform assembly and will be delivered to job site with the platform. This will include local termination box, interconnecting piping and wiring. Contractor is responsible for connecting wiring and piping to platform.



Process and Mechanical Equipment Items	Qty	Description
Thermal Belt Dryer	1	<p>BioCon is a belt dryer that deposits sludge onto one of two belts and heats the sludge to remove moisture. The dryer works with two belts to convey the sludge through a warm zone then a cool zone before it exits the dryer. The BioCon thermal dryer is designed to operate at 350-375 °F and heats the air indirectly with a thermal fluid system.</p> <p>The following equipment is included as part of Kruger's dryer cabinet:</p> <ul style="list-style-type: none"> • One (1) model SD8318-IO reinforced, 304 stainless steel BioCon Dryer, inclusive of: <ul style="list-style-type: none"> ○ Eight (8) sludge depositor stations, inclusive of twenty-four (24) manual three-way valves, twenty-four (24) flexible depositor hoses with quick connects, two (2) depositor manifolds, eight (8) flush valves, four (4) sludge relieving valves, four (4) solenoid water cleaning valves, and one (1) depositor motor and gearbox ○ galvanized steel support legs ○ Two (2) 304 SS drying belts inclusive of drums and inverter duty motors ○ One (1) sprinkler system inclusive of two (2) 1-1/4 inch solenoid valves and one (1) 2-inch pressure reducing valve ○ Four (4) internal drying air circulation fans; inclusive of inverter duty motor ○ Two (2) internal air to thermal fluid heat exchangers ○ One (1) discharge screw conveyor, 304SS, inclusive of motor and gearbox with multiple temperature sensor mounting points for Class A confirmation ○ Inspection Hatches, mounted on side of dryer to inspect product drying on belt. ○ One (1) stainless steel nozzle cleaning system; each inclusive of two (2) ½-inch manual ball valves and one (1) 1-inch manual ball valve ○ Dryer will be delivered without insulation. Insulation and cladding will be installed onsite. • Platform and Galleries <ul style="list-style-type: none"> ○ One (1) painted carbon steel upper platform with handrail and grating ○ One (1) perimeter platform around the mid section of the dryer unit. Circumvents entire dryer unit ○ Stairs with handrail to connect each platform • Scope of work by others <ul style="list-style-type: none"> ○ Exterior ductwork to connect to ancillary equipment will be in the scope of the General Contractor. ○ Interconnecting piping to connect condenser, thermal oil skid, etc is to be done by others. Insulation and cladding of thermal oil piping is to be done by others. • The dryer will be manufactured in a fabrication shop and shipped to Juneau. The dryer cabinet will be shipped as one piece. • Spare Parts <ul style="list-style-type: none"> ○ Depositor Nozzles (set of 100)



Process and Mechanical Equipment Items	Qty	Description
BioCon Platform Assemblies	2	<p>Kruger shall supply two levels of platforms around the BioCon dryer unit, consisting of an upper and lower platform. Kruger will have these modular platforms fabricated to include frames, decking, rails, and piping associated with the dosing pumps, valves, and depositors along with a UL Type 4X junction box and local motor disconnects. Stairs from the floor will lead to the lower platform. Stairs from the lower platform will lead to the upper platform. See drawings and P&ID's for details (Section 5 of this proposal package).</p> <p>The following platform shall be included as part of Kruger's Scope:</p> <ul style="list-style-type: none"> • Upper Platform <ul style="list-style-type: none"> ○ Upper Platform Approximately 30' W x 19' L x 20' H. ○ Main frame is quoted as W10 x 30, will be painted (2) coats epoxy gray ○ Sub-frame is quoted as C8 x 13.75, will be painted (2) coats epoxy gray ○ Frame will be shipped in (2) sections. Deck will be sloped to one drain. ○ Decking will be diamond plate and seal welded will be painted (2) coats epoxy gray ○ Decking will be stitch welded to main frame cleaned and painted ○ Hand rails will be sch. 40 pipe and painted yellow ○ (1) set of stairs is included to connect to the lower platform, shipped in (1) section ○ Treads will be galvanized bar grating with bullnose ○ Legs for the upper platform are quoted as W6 x 9 and will be connect to lower platform when feasible, legs will be galvanized. Shipped in (1) section ○ Legs will have pads to be bolted to the main frame for re-assembly ○ Angle braces will be supplied as needed and are quoted as 3 x 3 Angle ○ Depositor wash down station is included ○ Local disconnects will be provided for every skid-mounted motor ○ (1) Junction Box Enclosure for termination of control signals ○ Utility Piping (for Pumps and Depositors only) <ul style="list-style-type: none"> ▪ 304SS Sch. 10 pipe sized per the P&ID ▪ Piping that is included is on the upper platform and shown on P&ID ▪ Connections are Flanged and threaded ▪ Fittings will be butt welded, socket weld, and threaded ▪ Hangers and supports as needed • Lower Platform <ul style="list-style-type: none"> ○ Lower Platform Approximately 30' W x 80' L x 10' H. (4' around outside of Dryer) ○ Main frame is quoted as C6 x 8.2, will be painted (2) coats epoxy gray ○ Sub-frame is quoted as C4 x 5.4, will be painted (2) coats epoxy gray ○ Frame will be shipped in (6) sections. ○ Decking will be galvanized bar grating ○ Decking will sit into main frame and sit on the sub frame for a flat top finish ○ Hand rails will be sch. 40 pipe and painted yellow ○ (1) set of stairs is included to go to the floor, shipped in (1) section ○ Treads will be galvanized bar grating with bullnose ○ Legs for the lower platform are quoted as W4 x 13, legs will be galvanized. Shipped in (1) section ○ Legs will have pads to be bolted to the main frame for re-assembly ○ Angle braces will be supplied as needed and are quoted as 3 x 3 Angle • Frame shall be Carbon Steel Square I-Beam, C-Channel, and Angle sized as needed • All Skid Frame welds will be cleaned and prepped for paint or galvanizing • Welds will be consistent and crevice free • All legs will have mounting pads at the floor ½" thick plates • Pump plates and mounting plates will be mill finish. • Scope of work by others <ul style="list-style-type: none"> ○ Assembly of platforms in the field. Platforms, stairs, and legs will be shipped in 12 sections and any reconnection points will be labeled. ○ Piping between the main feed pumps and the upper gallery are by others. See the Drawings and P&ID's in Section 5 of this proposal package for details.



Process and Mechanical Equipment Items	Qty	Description
Thermal Fluid Heating System	1	<p>The thermal fluid heating system will be used to heat thermal fluid to be used to heat the BioCon dryer. This thermal fluid system will be on a standalone skid and the heated thermal fluid will be pumped to the dryer cabinet. This configuration makes the dryer an indirect heater.</p> <p>Thermal Fluid will be circulated by centrifugal pump to the warm zone and end zone heat exchangers in the Biocon. Two 3-way valves will modulate and distribute the correct flow to each zone of the dryer by temperature setpoints.</p> <p>The following equipment is included as part of Kruger's Thermal Fluid Heating System:</p> <ul style="list-style-type: none"> • One (1) thermal fluid heater, detailed as: <ul style="list-style-type: none"> ○ Manufacturer: Fulton ○ Model: FT-1000-C ○ Fuel source: #2 Fuel Oil ○ Output: 10,000,000 BTU/hr ○ NEMA 4x Control Panel • Two (2) centrifugal pumps (1 duty, 1 installed standby) for circulation of thermal fluid, detailed as: <ul style="list-style-type: none"> ○ Manufacturer: Dean Centrifugal Pump ○ Flow Rate: 615 gpm @ 55 psi ○ Motor: 50 HP, 460V / 3ph / 60 Hz, 3600 RPM, TEFC with motor starter. • One (1) centrifugal pump for circulation of thermal fluid in end zone, detailed as: <ul style="list-style-type: none"> ○ Manufacturer: Dean Centrifugal Pump ○ Flow Rate: 86 gpm @ 55 psi ○ Motor: 15 HP, 460V / 3ph / 60 Hz, 3600 RPM, TEFC with motor starter. • One (1) deaerator cold-seal expansion tank, detailed as: <ul style="list-style-type: none"> ○ Capacity: 444 gallons, suitable for maximum total system fluid content of 1,700 gallons ○ Includes Liquid Level Switch • Two (2) three way valves for thermal fluid flow control, controlled by local control in conjunction with temperature sensors. • One (1) stack temperature switch (stack by CONTRACTOR) • One (1) Nitrogen Blanket kit, inclusive of a loose safety relief valve, a loose spool piece with a 2" bubble tight ball valve, and a loose, assembled N2 kit: 2-way nitrogen • NFPA 85 rated fuel train • Fourteen (14) 55 gallon barrels of Paratherm HE thermal fluid for start-up • Regulator, 2-way nitrogen back pressure regulator, check valve, and pressure gauge • The system will be skid mounted, but will be shipped to site in (4) pieces. • The system will be delivered without insulation. Insulation and cladding will be installed onsite after assembly (by others). • Scope of work by others <ul style="list-style-type: none"> ○ Catch tank to be piped in the field ○ Interconnecting piping to connect the thermal oil skid to the BioCon ○ Insulation and cladding of thermal oil interconnecting piping ○ Connection to Fuel Oil, wiring, etc. is to be done by contractor. ○ Assembly of the thermal Fluid Heating System components (arrives in 4 pieces and any reconnection points labeled.)



Process and Mechanical Equipment Items	Qty	Description
Condenser	1	<p>Kruger shall supply a condenser that will be installed separate from the dryer cabinet. The Condenser will be used to remove humidity from the dryer air. This unit will be connected through ductwork (by others).</p> <p>The following equipment shall be included:</p> <ul style="list-style-type: none"> • One (1) Vertical Condenser/Scrubber <ul style="list-style-type: none"> ○ Model VVS-60-SST-10.7-96-B ○ Stainless Steel Construction ○ Packed Bed includes 8' of media and a mist eliminator ○ Upper and Lower Site Glasses ○ Access Door and Hatch ○ Four (4) differential pressure taps. ○ 2 levels of spray nozzles for main packed area ○ 2 levels of spray nozzles for mist eliminator section • Manufacturer: Viron® International Corporation. • The condenser will be delivered without insulation. Insulation and cladding will be installed onsite. • Scope of work by others <ul style="list-style-type: none"> ○ Interconnecting piping and ductwork to connect to drain, water, and dryer unit
Drying Air Treatment Fan	1	<p>A drying air treatment fan will be supplied to pull air through the condenser unit and return the air to the BioCon dryer.</p> <p>The following equipment shall be included:</p> <ul style="list-style-type: none"> • One (1) Belt driven RBA fan <ul style="list-style-type: none"> ○ Model: RBA 919 ○ Volumetric Flow: 7,155 cfm ○ Installed Power: 20 HP ○ Operational Power: 16.30 BHP ○ Motor: 460V / 3ph / 60 Hz, 1,800 RPM <p>Includes :</p> <ul style="list-style-type: none"> • Bolted access door • ¾" drain • Vibration Isolators – Spring Rails • Scope of work by others <ul style="list-style-type: none"> ○ Interconnecting ductwork and wiring to connect dryer unit ○ Insulation and cladding of ductwork



Process and Mechanical Equipment Items	Qty	Description
Vacuum Fan	1	<p>A vacuum fan will be supplied to pull air from the air recirculation loop. This will serve the purpose of keeping negative pressure on the BioCon dryer, to eliminate odor coming from the dryer cabinet.</p> <p>The following equipment shall be included:</p> <ul style="list-style-type: none"> • One (1) Belt driven RBA fan <ul style="list-style-type: none"> ○ Model: RBA 909 ○ Volumetric Flow: 1,291 cfm ○ Installed Power: 3 HP ○ Operational Power: 2.41 BHP ○ Motor: 460V / 3ph / 60 Hz, 1,800 RPM <p>Includes :</p> <ul style="list-style-type: none"> • Bolted access door • ¾" drain • Vibration Isolators – Spring Rails • Scope of work by others <ul style="list-style-type: none"> ○ Interconnecting ductwork and wiring to connect dryer unit ○ Insulation and cladding of ductwork
Rotary Airlock	1	<p>A rotary airlock will be supplied to isolate the heated air in the dryer from the outside environment at the dryer extraction screw.</p> <p>The rotary airlock is detailed as follows:</p> <ul style="list-style-type: none"> • One (1) 10 x 10, 0.40 C.F.R Rotary Airlock Valve <ul style="list-style-type: none"> ○ Inlet and Outlet connections: 10" square flange ○ Cast Iron housing and endplates ○ Outboard bearings ○ 8-vane open end mild steel rotor assembly ○ Fixed edge mild steel rotor tips – beveled ○ Inlet flat style shear protector, mild steel construction ○ One (1) Drive Assembly: 1HP, TEFC enclosure, 460V / 3ph / 60 Hz, c-face Class II, Div II Group F motor, SEW reducer, shear pin sprocket, chain drive, drive guard, and motor mount base, completely factory assembled. Final drive RPM is 20.
Transfer Conveyor	1	<p>A conveyor will be supplied to transfer sludge from the extraction screw (dried end product) to the distribution screw at the bagging station.</p> <p>The transfer conveyor is detailed as follows:</p> <ul style="list-style-type: none"> • One (1) 9" diameter x 60' long screw conveyor <ul style="list-style-type: none"> ○ One (1) U-trough with cover ○ One (1) 10" square flange transition chute ○ One (1) Over-Flow Door with rotary hinge actuated Limit Switch ○ One (1) Helicoid Screw, 59' long ○ Four (4) Screw Hangers with auto-lubricators ○ One (1) 2HP, 26 RPM screw conveyor drive, premium efficiency ○ Screw Supports (legs) • One (1) transition piece between Transfer Conveyor and Distribution Screw • Manufacturer: Martin Sprocket & Gear Inc. • Screw Conveyor will be shipped in (1) piece.



Process and Mechanical Equipment Items	Qty	Description
Distribution Screw	1	<p>A conveyor will be supplied to transfer sludge from the transfer screw (dried end product) and distribute to the end product bagging station.</p> <p>The distribution screw conveyor is detailed as follows:</p> <ul style="list-style-type: none"> • One (1) 9" diameter x 32' long screw conveyor <ul style="list-style-type: none"> ○ One (1) U-trough with cover ○ One (1) Over-Flow Door with rotary hinge actuated Limit Switch ○ One (1) Helicoid Screw, 31.5' long ○ Three (3) screw hangers with auto-lubricators ○ One (1) 2HP, 26 RPM screw conveyor drive, premium efficiency ○ Screw Supports (mounted to top of bag station platform) • Three (3) 10" x 10" Dust Tight Flat Pneumatic Slide Gate • Four (4) 12" Discharge Chutes • Manufacturer: Martin Sprocket & Gear Inc. • Screw Conveyor will be shipped in (1) piece.
End Product Bagging System	1	<p>Kruger shall supply (1) end product bagging system will be supplied to collect and store the dried end product from the BioCon dryer. Kruger will have these modular platforms fabricated to include frames, decking, and rails. See drawings and P&ID's for details (Section 5 of this proposal package).</p> <p>The following bagging station shall be included as part of Kruger's Scope:</p> <ul style="list-style-type: none"> • Bulk Bag Platform is detailed as follows <ul style="list-style-type: none"> ○ Bulk Bag Platform Approximately 8' W x 36' L x 10' H. ○ Main frame is quoted as 6 x 4 Angle, will be painted (2) coats epoxy gray ○ Sub-frame is quoted as 3 x 3 Angle, will be painted (2) coats epoxy gray ○ Frame will be shipped in (3) sections. ○ Decking will be diamond plate ○ Hand rails will be sch. 40 pipe and painted yellow ○ (1) set of stairs is included to go to the floor ○ Treads will be galvanized bar grating with bullnose ○ Legs for the this platform are quoted as W4 x 13, will be painted (2) coats epoxy gray ○ Legs will have pads to be bolted to the main frame for re-assembly ○ Angle braces will be supplied as needed and are quoted as 1 ½" x 1 ½" Angle ○ (4) sets of (4) springs are included and mounted ○ (4) scales with digital readouts are included and readouts will be mounted on the frame ○ (8) bulk bags are included ○ (4) pallets are included (used for bag changes) ○ Frame work for conveyors is not included; the mounting plates are included for these additional frames. ½" plates (pattern TBD) • Frame shall be Carbon Steel Square I-Beam, C-Channel, and Angle sized as needed • All Skid Frame welds will be cleaned and prepped for paint or galvanizing • Welds will be consistent and crevice free • All legs will have mounting pads at the floor ½" thick plates • One Hundred (100) Bulk Bags, 40" x 40" x 80", 2,000 lb capacity • Scope of work by others <ul style="list-style-type: none"> ○ Assembly of platforms in the field. Platforms will be shipped in three (3) sections with legs shipped loose and any reconnection points labeled. ○ Wiring of the scales is not included, inclusive of display wiring, and power to both scales and display.



