



BID FORM A:

DO Sensor System Replacement

Return To: Madison Metropolitan Sewerage District 1610 Moorland Rd. Madison WI, 53713 Attn: Matt Seib	Title: DO Sensor System Replacement Date Issued: Tuesday, July 20, 2021 Project manager Matt Seib Telephone: 608-222-1201 EXT 209 Email: matts@madsewer.org
BIDDER:	Submit Bid by: 2 p.m. Tuesday, August 3, 2021 Today's Date: July 20, 2021

	Specification	Price Per Unit or Number	Total
1	DO Sensor System (see Attachments A & B for description)		

Lump Sum \$ _____

Company name: _____

Company address: _____

Company phone: _____

Authorization signature: _____

Printed name: _____

Addendum # _____

Bids will be received until 2 p.m., Tuesday, August 3, 2021

Date and time received: _____

1.0 PURPOSE AND SCOPE

The Madison Metropolitan Sewerage District invites and will accept bids for the purchase of DO Sensor System Replacement as specified in Attachments A and B. MMSD intends to use the results of this process to award and issue a purchase order for the winning bid as a lump sum.

2.0 CORRESPONDENCE, CLARIFICATIONS AND QUESTIONS

Bidders are expected to raise any questions, exceptions or additions they have concerning the bid document by *2 p.m., Thursday, July 29, 2021*. If a bidder discovers any significant ambiguity, error, conflict, discrepancy, omission, or other deficiency in this request for bid, the bidder must immediately notify the Project Manager named on the cover page of the issue in writing and request modification or clarification of the bid document. All inquiries must be directed to the person indicated on the cover page. E-mail is the preferred method of contact.

The District, at its sole discretion, may require oral presentations, product demonstrations and/or vendor location site visits to validate information submitted with the bids. Failure of a bidder to conduct a presentation on the date scheduled or allow an on-site/vendor site visit may result in rejection of the bid. These events cannot be used as an opportunity to alter bids submitted.

3.0 ADDENDUMS

In the event it becomes necessary to clarify any part of this request for bid, or to revise any part of this RFB, the Project manager will send out an official addendum/amendment to all potential bidders. Bidders must acknowledge the receipt/review of any addendum(s) on the Bid Form A.

The Project manager has the sole authority for modifications of this specifications and or bid.

4.0 BIDDER QUALIFICATIONS & REQUIREMENTS

All Bidder qualifications in this section are mandatory. Failure to meet a qualification may disqualify your Bid. However, the Procurement Agent reserves the right to waive any qualification if no Bidder is able to satisfy that qualification.

- 4.1 Bidder must be in the business of providing DO sensors and water quality monitoring equipment for at least the past three (3) years. (See Bidder Response Sheet Attachment C)
- 4.2 Bidder must be an original manufacturer, authorized distributor, or dealer authorized by manufacturer with service and repair capabilities for the items.
- 4.3 Bidder must provide a written warranty providing assurance that manufactured parts are in brand new condition and free of defects in quality or workmanship.
- 4.4 Bidder must be able to deliver equipment within 3-4 month of award.

5.0 METHOD OF BID

Bidder must use the Request for Bid form (Bid Form A) and must submit a Lump Sum, and guaranteed days from order placement to delivery. Bids will be accepted only for fixed costs as requested. All prices must be bid in U.S. Dollars. Bidder's own quotation sheet will not be accepted.

6.0 INVOICING REQUIREMENTS

Contractor shall invoice after materials are shipped. MMSD will pay or reject invoices within 30 days of receipt by MMSD. Only properly submitted invoices shall be officially received for payment. Thus, your prompt payment requires that your invoices be clear and complete in conformity with the instructions below.

All invoices must be itemized showing

- a. Purchase Order number
- b. Contractor name
- c. Remit to address and telephone number
- d. Contract price(s) and detail of what is being billed

7.0 METHOD OF AWARD

Award(s) shall be made on the basis of the lowest **lump sum bid** from a responsive, responsible bidder who meets all specifications. MMSD will award to one (1) Bidder whichever is judged to be in the best interest of the MMSD. MMSD is the sole determinant of its best interests.

Acceptance testing of a pair of universal controllers and terminal will occur prior to payment, order, and delivery of remaining equipment. Acceptance testing will be performed by the District and will consist of verification of the design requirements and performance for wireless communication. If the item/service does not meet design requirements or expected performance, the Contractor will have 15 days to meet requirements. If after this time period the item/service still does not meet design requirements or performance, the Contractor agrees to remove the items and return any payments that may have been made, and the overall bid will be rejected. The District has the sole right to determine if acceptable design requirements and performance have been met.



8.0 REQUIRED FORMS

In order for your bid to be considered, the following completed documents must be provided. An “X” preceding the form indicates that it must be completed and returned with the Bid response by the due date and time listed on the bid cover page, in order for your bid to be considered. Include:

X	Bid Form A, Cover (Signature) /Cost Pages	
X	Bidder Response Sheet	Attachment C

Failure to provide the required documents/information within your bid submittal may disqualify your bid.