Process and Mechanical Equipment Items	Qty	Description
Valves	Lot	<p>A number of valves will be supplied for BioCon operation. They are as follows.</p> <p><u>Automated Valves:</u></p> <ul style="list-style-type: none"> • One (1) – 12" Sludge Cake Recirculation Valve • Two (2) – 12" Sludge Cake Feed Valve • One (1) – 12" Sludge Cake Bypass Valve • Two (2) – Sprinkler Valve, 1.25" solenoid • One (1) – Condenser Water Control Valve, 3" • One (1) – Condenser Solenoid, 1.5" • Three (3) – Distribution screw Automated Slide Gates <p><u>Manual Valves</u></p> <ul style="list-style-type: none"> • Four (4) – Wet Sludge Hopper manual slide gates • Two (2) – 1" Wet Cake Sample Port Ball Valve • Two (2) – 3" Wet Cake Sample Port Ball Valve • Eight (8) – 1" Manual Ball Valve for Dosing Pump Manifold • Eight (8) – 1" Manual Ball Valve for Sludge Depositor Station • Twenty-four (24) – 1.25" Manual 3-way valve • One (1) – Fire Protection PRV, 2" • One (1) – nozzle cleaning station main valve, 1" • One (1) – nozzle cleaning station pressure equalizing valve, 0.5" • One (1) – nozzle cleaning station pressure drain valve, 0.5" • One (1) – Condenser PRV, 3" <p>This list is an all inclusive list of valves. Some of these valves may be mentioned in other areas of this scope of supply, but are included in this list.</p>
Air Compressor System	1	<p>An air compressing system shall be provided to be used to actuate automated valves. The following equipment is included as part of the air compressing system:</p> <ul style="list-style-type: none"> • One (1) AirCenter SM 10 Compressor <ul style="list-style-type: none"> ○ Air Flow Rate: 42 cfm ○ Max Pressure: 125 psi ○ Motor: 10HP, 460/3/60 ○ Noise Level: 66 db(A), sound enclosure included • One (1) Clean Air Treatment Package • One (1) Condensate Treatment System • One (1) Air Receiver, 72 gallon, painted carbon steel.

4.2 INSTRUMENTATION AND CONTROLS

GENERAL

Kruger will supply controls, instrumentation, as detailed within this scope of supply. The instrumentation and equipment listed in this scope of supply are based upon the proposed process and equipment configuration, Kruger intends to supply only the instruments and equipment detailed in this scope of supply. This scope and the associated pricing will have to be modified to include any and all changes made for final design.

All PLC and OIT programming is based on Kruger standards, any requests or requirements that would deviate from this standard will result in additional costs. Kruger will be providing PLC/ OIT



programming only for the Kruger supplied PLC Control Panels. All PLC Programming, OIT Programming and OIT Graphic Screens will be in English, requests to provide in a different language will result in additional costs.

The PLC Program developed by Kruger, are for use on the Kruger supplied PLC only. The Kruger supplied PLC Program cannot be used, whole or any part for other uses.

Kruger will use Allen Bradley development software for PLC and OIT Programming; the development software is licensed to Kruger and will not be provided as part of this scope. Kruger will not be providing any PLC, Network, Operator Interface, SCADA, or Alarm Notification software.

Kruger will supply copies of the completed PLC and OIT programs at job completion. Prior to supplying completed PLC programs, Kruger requests that a non-disclosure agreement be signed and returned to Kruger.

Factory testing of the Kruger PLC Control Panel will be conducted by Kruger personnel at a Kruger selected Panel Facility. Kruger reserves the right to conduct this testing when it is deemed appropriate in regards to Kruger personnel. Kruger has established Panel testing criteria and will conduct all Panel and Software testing per Kruger standards. When said Panel/Software testing is complete a Test Report will be generated per Kruger standards. Other party's are welcome to witness panel testing at no expense to Kruger, testing can be witnessed at an agreed upon date that does not impact delivery or start-up schedules.

No other Instruments, Control Panel Components (PLC or other components) will be supplied unless they are explicitly listed in this Scope of Supply.

Drawings depicting conduit and wire is the sizing of conduit and wire is the responsibility of others.

BIOCON PLC CONTROL PANEL

Allen-Bradley ControlLogix processor based control panel will be supplied as described herein to control the BioCon system based on operator set points. All I/O will be wired to field terminations as required. The control panel will be completely assembled, tested, and programmed for the required functionality. The U.L. labeled panel will be comprised of the following:

BioCon Control Panel

Qty	Description	Manufacturer
1	NEMA 12 Painted Carbon Steel 90"H x 72"W x 24"D Freestanding Panel (SCE907224FSD) For use in an indoor, climate controlled, non-classified environment.	Saginaw
1	Back Panel for Control Panel 78"H x 68"W (SCE90P72F1)	Saginaw
1	10" Color Touchscreen Operator Interface (Panelview Plus 6 1000)	Allen Bradley
1	PLC Processor (1756-L72) Control Logix Processor	Allen Bradley
2	PLC Ethernet Module (1756-EN2T) Control Logix	Allen Bradley
2	PLC 17 Slot Chassis (1756-A17) Control Logix	Allen Bradley
2	PLC Power Supply (1756-PA72) Control Logix	Allen Bradley
11	PLC Digital Input Module 16PT 24VDC (1756-IB16) Control Logix	Allen Bradley



Qty	Description	Manufacturer
4	PLC Digital Output Module 16PT 24VDC (1756-OB16) Control Logix	Allen Bradley
5	PLC Analog Input Module 16PT 4-20mA (1756-IF16)	Allen Bradley
5	PLC Analog Output Module 8PT 4-20mA (1756-OF8)	Allen Bradley
1	120 VAC Surge Protector (HSPSP12030ARJ)	Innovative Tech
AR	Circuit Breakers	Square D or Equivalent
4	24VDC 5A Power Supply (QUINT-PS-100-240AC/24DC/5)	Phoenix Contact
80	4-20mA to 4-20mA Analog Isolator (28 64 40 6)	Phoenix Contact
60	4-20mA Analog Surge Arrestor (PT2x2 24DC ST)	Phoenix Contact
60	4-20mA Analog Surge Arrestor Base Element (PT2x2 24DC BE)	Phoenix Contact
240	Double Level Field Terminal Block (UTT B4)	Phoenix Contact
64	Interposing Relay w/Base for Digital Outputs	Allen Bradley
1	Uninterruptible Power Supply SDU850 850VA	Sola
1	Ethernet Switch 6 Port 10/100 Base T 2 SC Fiber Optic Port Industrial Ethernet Switch (FL SWITCH SFN 6TX/2FX 2891024)	Phoenix Contact
1	Cabinet Light & Convenience Outlet	Leviton or Equal
AR	Misc. Wire and Panduit	
1	Completed Panel Shop Tested and UL Labeled	Kruger
1	PLC /Operator Interface Programming for Kruger PLC	Kruger

NOTE: AR means As Required. The quantity of these items will be determined at the time of panel construction.

MOTOR CONTROL CENTER

The MCC system voltage will be 480VAC, 3 Phase, 60Hz. The MCC will be a NEMA 1 enclosure and must be mounted indoors in a climate controlled environment, 120VAC Control Power. The MCC will be installed and field wired by others. Field motor disconnects and control stations are by others.

Qty	Description	Manufacturer
1	MCC, System Voltage 480Y/277V 3PH 4W, 60Hz, xxxA Bus, 120VAC Control Power, Main Breaker Bottom Entry, NEMA 1 Enclosure	Square D
2	Two (2) 460VAC FVNR 2HP NEMA Motor Starter w/ Circuit Breaker, Electronic Motor Circuit Protector, Control Transformer, Green Motor Off Pilot Light, Red Motor On Pilot Light, Hand – Off – Automatic Selector Switch (Cake Bin Leveling Screw, Fill Drain Pump)	Square D
4	Four (4) 460VAC 1HP Adjustable Speed Drive w/ Circuit Breaker, Control Transformer, Altivar AC Drive, 3% Line Reactor, Green Motor Off Pilot Light, Red Motor On Pilot Light, Hand – Off – Automatic Selector Switch (Live Bottom Screw 1, 2, 3 and 4)	Square D
4	Four (4) 460VAC 15HP Adjustable Speed Drive w/ Circuit Breaker, Control Transformer, Altivar AC Drive, 3% Line Reactor, Green Motor Off Pilot Light, Red Motor On Pilot Light, Hand – Off – Automatic Selector Switch (Silo Main	Square D



Qty	Description	Manufacturer
	Pump 1, 2, 3 and 4)	
10	Ten (10) 460VAC 3HP Adjustable Speed Drive w/ Circuit Breaker, Control Transformer, Altivar AC Drive, 3% Line Reactor, Green Motor Off Pilot Light, Red Motor On Pilot Light, Hand – Off – Automatic Selector Switch (Dosing Pump 1, 2, 3, 4, 5, 6, 7 and 8, Vacuum Fan, Extraction Screw)	Square D
1	One (1) 460VAC 2HP Adjustable Speed Drive w/ Circuit Breaker, Control Transformer, Altivar AC Drive, 3% Line Reactor, Green Motor Off Pilot Light, Red Motor On Pilot Light, Hand – Off – Automatic Selector Switch (Sludge Depositor)	Square D
2	Two (2) 460VAC 1HP Adjustable Speed Drive w/ Circuit Breaker, Control Transformer, Altivar AC Drive, 3% Line Reactor, Green Motor Off Pilot Light, Red Motor On Pilot Light, Hand – Off – Automatic Selector Switch (Belt Drive Top, Belt Drive Bottom)	Square D
2	Two (2) 460VAC 40HP Adjustable Speed Drive w/ Circuit Breaker, Control Transformer, Altivar AC Drive, 3% Line Reactor, Green Motor Off Pilot Light, Red Motor On Pilot Light, Hand – Off – Automatic Selector Switch (Warm Zone Fan 1, Warm Zone Fan 2)	Square D
3	Three (3) 460VAC 25HP Adjustable Speed Drive w/ Circuit Breaker, Control Transformer, Altivar AC Drive, 3% Line Reactor, Green Motor Off Pilot Light, Red Motor On Pilot Light, Hand – Off – Automatic Selector Switch (End Fan Zone 1, End Fan Zone 2, Drying Air Treatment Fan)	Square D
2	Two (2) 460VAC FVNR 3HP NEMA Motor Starter w/ Circuit Breaker, Electronic Motor Circuit Protector, Control Transformer, Green Motor Off Pilot Light, Red Motor On Pilot Light, Hand – Off – Automatic Selector Switch (Transfer Conveyor, Distribution Conveyor)	Square D
2	Two (2) 460VAC FVNR 50HP NEMA Motor Starter w/ Circuit Breaker, Electronic Motor Circuit Protector, Control Transformer, Green Motor Off Pilot Light, Red Motor On Pilot Light, Hand – Off – Automatic Selector Switch (Thermal Fluid Pump, Thermal Fluid Pump Standby)	Square D
2	Two (2) 460VAC FVNR 20HP NEMA Motor Starter w/ Circuit Breaker, Electronic Motor Circuit Protector, Control Transformer, Green Motor Off Pilot Light, Red Motor On Pilot Light, Hand – Off – Automatic Selector Switch (Thermal Fluid Pump End Zone, Combustion Air Fan)	Square D
1	Panelboard Eighteen (18) Circuits, Main Circuit Breaker 120VAC 1Phase 3W 60Hz	Square D



BIOCON INSTRUMENTATION:

Kruger shall supply the field instruments as described herein.

Biocon Field Instruments

Qty	Description	Manufacturer
1	Radar Level Transmitter LM80 ACP801 FM P804 G800	ABB
1	Conductive Level Switch Liquipoint T FTW31-A2A2AB4A	Endress + Hauser
12	24VDC Loop Powered Pressure Transmitter Cerabar S PMC71	Endress + Hauser
21	Microswitch XCKL115	Square D
13	24VDC Loop Powered Temperature Transmitter w/Thermowell iTemp TMT162 TH13	Endress + Hauser
8	Temperature Switch LTS-N4-G-00-120-XNH	Ashcroft
2	Inductive Sensor/Low Velocity Switch XS618B1MAL2	Square D
3	Photo Electric Sensor 42GRL-9540	Allen Bradley
3	Photo Electric Sensor 42GRR-9500	Allen Bradley
10	Differential Pressure U-Tube Manometer 1223-xx-D Red Gage Fluid Fill	Dwyer
1	2" Magnetic Flowmeter w/Transmitter 53W50-HL0B1AC2BAAA	Endress + Hauser
5	Pressure Gauge 45-1279 w/Diaphragm Seal 50-201-SS	Ashcroft
1	Instrument Start-Up and Calibration	Kruger

Kruger will calibrate and start-up Instruments supplied by Kruger. Instruments supplied by others will require calibration and start-up by others.

4.3 DELIVERY AND ASSEMBLY OF EQUIPMENT

The BioCon system consists of 32 major mechanical components. This quantity represents the total number of individual components for installation by the General Contractor. Interconnecting components and appurtenances assembled onsite will be the responsibility of others. The following details the components that will be provided.

No. of Pieces Shipped	Equipment
2	Wet Sludge Hopper
4	Main Feed Pumps
4	Upper Platform Assembly (includes Dosing Pumps)
8	Lower Platform Assembly
1	Dryer Cabinet
1	Condenser
4	Thermal Fluid Heating System
1	Air Compressor
2	External Fans (Drying Air Treatment Fan and Vacuum Fan)
2	Transfer and Distribution Conveyor Screws
3	Bagging Station and Platform
Lot	Valves, shipped as available

The Contractor will be responsible for assembly of all equipment that is provided as part of this scope of supply. Refer to Section 12 for dryer installation photos for reference.



SECTION 5
Scope of Work



5.0 SCOPE OF WORK

Kruger is responsible for process design and equipment procurement required for the EXELYS system. Kruger's scope of work does not include any equipment, materials or other services not specifically defined in this proposal.

PROCESS DESIGN AND ENGINEERING

Kruger shall perform engineering in accordance with the applicable national codes, standards, and/or regulations (except where otherwise noted) in effect at the time of this proposal. Additionally, Kruger shall provide all necessary design, installation, and operating information for equipment within its stated scope of supply. Kruger is not responsible for the design, selection, installation, operation, or maintenance of any material, equipment, or services provided by others.

Kruger shall provide installation instruction and onsite advice. Kruger shall not supervise or assist directly.

Kruger shall provide process engineering and design support for the system as follows:

1. Equipment specification for all equipment supplied by Kruger
2. Technical instruction for operation and start-up of the system
3. Equipment layout drawings
4. Equipment installation instructions
5. O&M manuals

FIELD SERVICE

Kruger shall supply the following services of system trained representatives as detailed herein:

Purpose	Number of Days
Engineering Design Meetings	6 days, 2 trips
Installation, Startup and Functional/Operational Testing	15 days
Commissioning (BioCon Optimization) and Performance Testing	30 days
O&M and Process Training	10 days, 2 trips

NOTES:

1. A standard work day is to be defined (i.e. 8AM to 5PM local time). This work shall be conducted Monday through Friday, exclusive of traditional US holidays.
2. For the installation, startup, testing, commissioning, a representative shall be based within Juneau, AK for the time period noted. The days noted may not be continuous as travel to and from the site is necessary. The representative shall work a standard work day/week per Note 1.
3. Travel time to Juneau requires one full day of travel to and from the City of Juneau. The days noted above are man-days onsite, excluding travel.

Man-days required beyond those provided will be billed at Kruger's published standard rates at time of service. (Kruger's current estimated rate is \$1250/day plus travel and living expenses.) Such additional days could become necessary for correction of improperly installed equipment or instrumentation, prolonged construction time, or Contractor's failure to properly coordinate start-up and training.



SECTION 6

Scope of Work by Others



6. SCOPE OF SUPPLY BY OTHERS

Unless otherwise indicated in this Scope of Supply document, the Contractor shall furnish the following items. The Contractor's scope is not necessarily limited to this list:

1. Others shall provide access to the basins and facilities for Kruger field personnel to inspect the installed Kruger equipment. This access shall include, but not be limited to, the following:
 - a. Safe ingress and egress at the basins.
 - b. Equipment, personnel, assistance, training and permitting for confined space entry, if applicable.
 - c. Tank dewatering and sludge removal, if necessary.
 - d. Provisions, such as scaffolding or lifting devices, to allow the Kruger inspector to gain close access to installed equipment for a complete and proper inspection.
 - e. Sufficient lighting for safety and inspection visibility purposes.
 - f. Provisions for atmospheric monitoring and ventilation, if necessary.
 - g. Personnel available to provide remedy for items that can be corrected during or just after the inspection.
2. Receiving (preparation of receiving reports), unloading, storage, maintenance preservation and protection of all equipment, and materials provided by Kruger Inc.
3. Installation of all equipment and materials provided by Kruger Inc.
4. Supply, fabrication, installation, cleaning, pickling, and/or passivation of all stainless steel piping components not provided by Kruger Inc.
5. Supply and installation of all flange gaskets and bolts for all piping components not supplied by Kruger Inc.
6. Supply and installation of all pipe supports not supplied by Kruger Inc.
7. Installation, termination and field wiring of all control panels, instrumentation and equipment supplied by Kruger Inc.
8. Supply and install all electrical power and control wiring and conduit to the equipment served plus interconnection between Kruger's furnished equipment as required, including wire, cable, junction boxes, fittings, conduit, etc.
9. Supply and install all ductwork and interconnecting piping; inclusive of insulation and cladding.
10. Provide all anchor bolts and mounting hardware not provided by Kruger Inc.
11. Provide and install all piping required to interconnect to the Supplier's equipment.
12. Provide all nameplates, safety signs and labels.
13. The Contractor shall coordinate the installation and timing of interface points such as piping and electrical with the Supplier.
14. Supply and install all sunshields and/or additional enclosures as needed when installing equipment and instrumentation outdoors.
15. Video recording of training activities.
16. All other necessary equipment and services not otherwise listed as specifically supplied by Kruger Inc.



Sample Insurance Certificate





CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)
12/30/2014

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Marsh USA, Inc. 540 W. Madison Street Chicago, IL 60661 Attn: Veolia.CertRequest@marsh.com Fax: 212-948-5053	CONTACT NAME:		
	PHONE (A/C, No, Ext):	FAX (A/C, No):	
	E-MAIL ADDRESS:		
INSURED I. Kruger Inc. 4001 Weston Parkway Cary, NC 27513	INSURER(S) AFFORDING COVERAGE		NAIC #
	INSURER A: ACE American Insurance Company		22667
	INSURER B: ACE Fire Underwriters Co		20702
	INSURER C: Illinois Union Insurance Company		27960
	INSURER D: N/A		N/A
	INSURER E:		
INSURER F:			

COVERAGES **CERTIFICATE NUMBER:** CHI-004790567-22 **REVISION NUMBER:** 10

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	GENERAL LIABILITY <input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: <input checked="" type="checkbox"/> POLICY <input type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC			HDO G27340167	01/01/2015	01/01/2016	EACH OCCURRENCE \$ 1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 1,000,000 MED EXP (Any one person) \$ 10,000 PERSONAL & ADV INJURY \$ 1,000,000 GENERAL AGGREGATE \$ 2,000,000 PRODUCTS - COMP/OP AGG \$ 2,000,000
A	AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> HIRED AUTOS <input type="checkbox"/> NON-OWNED AUTOS			ISA H0883040A	01/01/2015	01/01/2016	COMBINED SINGLE LIMIT (Per accident) \$ 1,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$
	UMBRELLA LIAB <input type="checkbox"/> OCCUR EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE DED <input type="checkbox"/> RETENTION \$						EACH OCCURRENCE \$ AGGREGATE \$
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below			WLR C48139814 (AOS)	01/01/2015	01/01/2016	<input checked="" type="checkbox"/> WC STATUTORY LIMITS <input type="checkbox"/> OTHER
B			N/A	SCF C48139838 (WI)	01/01/2015	01/01/2016	EL. EACH ACCIDENT \$ 1,000,000 EL. DISEASE - EA EMPLOYEE \$ 1,000,000 EL. DISEASE - POLICY LIMIT \$ 1,000,000
C	Contractors' Pollution and Professional Liability			GOO G27289096 001 CPL SIR = \$250,000	07/01/2013	01/01/2016	Each Occurrence 1,000,000 Prof Liab SIR = \$1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)
 Evidence of Insurance.

CERTIFICATE HOLDER I. Kruger Inc. 4001 Weston Parkway Cary, NC 27513	CANCELLATION SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS. AUTHORIZED REPRESENTATIVE of Marsh USA Inc. Manashi Mukherjee
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Additional Dryer Options



Section 4: Additional Dryer Options

Please note that the following document is attached and referenced below:

- BioCon Thermal Dryer End Product Capabilities
- BioCon Sludge Drying Solutions Brochure

As part of Veolia, Kruger is backed with an extensive capabilities, expertise, and experience that will provide the best solution for Juneau. Kruger can offer a complete process solution including centrifuges, end product hopper, end product enhancement, and an energy recovery system. All of these enhancements have been used at our existing USA installations. Kruger has first-hand experience with all equipment being offered. Through Veolia preferred pricing, we are able to provide high quality equipment and components and Kruger has the experience to do it right.

Kruger can offer as much instrumentation and control as necessary to operate the drying system and plant as automated as preferred. Everything from level sensors to alarms to text notifications can be implemented into the system.

Dry Product Silo

Kruger has proposed bagging stations as part of our offering. But with a plant this size, a good sized bagging station like the one Kruger is offering would require removal and replacement in a few hours. A dried product storage silo can greatly increase and automate the need to handle the sludge.

This sludge could potentially be stored outside and even be equipped with a slide gate that could allow the sludge to be dropped directly into a waiting truck or trailer to haul it away. Safety systems can be put in place to negate any risk involved, and all this can be relayed to the plant control room for constant monitoring.

End Product Enhancement

Kruger is able to refine the dried BioCon product into a more desirable end product. This includes compacting the end product (increasing density to more than double the standard density) and refining its shape.

Many things can determine if this is something that would be advantageous, including hauling costs, availability options for disposal, and even how the end product can be used. In the case of Juneau, hauling costs have historically been a real concern. Manipulating the dried product so it fits more tightly into a shipping container would be advantageous. If used as a fertilizer, it might be a possibility to be used or distributed locally. End product enhancements might be something to consider.

Kruger offers different types of equipment that allow the end product to be crushed, pelletized, or turned into beads. Refer to the attached document 'BioCon Thermal Dryer End Product Capabilities' for more details.



Energy Exchange System

An energy exchange system on the drying air loop can also be offered as an option. The recovered heat in the form of warm water may be used as a low temperature energy source for multiple purposes such as digester or building heating. The energy exchange system works by separating the standard condenser system into two stages. For more information on this option, please reference the BioCon Sludge Drying Solutions Brochure.

Energy Recovery System

A biosolids furnace that supplies the energy for the drying process is also available for integration into the BioCon drying process, named the BioCon Energy Recovery System (BERS). This system allows for the biosolids to be used as a fuel source to intern create energy or be used as a heat source to supplement some heat for drying the biosolids. This process will make the biosolids into an ash, reducing the weight of the disposed product even more. For more information on this option, please reference the BioCon Sludge Drying Solutions Brochure.

Extended Warranty

Kruger included a one (1) year warranty as part of the Bid Submittal. Kruger is able to offer an extended warranty for equipment, if desired. An extended warranty can reduce risk of equipment malfunctions and eliminate the hassle of arranging repair and service of defective equipment. Warranty service would be conducted by one of Kruger's certified customer support representatives, such as Murray & Associates (located in Juneau) or directly by Kruger's Customer Service department with the support from our vendors. For more detail from about our Customer Service department, please refer to Section 9.

If any of these options are of interest to the City/Borough of Juneau and more information is needed, please contact Kruger; we are happy to supply more information and discuss these further. Please contact our project representative for more details.





BioCon Thermal Dryer End Product Capabilities

The BioCon Thermal Dryer system provides that ability for municipalities to produce an end product specific to the local nutrient market. Biosolids out of the BioCon system are dried to a minimum dry solids content of 90% and have a granulate consistency that meets Class A requirements for vector attraction and pathogen reduction. The processed biosolids out of the BioCon system typically are suitable, and in fact, sometimes are the preferable end product, for final disposal via most agricultural routes (assuming the product meets other requirements such as allowable metal content).

The BioCon end product can be further enhanced by including particle sizing equipment as an option. Depending on the target market of the municipality, Kruger can provide three different equipment options to meet the specified size, shape and bulk density set by the local nutrient market. Kruger developed these options by teaming with local agronomists to identify the options for marketing and selling biosolids around the country and provides solutions to meet the client's regional needs. These options are further described below.

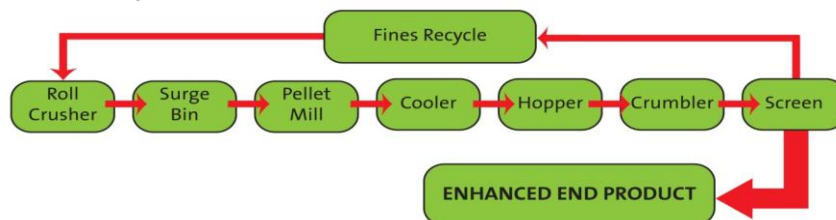
Adjustable Enhanced Particle Sizing

For this option, the BioCon end product is fed into a roll crusher which crushes the biosolids into a fine material. The fine material is then processed within the pelletizer by introducing into the top of the die and as the die rotates a roller presses the biosolids through the holes in the die. A cutter then cuts the pellet from the die, creating a pellet. A crumbler breaks apart the pellet which is then screened to a target size, such as 0.5 to 4.0 mm. The range of bulk densities achieved is 35 to 45 pounds per cubic foot. The oversized and undersized particles that do not meet the specification are recycled back to the roll crusher to be re-processed removing any complicated steps of back mixing the product into the dryer feed.



Enhanced End Product

Enhanced Particle Sizer System PFD



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End Product Crusher

For this option, the dried product from the dryer is fed into a simple one step crusher that takes the bulk density up to 25 to 30 pounds per cubic foot. This process is ideal for facilities that need to maximize onsite storage capacity for seasonal agricultural pickups. The crushed product can reduce silo, bulk bag or dumpster storage by 50%. The crusher system is completely enclosed eliminating dust generation issues. The simplicity of the process makes it the most cost efficient product handling equipment offered.



Crushed End Product

Adjustable Spherical Particle Sizing

This option takes the BioCon end product and crushes it down to a fine powder before entering a pin mixing system. The pin mixer is a paddle drum style device rotating at several hundred RPMs that generates a spherical micro-pellet. A light mist is applied to the dried product as it enters the drum to promote the fine mixing and agglomeration of the particles. The system is completely enclosed so no dust will escape from the process. The pins can be easily adjusted to size the particles accordingly within the system. The final end product is conveyed into standard storage for biosolids. The Adjustable Spherical Particle Sizing systems offer great flexibility in the end product size and shape; thus, allowing the BioCon processed biosolids to be adjusted to meet the specific requirements of the market to be served, providing municipalities the ability to achieve the premium market value.



Example Spherical End Product*

In summary, local specifications, such as size, shape and bulk density, for the marketing and selling of biosolids exist on a state by state basis and within each individual market (i.e. agriculture, golf courses, and fertilizer blenders). These factors need to be considered carefully to understand what the market demands for an end product and allow cities to meet these requirements. Kruger has developed the above options to provide the municipalities and design engineers the ability to use the BioCon end product to meet the market specifications.

*Source: <http://www.marsmineral.com/pelletizing.htm>

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BioCon™

Sludge Drying Solutions

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A BioCon sludge drying plant is especially designed for drying of dewatered sludge from municipal and industrial wastewater treatment plants.

BioCon sludge drying plants are furthermore CE marked and comply with current EU and national rules, regulations and directives.

The BioCon Dryer

BioCon is a dual-belt low temperature dryer designed to be one of the safest dryers on the market while maintaining easy and efficient operations.

BioCon uses innovative depositors within the dryer to deposit thin strings of dewatered sludge on the first drying belt. The depositor system ensures a large evaporation surface area while the circulated drying air evaporates the water from the sludge.

BioCon operates with a drying air temperature range from 180 °C on the first belt to 80-100 °C on the end belt. The sludge residence time in the dryer is more than 60 minutes and the dried sludge meets the US EPA requirements for Class A pathogen reduction.

Features and benefits

- ▶ Safe operation due to low drying temperature and minimal dust emission.
- ▶ Flexible in regards to energy and heat source
- ▶ No odour release to surroundings due to negative pressure drying air system
- ▶ Designed for intermittent as well as non-stop operation
- ▶ Low operation and maintenance costs
- ▶ Delivers disinfected and granulated dried biosolids. The end product meets the US EPA Class A requirements
- ▶ Easily expanded with BioCon Energy Recovery System (BERS)
- ▶ Easily expanded with BioCon Energy Exchange System (BEES)



Efficient Drying Without Odour

Energy is supplied indirectly by a heat exchanger to heat the drying air. A circulation fan provides the necessary air velocity around the sludge strings to ensure the water evaporation from the sludge.

To remove the moisture and particulate matter from the wet drying air a certain amount of the drying air is taken into the condensing air loop and sent through the condenser before returning to the drier.

As the entire dryer unit is kept at a low negative pressure by the vacuum air fan and the drying air as well as the condensing air loops are enclosed cycles the system ensures an odourless operation.

Sludge into the Dryer

From the sludge cake buffer silo any combination of primary, secondary or digested sludge is pumped into the BioCon dryer.

To ensure effective depositing on the belt the dried solids content in the dewatered sludge should be between 10% and 30% DS.

The BioCon depositor system creates a large evaporation surface in the sludge strings which allows the drying process to operate at:

- ▶ Low drying temperature
- ▶ Short retention time
- ▶ Elimination of back-mixing

The BioCon drying plant is designed for intermittent as well as non-stop operation. The BioCon drying plant is fully monitored and controlled by the state of the art Siemens PCS7 SCADA system which allows unattended operation also outside normal working hours.

Flexible Energy Sources

The flexible BioCon dryer uses several energy sources to provide the needed heating fluid for the drying air heat exchanger.

Heating fluids

The simple BioCon dryer enables flexibility in choice of heating fluids as:

- ▶ Hot air
- ▶ Steam
- ▶ Hot oil
- ▶ Hot oil / hot water

Combinations

The simple and flexible BioCon dryer operates in easy combination with:

- ▶ Gas Engine
- ▶ Boiler
- ▶ Steam Generator
- ▶ Air Heater
- ▶ BioCon Energy Recovery System (BERS)
- ▶ BioCon Energy Exchange System (BEES)

BioCon Energy Recovery System (BERS)

The BioCon Energy Recovery System (BERS) reduces the total output of the plant to 5-10% of the original sludge cake quantity.

BERS provides thermal energy for the drying process. BERS will be self-sufficient regarding thermal energy at 20-25% DS content in sludge cake.

The BioCon Energy Recovery System includes a movable grate furnace for burning of the dried sludge, a heat exchanger for flue gas/drying air and a compact dry flue gas treatment system.

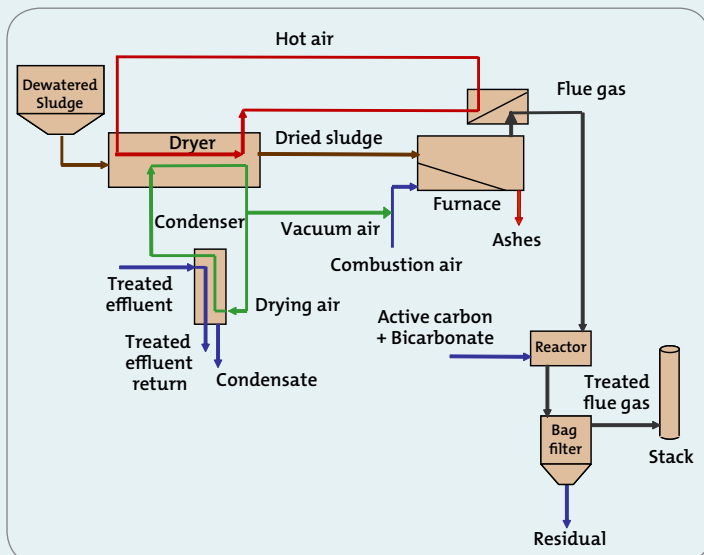
The installation for flue gas treatment consists of equipment for dosing of bicarbonate and activated carbon and a bag filter for residuals.

BioCon Energy Exchange System (BEES)

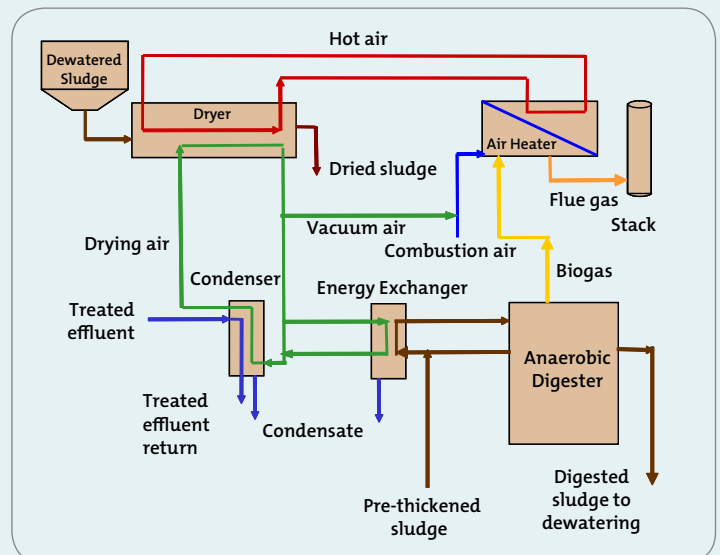
Sludge digestion combined with the BioCon Energy Exchange System (BEES) provides an essential reduction in the need for external energy supply.

BEES utilizes the opportunity for energy transfer between the dryer condensing air and the sludge digestion heat system. Frequently sludge digestion and BEES will turn out autothermic.

BioCon Energy Recovery System (BERS)



BioCon Energy Exchange System (BEES)





BioCon™ Sludge Drying Solutions

Selected Reference Plants



1999: Randers Wastewater Treatment Plant, Denmark
1,600 tons dry solids per year



2003: Mora Wastewater Treatment Plant, Sweden
840 tons dry solids per year



2006: Haapavesi Wastewater Treatment Plant, Finland
1,500 tons dry solids per year



2006: Draguignan Wastewater Treatment Plant, France
1,638 tons dry solids per year



2006: Mystic Lake Wastewater Treatment Plant, USA
333 tons dry solids per year



2001: Bjergmarken Wastewater Treatment Plant, Roskilde, Denmark
1,675 tons dry solids per year

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Drawings





Section 5: Drawings

Kruger prepared drawings to support this bid as requested. Process and Instrumentation Diagrams have also been assembled to help understand the process and layout of the proposed BioCon System.

Please note that the following documents are attached:

- Preliminary General Arrangement Drawing
- Process Flow Diagram
- Process and Instrumentation Diagrams (P&ID's)
- Heat and Mass Balance during Summer Operation
- Heat and Mass Balance during Winter Operation

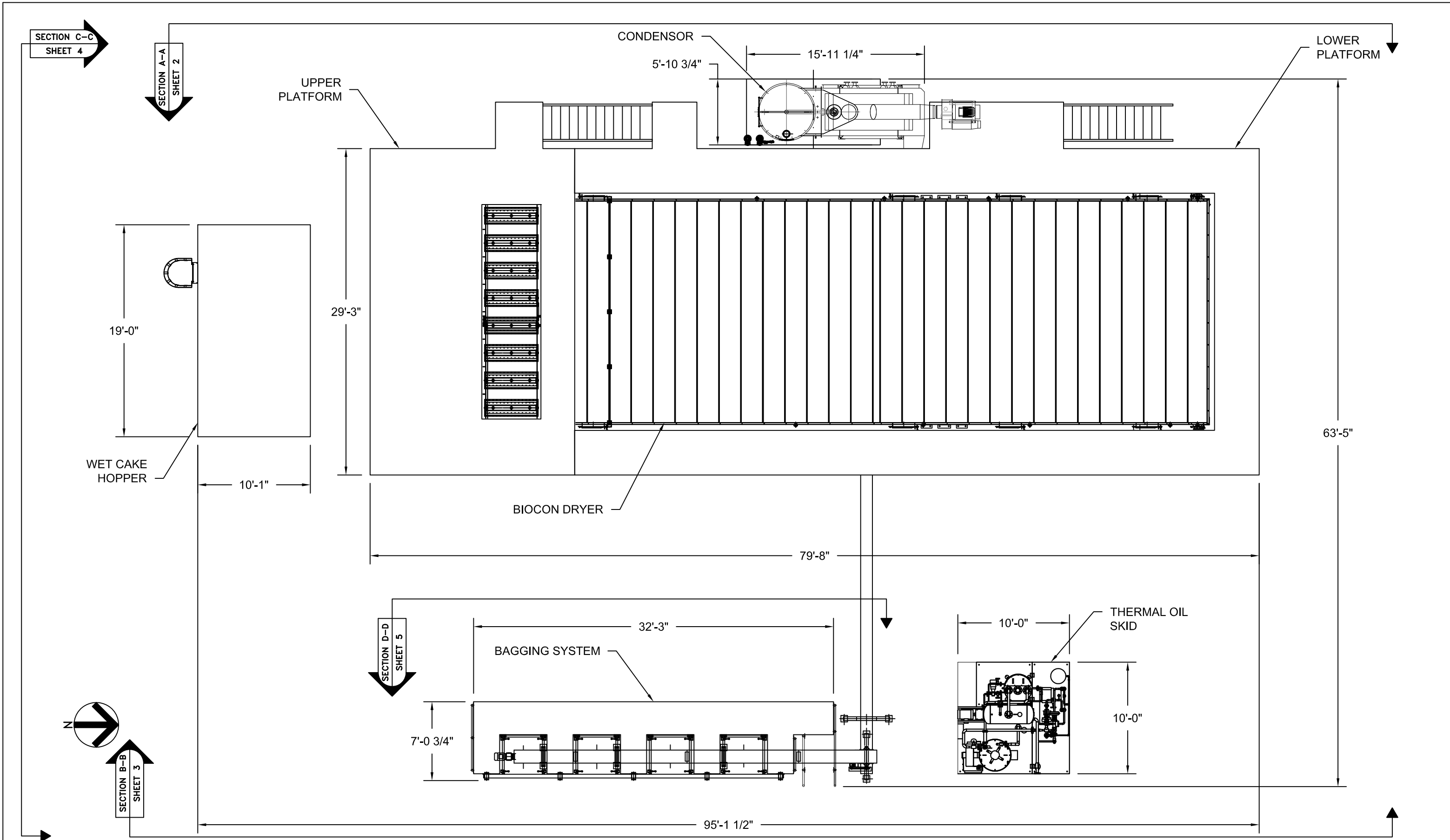


PACKAGE NAME: PROPOSAL
 PROJECT NUMBER: 5700102402
 PROJECT NAME: JUNEAU, AK

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 CREATED BY: SRW

ITEM	DRAWING NUMBER	DESCRIPTION	REVISION
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2	850M-0002	SITE LAYOUT, 8318 DRYER	A
3	850P-0000	PROCESS FLOW DIAGRAM	A
4	850P-0001	PIPING & INSTRUMENTATION DIAGRAM, SLUDGE FEED	A
5	850P-0002	PIPING & INSTRUMENTATION DIAGRAM, DOSING PUMP HEADER 1	A
6	850P-0003	PIPING & INSTRUMENTATION DIAGRAM, DOSING PUMP HEADER 2	A
7	850P-0004	PIPING & INSTRUMENTATION DIAGRAM, DOSING PUMPS (1-4)	A
8	850P-0005	PIPING & INSTRUMENTATION DIAGRAM, DOSING PUMPS (5-8)	A
9	850P-0006	PIPING & INSTRUMENTATION DIAGRAM, DEPOSITOR MANIFOLDS AND SHAFTS	A
10	850P-0008	PIPING & INSTRUMENTATION DIAGRAM, COMPRESSED AIR SYSTEM	A
11	850P-0009	PIPING & INSTRUMENTATION DIAGRAM, NOZZLE CLEANING AND SPRINKLER WATER	A
12	850P-0010	PIPING & INSTRUMENTATION DIAGRAM, SLUDGE DRYER	A
13	850P-0011	PIPING & INSTRUMENTATION DIAGRAM, DRYING AIR TREATMENT	A
14	850P-0012	PIPING & INSTRUMENTATION DIAGRAM, THERMAL OIL SYSTEM	A
15	850P-0014	PIPING & INSTRUMENTATION DIAGRAM, DRIED SLUDGE BAG STATION	A
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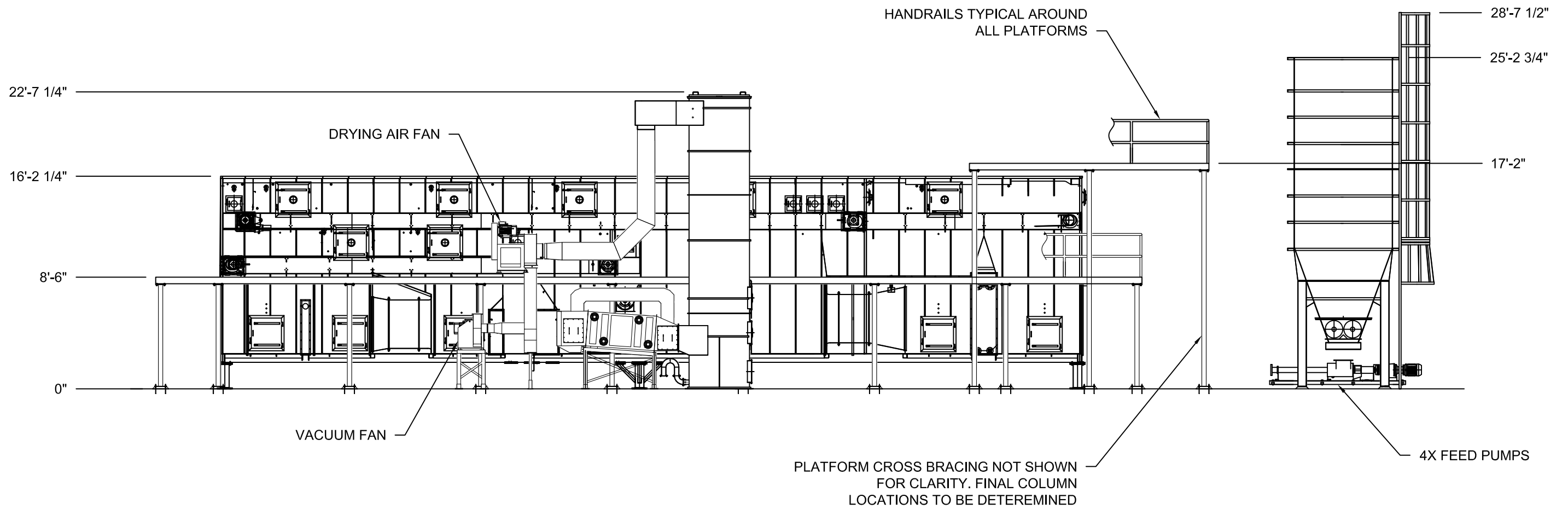
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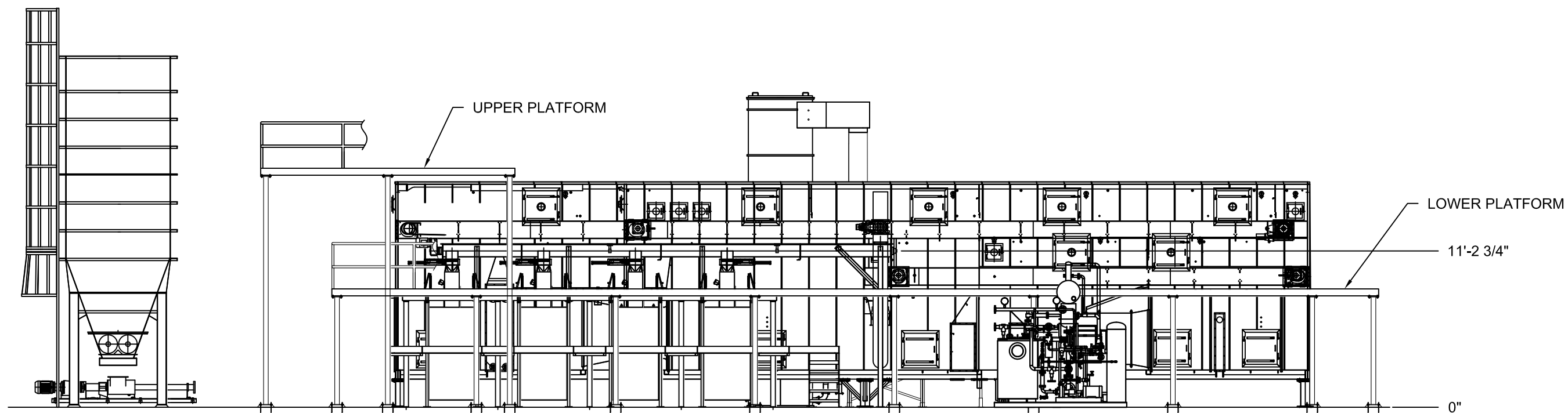


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GENERAL ARRANGEMENT
8318 DRYER

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SECTION B-B

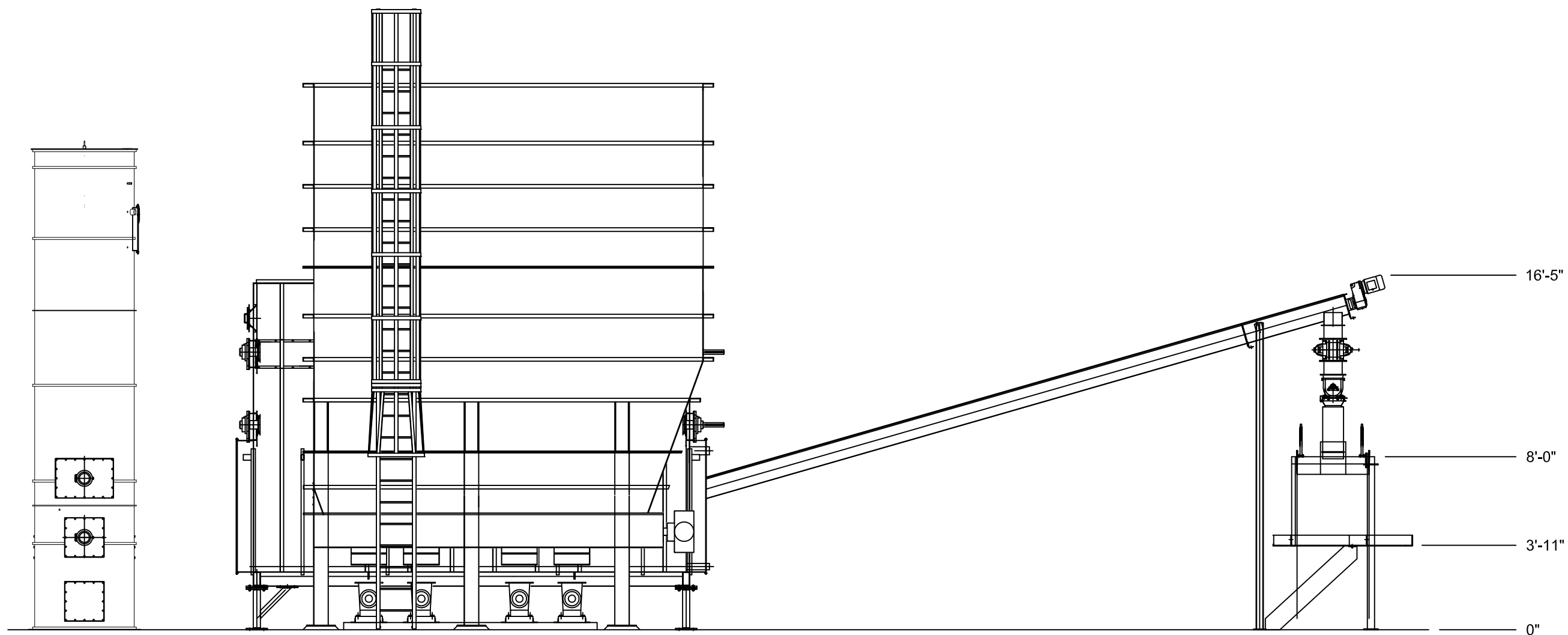
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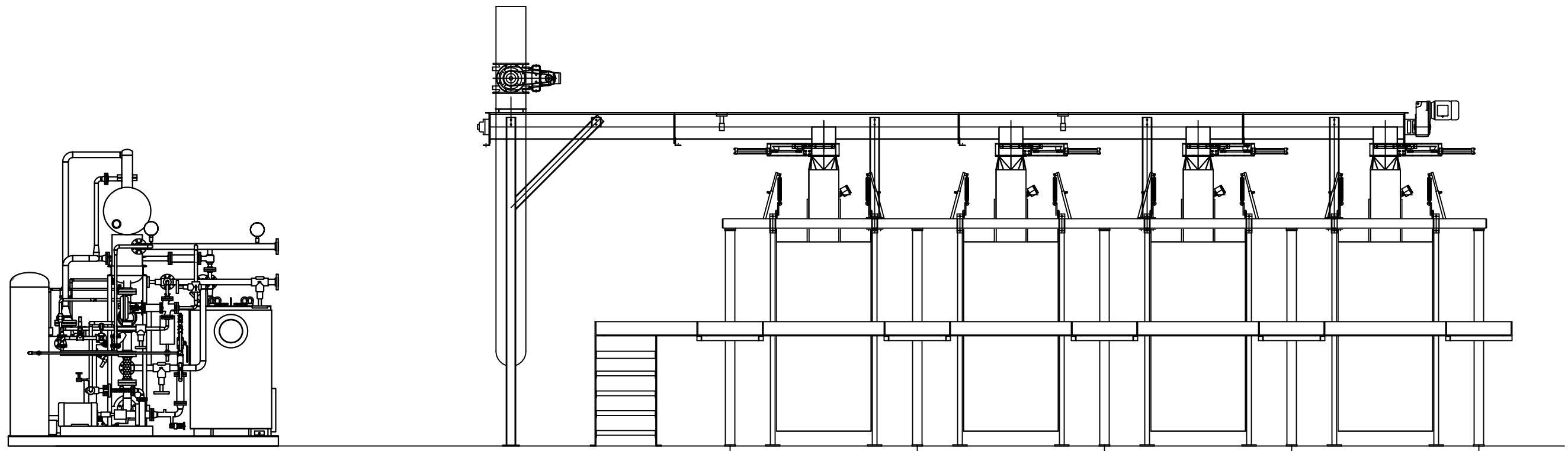


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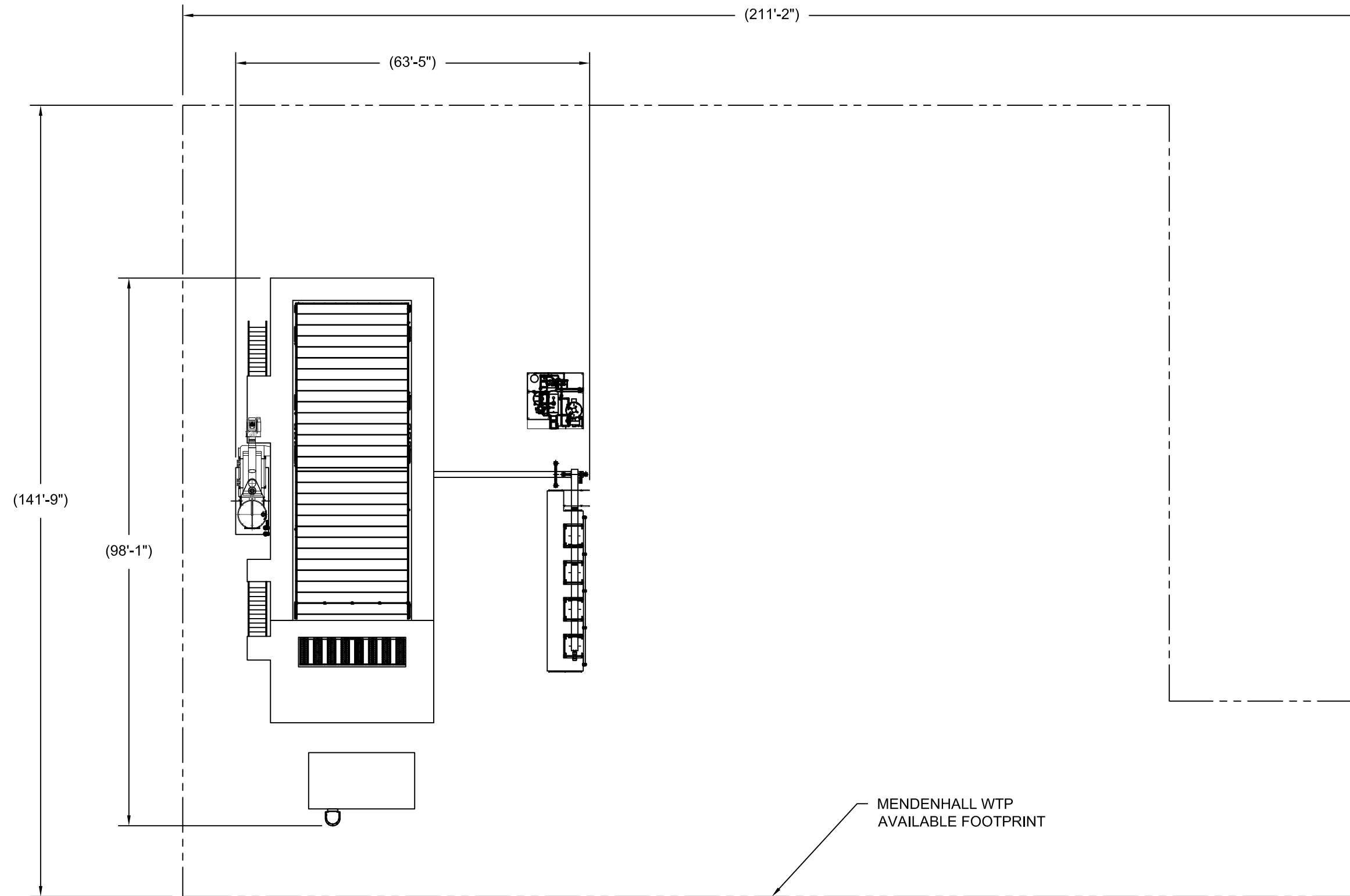
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NOTES:
 1. SUGGESTED EQUIPMENT ARRANGEMENT. FINAL ARRANGEMENT TO BE DETERMINED.

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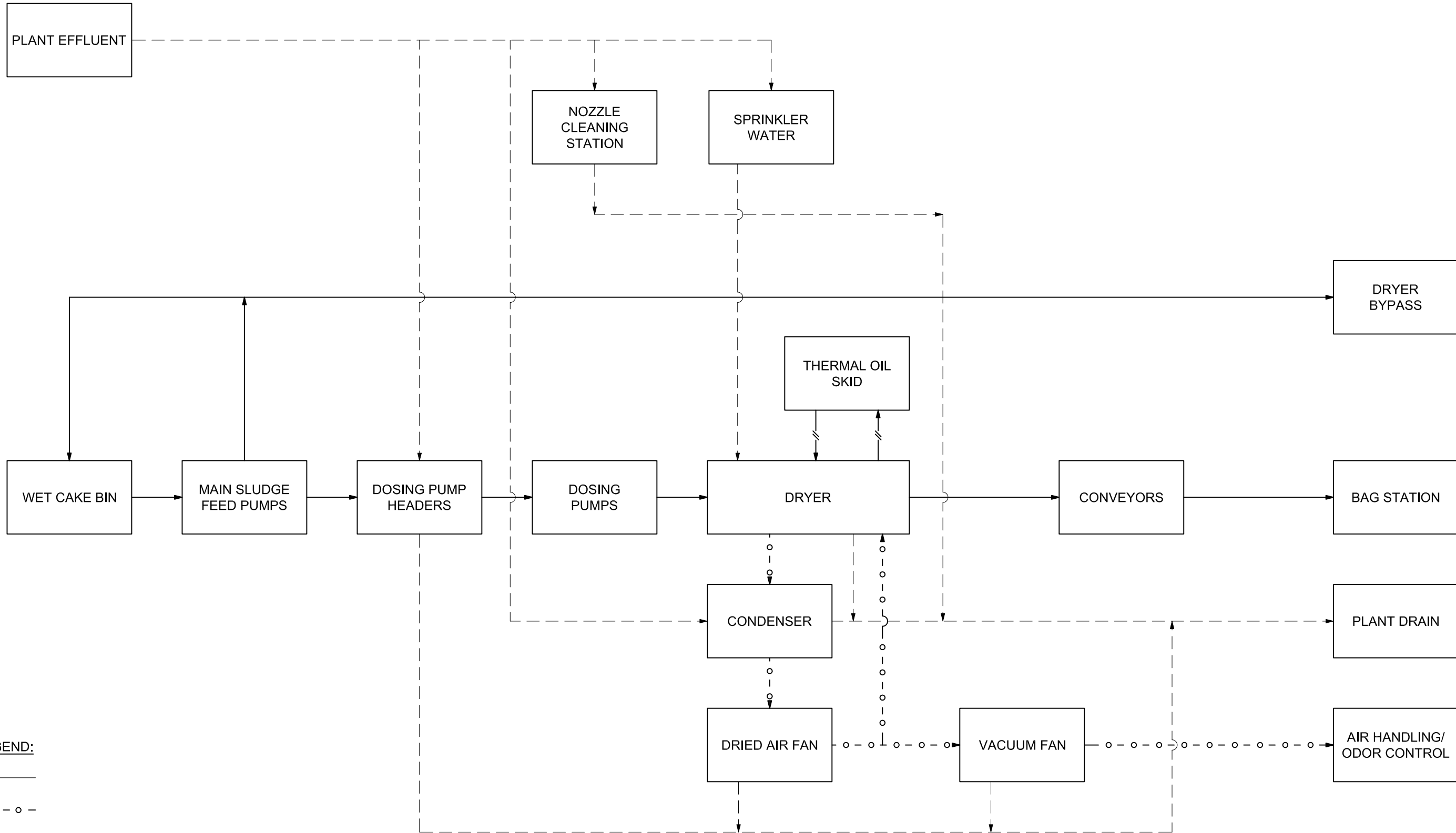
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BIOCON
 SITE LAYOUT
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PFD LINE LEGEND:

- SLUDGE ———
- AIR - o - o -
- WATER - - - - -
- OIL -// -// -

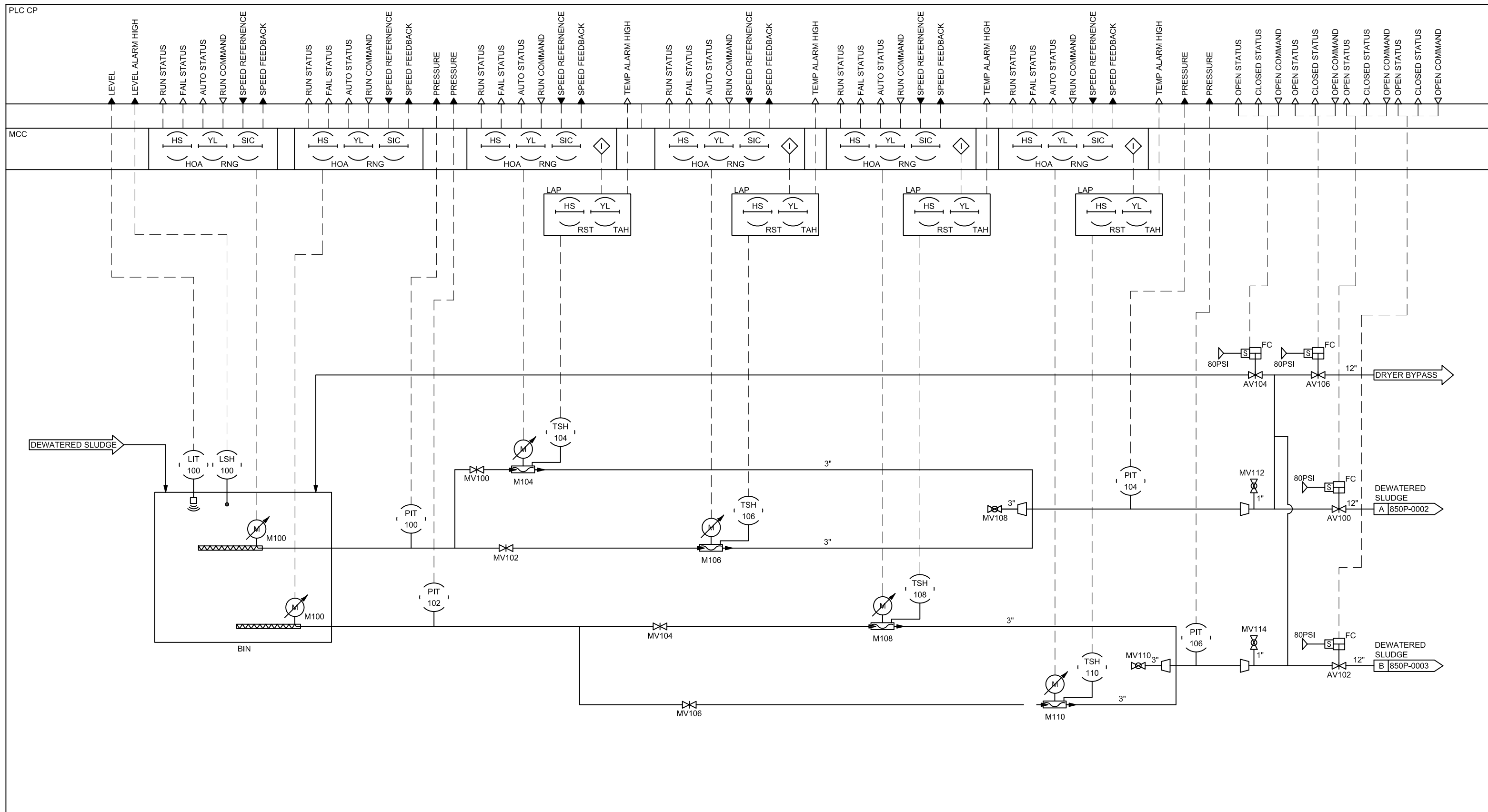
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BIOCON PROCESS FLOW DIAGRAM					
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- NOTES:
1. AIR LINES AND ISOLATION VALVES FOR KRUGER SUPPLIED PNEUMATICALLY ACTUATED VALVES ARE TO BE PROVIDED BY THE INSTALLATION CONTRACTOR.
 2. ITEMS WITHOUT TAG NUMBERS ARE SUPPLIED AND INSTALLED BY INSTALLATION CONTRACTOR.
 3. PROCESS PIPING SCOPE OF SUPPLY IS DESIGNATED BY LINETYPE.
 4. REFER TO P&ID LEGENDS FOR LINETYPE AND SYMBOL DESCRIPTIONS.

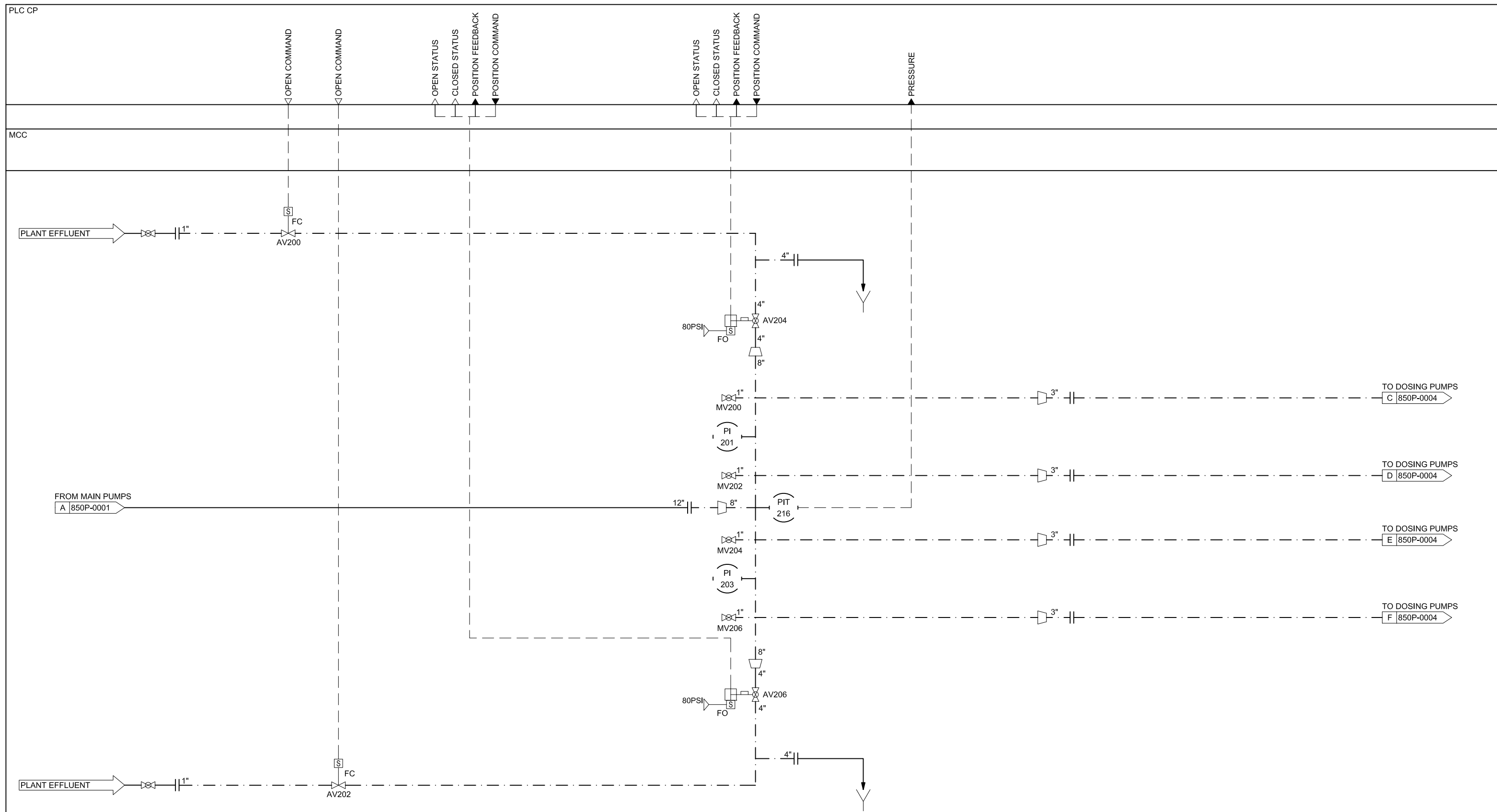
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5700102402
 JUNEAU, AK

BIOCON PIPING & INSTRUMENTATION DIAGRAM SLUDGE FEED					
DRAWN SRW	CHECKED JJM	SCALE 1:2	DRAWING NO 850P-0001	SHEET 1 of 1	REV A

REV	A	PRELIMINARY RELEASE	SRW	JJM	05.14.15
		DESCRIPTION	DRAWN	APPR	DATE



- NOTES:
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 2. ITEMS WITHOUT TAG NUMBERS ARE SUPPLIED AND INSTALLED BY INSTALLATION CONTRACTOR.
 3. PROCESS PIPING SCOPE OF SUPPLY IS DESIGNATED BY LINETYPE.
 4. REFER TO P&ID LEGENDS FOR LINETYPE AND SYMBOL DESCRIPTIONS.

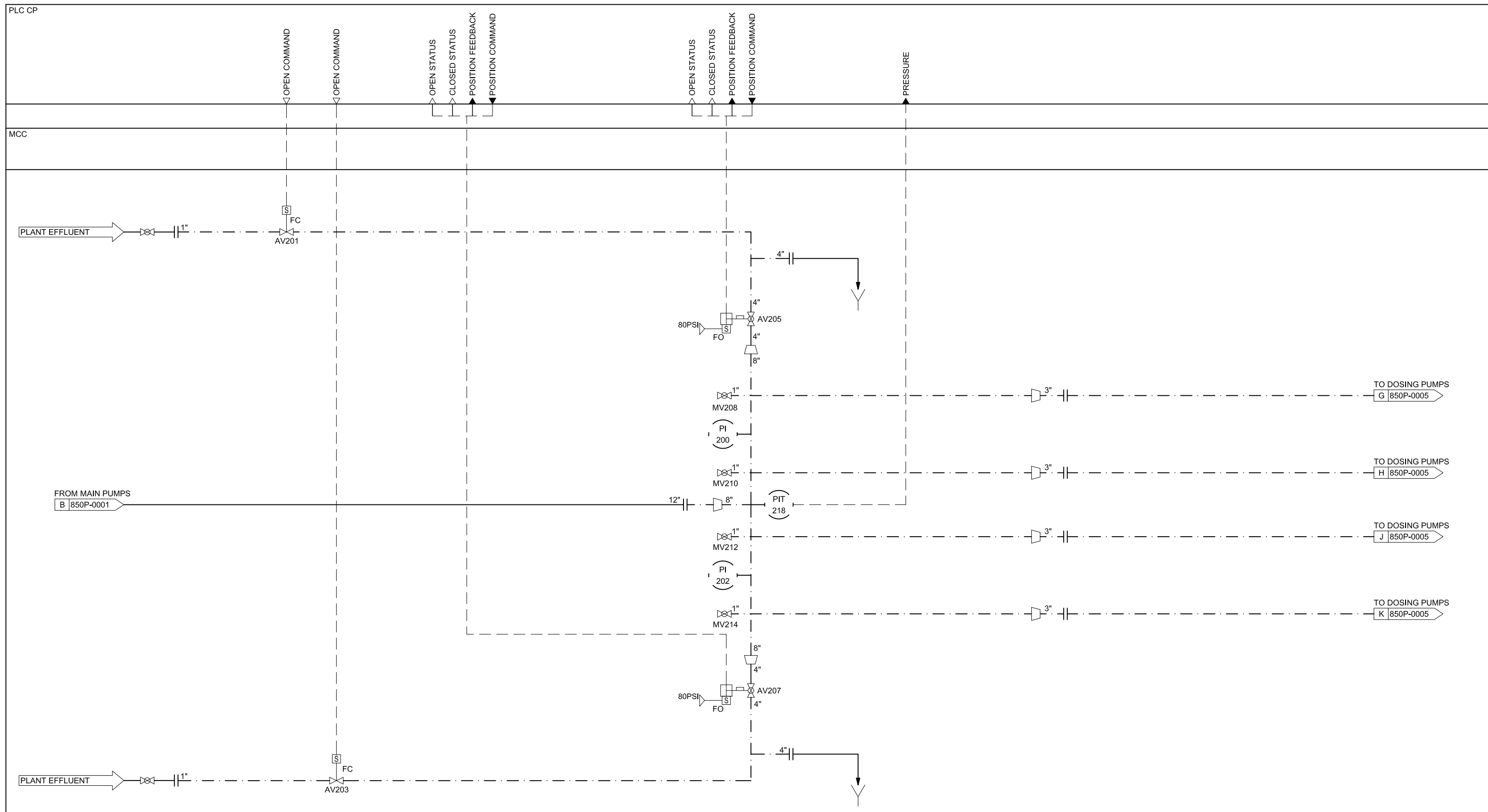
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BIOCON					
PIPING & INSTRUMENTATION DIAGRAM					
DOSING PUMP HEADER 1					
DRAWN HJH	CHECKED JJM	SCALE 1:2	DRAWING NO 850P-0002	SHEET 1 of 1	REV A

REV	DESCRIPTION	DRAWN	APPR	DATE
A	PRELIMINARY RELEASE	HJH	JJM	06.03.15



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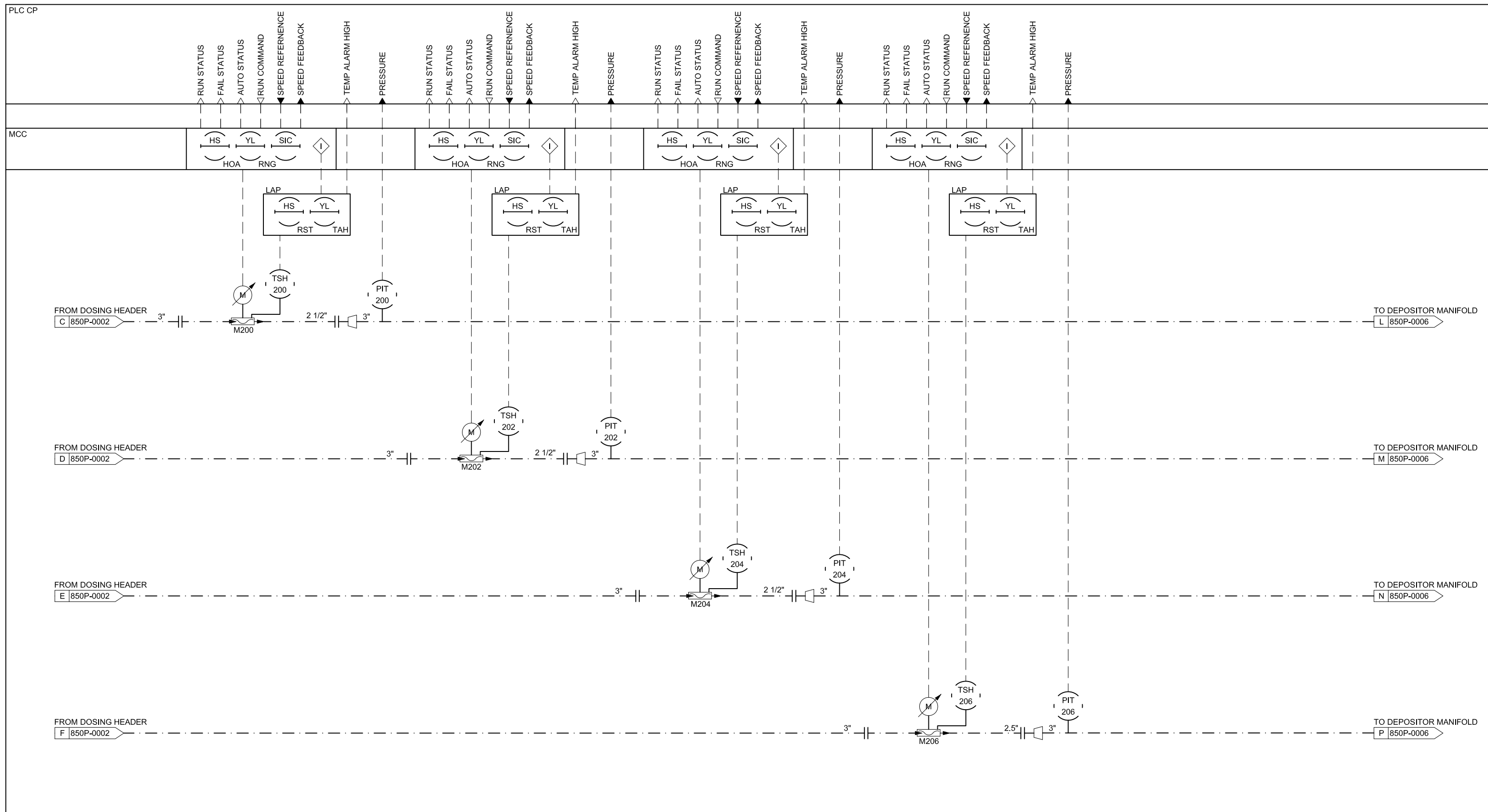
A	PRELIMINARY RELEASE	HJH	JJM	06.03.15
REV	DESCRIPTION	DRAWN	APPR	DATE

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BIOCON					
PIPING & INSTRUMENTATION DIAGRAM					
DOSING PUMP HEADER 2					
DRAWN	CHECKED	SCALE	DRAWING NO	SHEET	REV
HJH	JJM	1:2	850P-0003	1 of 1	A



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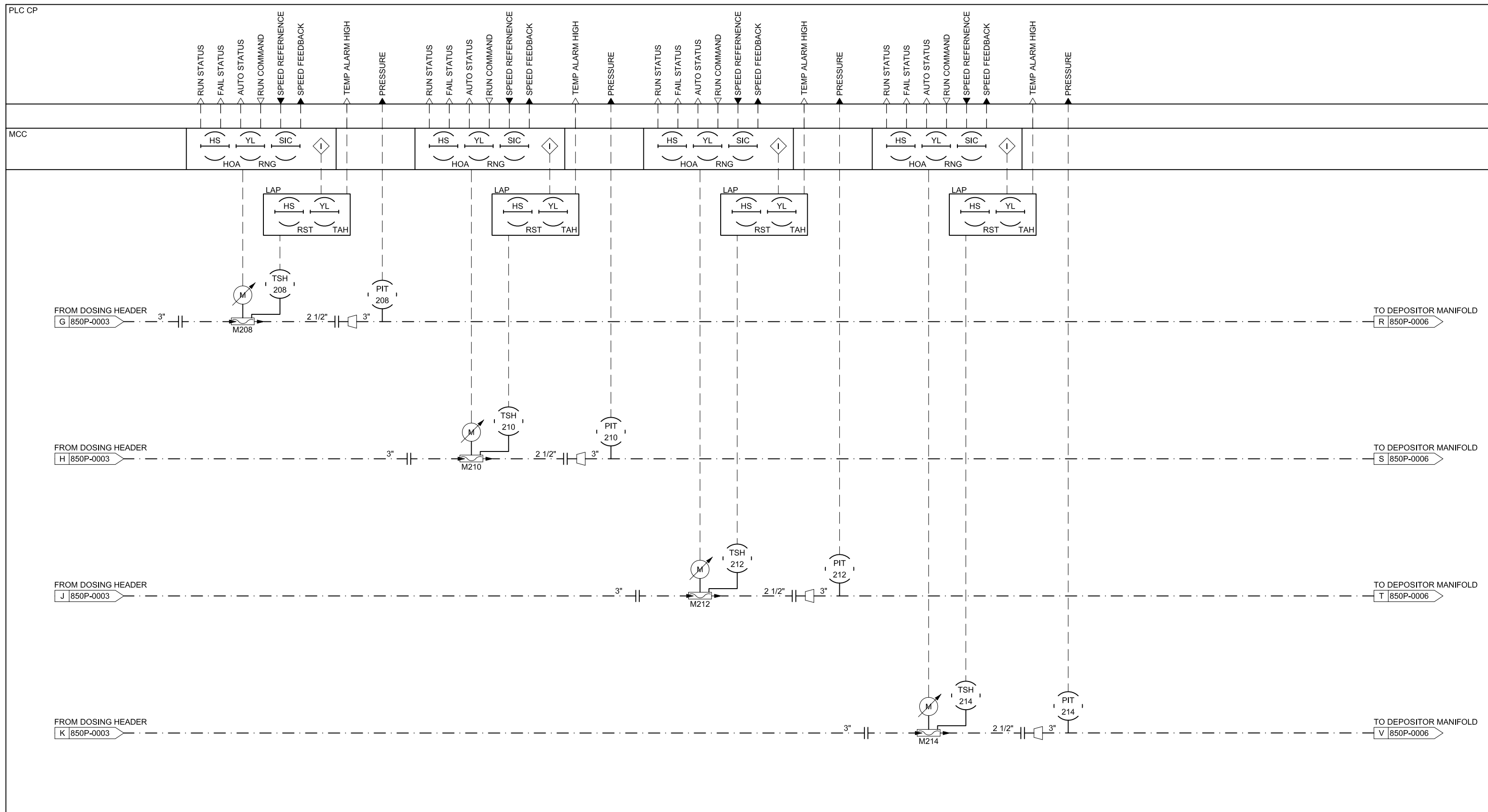
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BIOCON					
PIPING & INSTRUMENTATION DIAGRAM					
DOSING PUMPS (1-4)					
DRAWN HJH	CHECKED JJM	SCALE 1:2	DRAWING NO 850P-0004	SHEET 1 of 1	REV A

REV	DESCRIPTION	DRAWN	APPR	DATE
A	PRELIMINARY RELEASE	HJH	JJM	06.03.15



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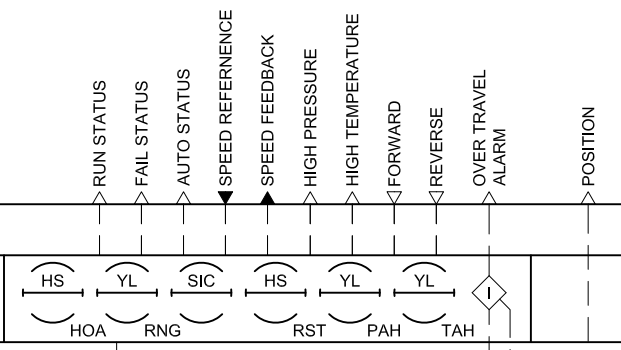
5700102402
 JUNEAU, AK

BIOCON					
PIPING & INSTRUMENTATION DIAGRAM					
DOSING PUMPS (5-8)					
DRAWN HJH	CHECKED JJM	SCALE 1:2	DRAWING NO 850P-0005	SHEET 1 of 1	REV A

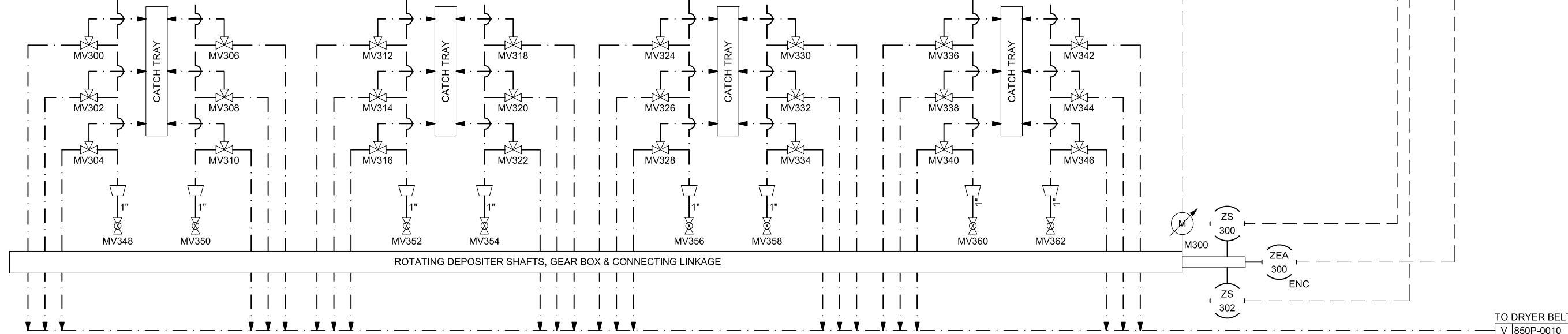
REV	DESCRIPTION	DRAWN	APPR	DATE
A	PRELIMINARY RELEASE	HJH	JJM	06.03.15

PLC CP

MCC



- FROM DOSING PUMP
L 850P-0004
- FROM DOSING PUMP
M 850P-0004
- FROM DOSING PUMP
N 850P-0004
- FROM DOSING PUMP
P 850P-0004
- FROM DOSING PUMP
R 850P-0005
- FROM DOSING PUMP
S 850P-0005
- FROM DOSING PUMP
T 850P-0005
- FROM DOSING PUMP
U 850P-0005



NOTES:

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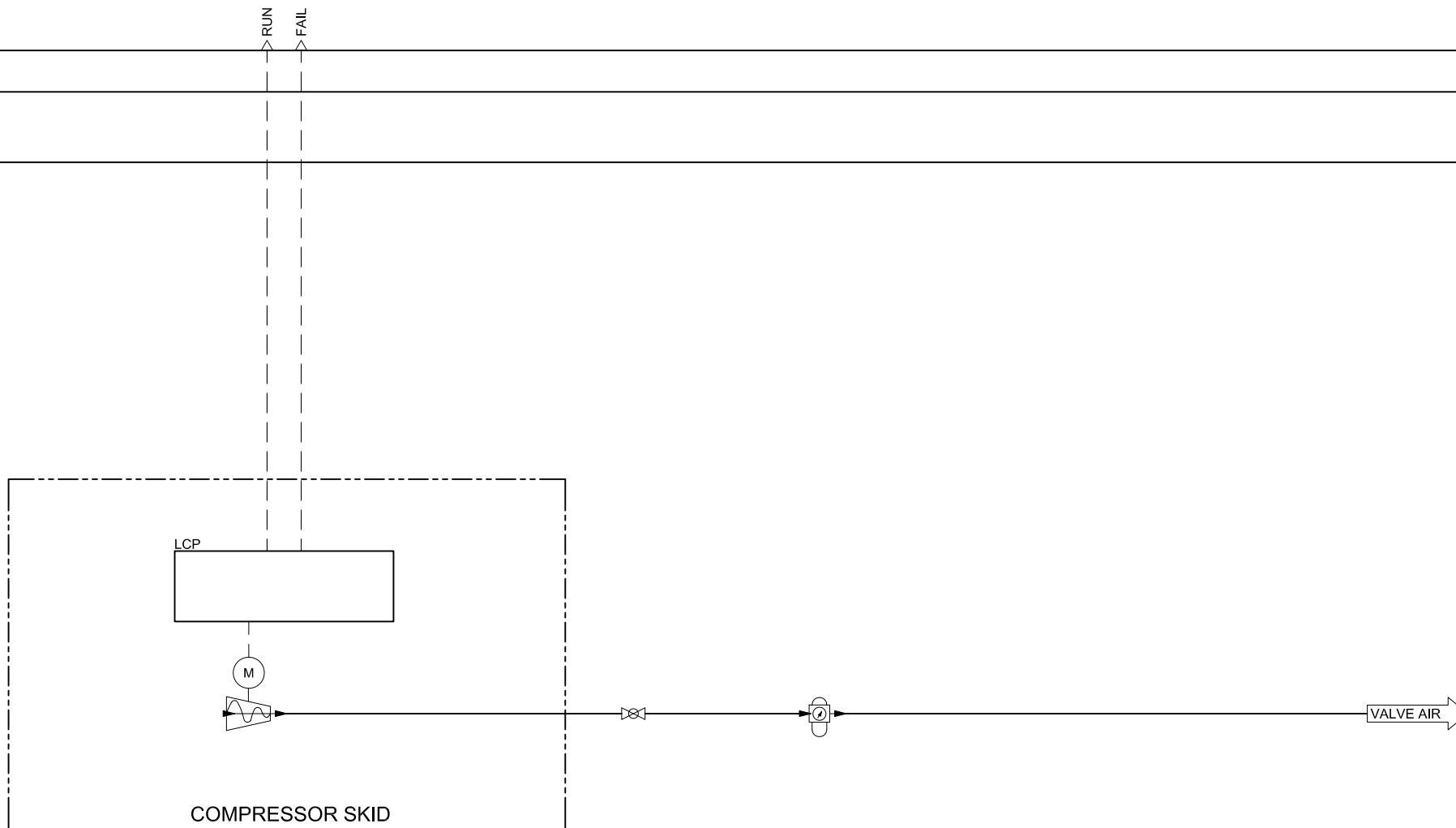
BIOCON
PIPING & INSTRUMENTATION DIAGRAM
DEPOSITOR MANIFOLDS AND SHAFTS

REV	A	PRELIMINARY RELEASE	HJH	JJM	06.03.15
		DESCRIPTION	DRAWN	APPR	DATE

DRAWN	CHECKED	SCALE	DRAWING NO	SHEET	REV
HJH	JJM	1:2	850P-0006	1 of 1	A

PLC CP

MCC



NOTES:

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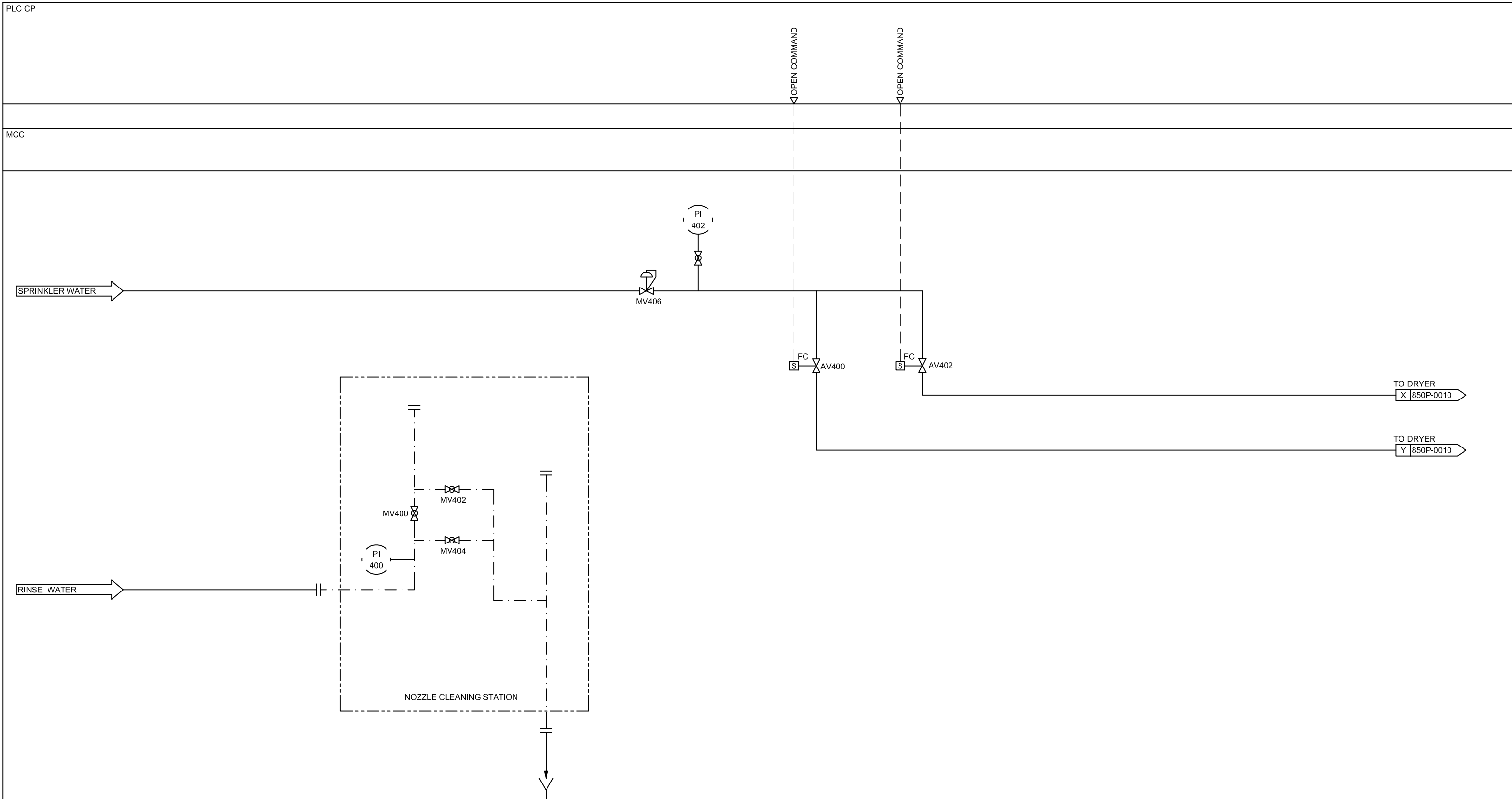
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BIOCON					
PIPING & INSTRUMENTATION DIAGRAM					
COMPRESSED AIR SYSTEM					
DRAWN	CHECKED	SCALE	DRAWING NO	SHEET	REV
HJH	JJM	1:2	850P-0008	1 of 1	A

REV	DESCRIPTION	DRAWN	APPR	DATE
A	PRELIMINARY RELEASE	HJH	JJM	06.03.15



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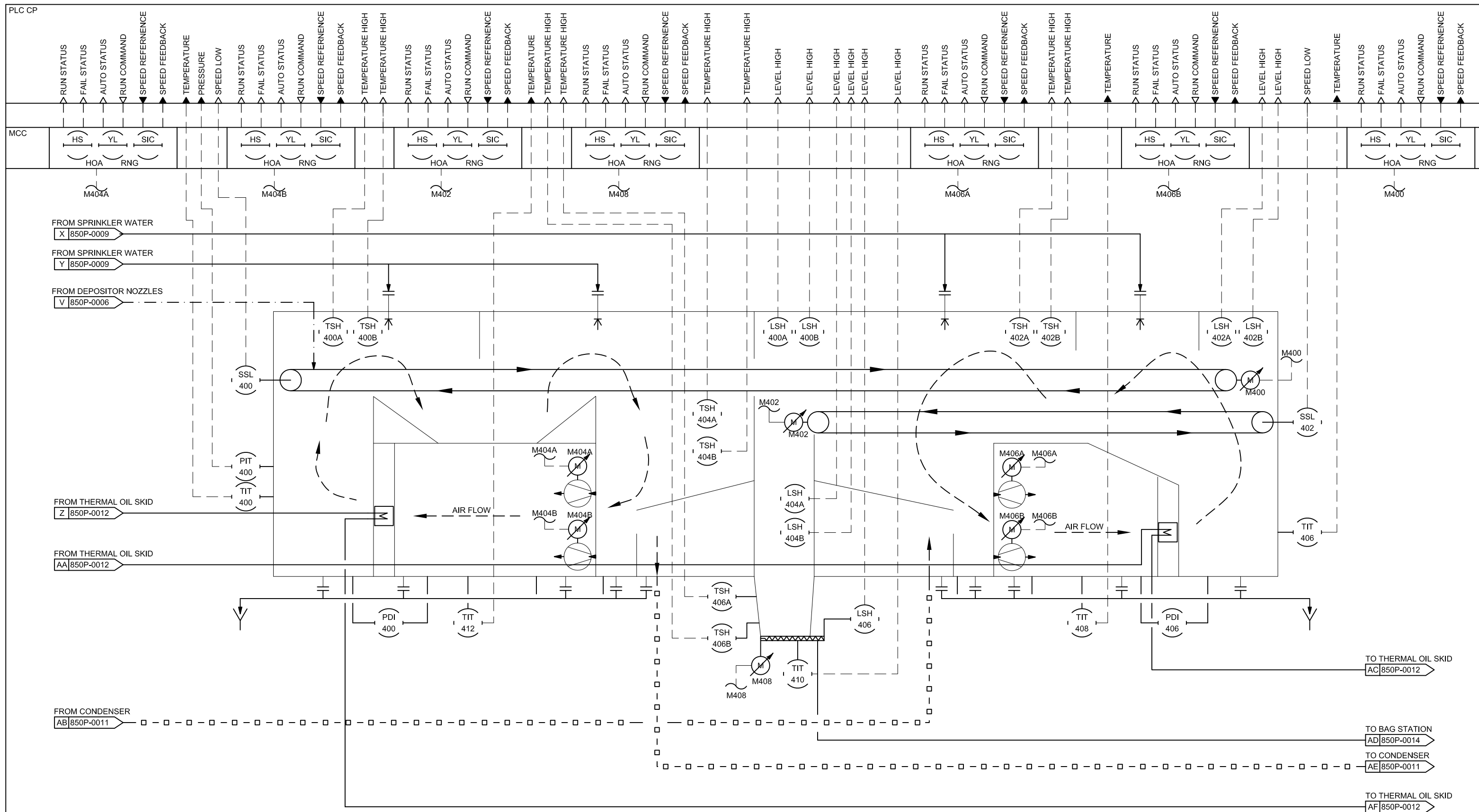
REV	DESCRIPTION	DRAWN	APPR	DATE
A	PRELIMINARY RELEASE	HJH	JJM	06.03.15

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 (919) 677-8310

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BIOCON					
PIPING & INSTRUMENTATION DIAGRAM					
NOZZLE CLEANING AND SPRINKLER WATER					
DRAWN	CHECKED	SCALE	DRAWING NO	SHEET	REV
HJH	JJM	1:2	850P-0009	1 of 1	A



- NOTES:
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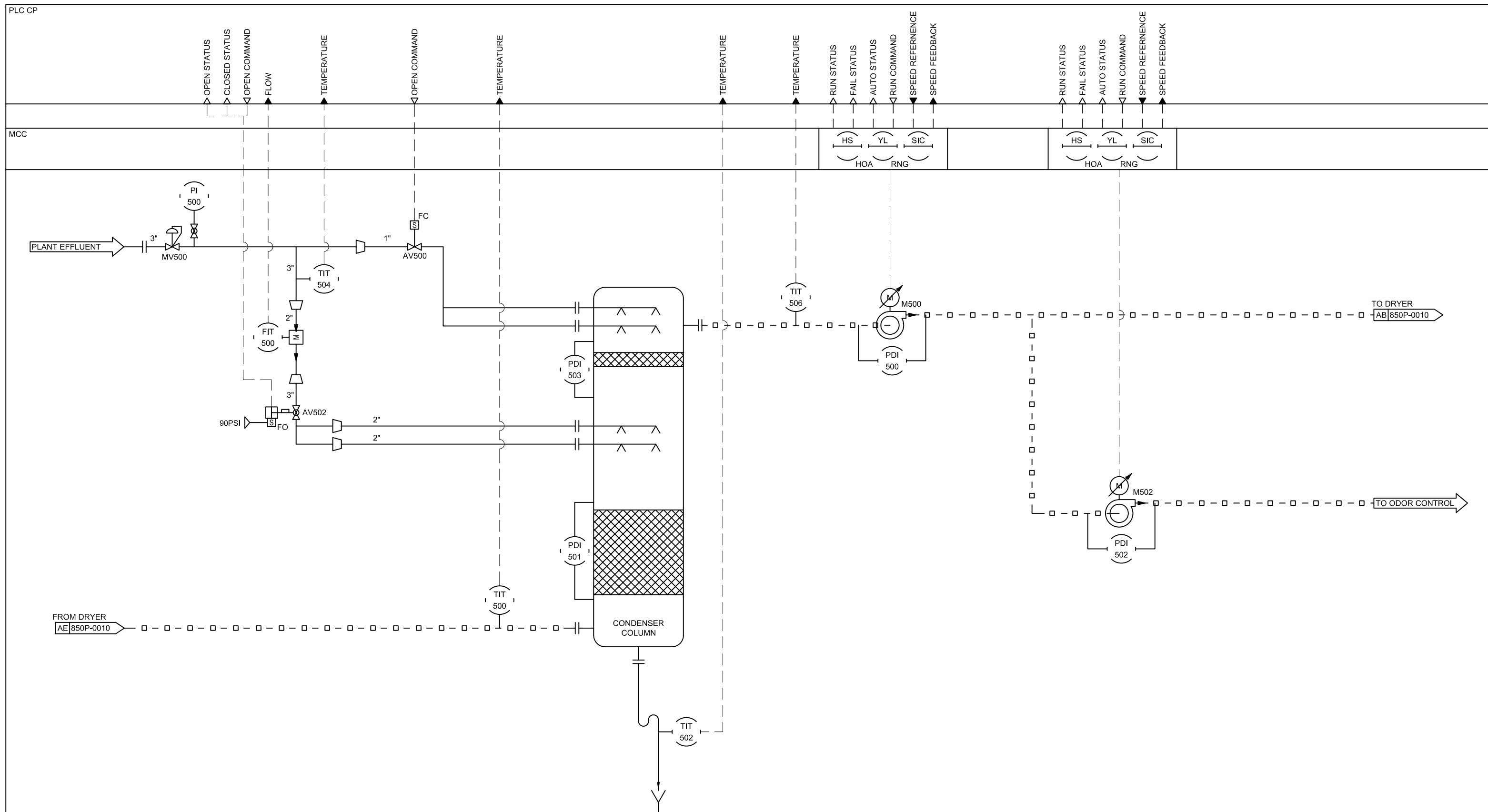
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BIOCON PIPING & INSTRUMENTATION DIAGRAM SLUDGE DRYER					
DRAWN HJH	CHECKED JJM	SCALE 1:2	DRAWING NO 850P-0010	SHEET 1 of 1	REV A

REV	DESCRIPTION	DRAWN	APPR	DATE
A	PRELIMINARY RELEASE	HJH	JJM	06.02.15



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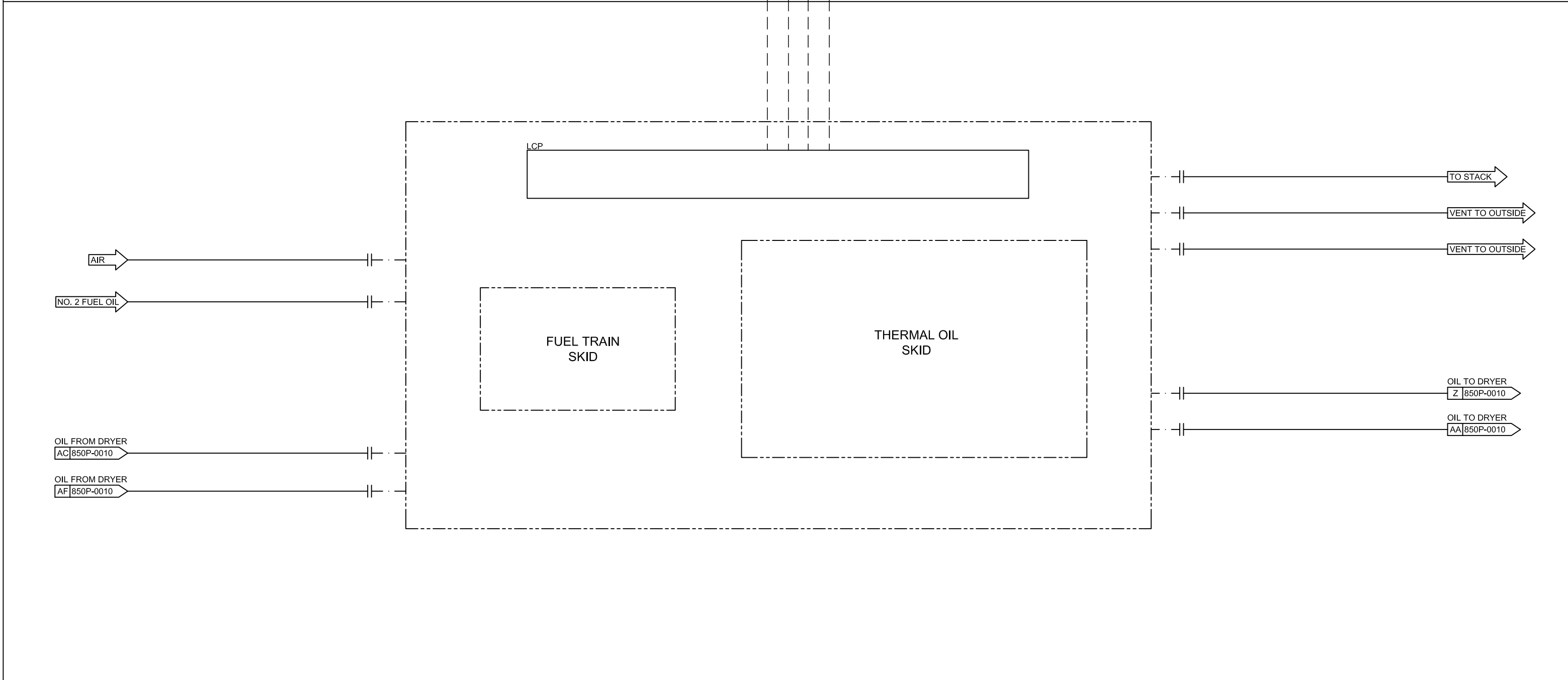
BIOCON					
PIPING & INSTRUMENTATION DIAGRAM					
DRYING AIR TREATMENT					
DRAWN HJH	CHECKED JJM	SCALE 1:2	DRAWING NO 850P-0011	SHEET 1 of 1	REV A

REV	DESCRIPTION	DRAWN	APPR	DATE
A	PRELIMINARY RELEASE	HJH	JJM	06.03.15

PLC CP

MCC

START/STOP
 RUN STATUS
 ALARM STATUS
 TEMPERATURE



- NOTES:
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REV	DESCRIPTION	DRAWN	APPR	DATE
A	PRELIMINARY RELEASE	SRW	JJM	06.03.15

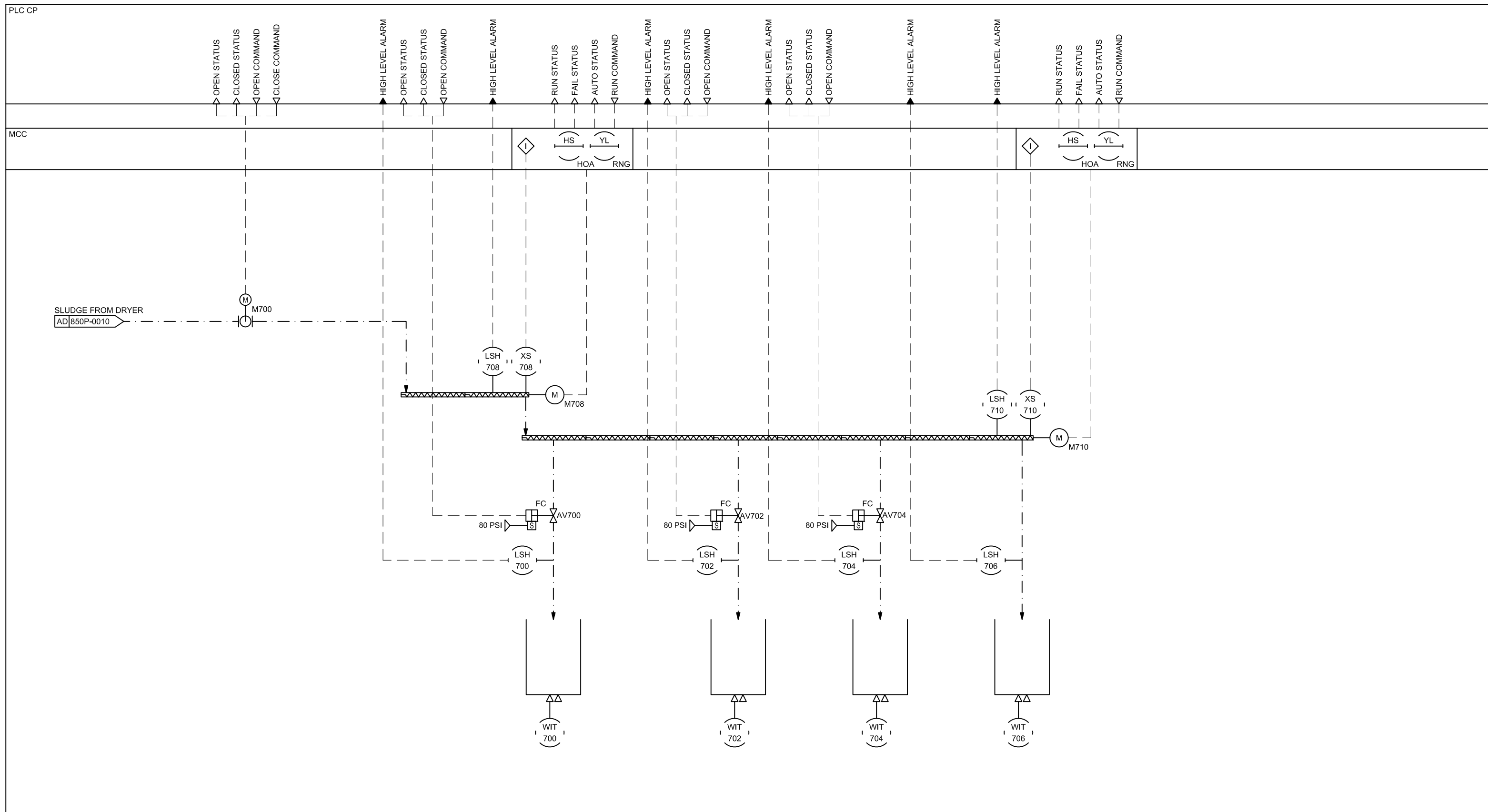
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BIOCON
 PIPING & INSTRUMENTATION DIAGRAM
 THERMAL OIL SYSTEM

DRAWN SRW	CHECKED JJM	SCALE 1:2	DRAWING NO 850P-0012	SHEET 1 of 1	REV A
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- NOTES:
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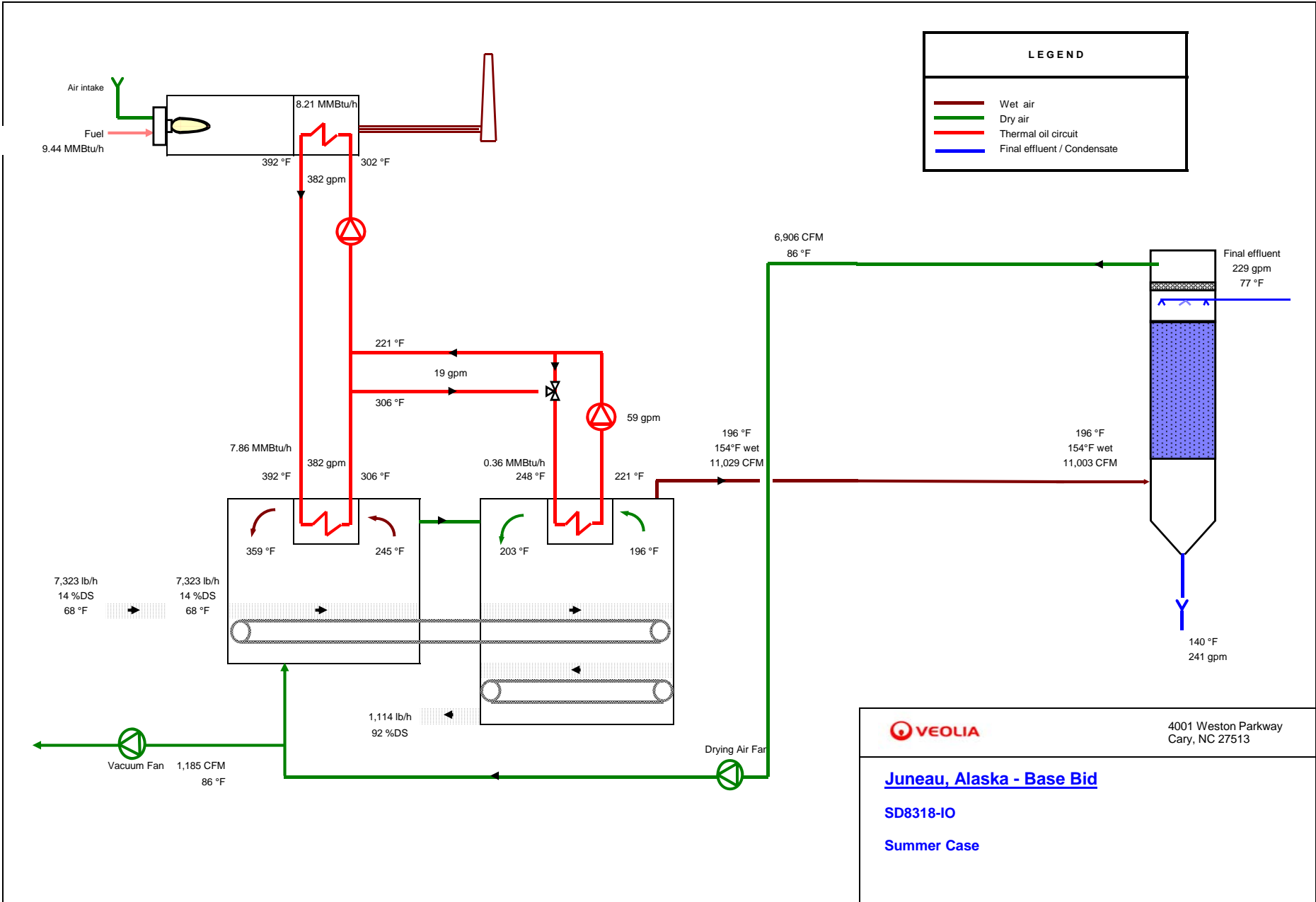
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CARY, NC 27513
(919) 677-4310

5700102402
JUNEAU, AK


BIOCON
PIPING & INSTRUMENTATION DIAGRAM
DRIED SLUDGE BAG STATION

REV	DESCRIPTION	DRAWN	APPR	DATE
A	PRELIMINARY RELEASE	SRW	JJM	05.14.15

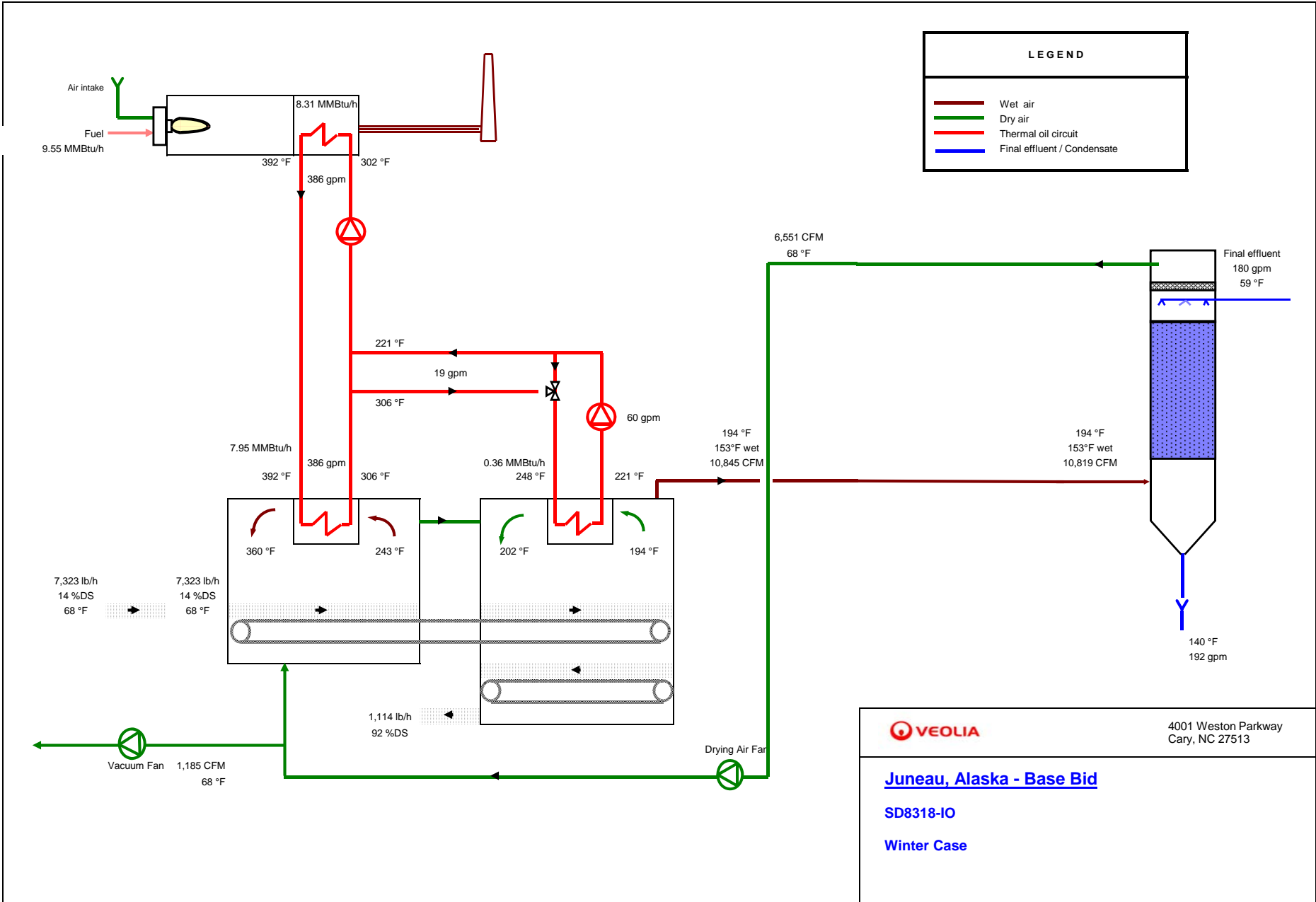
DRAWN	CHECKED	SCALE	DRAWING NO	SHEET	REV
SRW	JJM	1:2	850P-0014	1 of 1	A



LEGEND	
—	Wet air
—	Dry air
—	Thermal oil circuit
—	Final effluent / Condensate


 4001 Weston Parkway
 Cary, NC 27513

Juneau, Alaska - Base Bid
SD8318-IO
Summer Case



LEGEND	
	Wet air
	Dry air
	Thermal oil circuit
	Final effluent / Condensate

4001 Weston Parkway
Cary, NC 27513

Juneau, Alaska - Base Bid

SD8318-IO

Winter Case