BIDDER RESPONSE SHEET. RFB *DO Sensor System Replacement* ATTACHMENT C

Bidders must submit the following table with a response **in the form of a check** in one box for each criterion indicating “Yes” or “No”. A check indicating “Yes” certifies that the Bidder is fully capable of providing the service or qualification described. **Bids without a response for each requirement or “No” will be rejected.** Awarded vendor must be able to answer “Yes” to all requirements.

QUALIFICATIONS AND REQUIREMENTS

Section	Requirement Description	YES, I <u>can</u> meet this requirement	NO, I <u>cannot</u> meet this requirement
4.1	Bidder must be in the business of providing DO sensors and water quality monitoring equipment for at least the past three (3) years.	<input type="checkbox"/>	<input type="checkbox"/>
4.2	Bidder must be an original manufacturer, authorized distributor, or dealer authorized by manufacturer with service and repair capabilities for the items.	<input type="checkbox"/>	<input type="checkbox"/>
4.2	Bidder must provide a written warranty providing assurance that manufactured parts are in brand new condition and free of defects in quality or workmanship.	<input type="checkbox"/>	<input type="checkbox"/>
4.3	Bidder must be able to deliver equipment within 3-4 month of award.	<input type="checkbox"/>	<input type="checkbox"/>

Specify the Product Name and Product # (if applicable for the RFB response)

Product Name:

Product Number or Part Number

Madison Metropolitan Sewerage District



1610 Moorland Road • Madison, WI 53713-3398 • P: (608) 222-1201 • F: (608) 299-2129

I certify that the information I have provided in this bid is true, and I understand that any false, misleading, or missing information will disqualify the bid.

Company Name: _____

Bidder's Name and Title: _____

Bidder Signature: _____

Date: _____

Signature of authorized MMSD Employee:

Printed Name:

Date: _____



Attachment A: Specifications for DO Sensor System

1.0 PURPOSE

The Madison Metropolitan Sewerage District operates the Nine Springs Wastewater Treatment Plant, which consists of 10 plug flow activated sludge treatments trains spread across four plants, with each train using 2 dissolved oxygen (DO) sensors to control aeration (20 DO sensors across entire facility). Each individual sensing location is currently equipped with a DO sensor, transmitter, and air blast self-cleaning system with an individual air compressor. Each sensing location is equipped with a 120 V power supply. The existing sensors are obsolete and at the end of useful life, so the District is planning to replace all 20 DO sensors with new sensors.

The District is planning to replace its DO sensing technology with a water quality monitoring platform that provides flexibility, has ability to accept multiple sensing parameters, and can easily be integrated into existing District facilities. In particular, the District is interested in a technology platform that utilizes a multi-parameter universal controller that can control, indicate, record, and transmit signals from multiple online sensors and be able to communicate wirelessly between multiple sensor locations. The District also wishes to continue using the existing air-blast cleaning compressors, so the proposed system must control these compressors.

2.0 SCOPE

1. Provide a proposed system design to meet the intended DO sensor replacement objective.
 - a. Include drawings, itemized list of major components and accessories, and specifications for each of the three sensor networks described in section 3.0 System Description that illustrate and specify functional and general construction requirements of universal controllers and associated networks but do not necessarily show or specify all components, wiring, piping, and accessories required to make a completely integrated system. (A facility diagram intended to aid in system and individual sensor network design is included in Appendix B. This diagram shows the approximate location of each sensor location and connection points with the facility process control system).
2. Provide a pair of universal controllers and a terminal for evaluation. The purpose of this evaluation is to trial the wireless communication capabilities of the controllers and verify that the controllers do not experience signal interference from other sources at the facility as well as confirm that the controllers do not create signal interference for other wireless communication devices at the facility. Additionally, the evaluation will be used to confirm that the controllers can effectively communicate across the distances desired at the facility. This evaluation will be conducted at various locations at the facility. The bid will be considered unacceptable if wireless interferences are detected that District staff deem to be

unacceptable. The District has the sole right to determine acceptable performance and reject any proposed equipment.

3. Furnish all components for complete and integrated process monitoring and control networks, and manufacturer documentation/manuals for each component. Include a spare parts list that shows an itemized list of all provided components along with component pricing and estimated component delivery time.
4. Provide assistance and training for equipment installation, configuration, startup, and validation. (District staff will install all equipment and provide integration of sensors/sensor network with the existing process control system.)

3.0 SYSTEM DESCRIPTION

The system will consist of three independent sensor networks, with each network having its own controller(s), power supply(s), DO sensor(s), relays(s), accessories, communications hardware, etc. as required. One network will serve Plant 1 activated sludge trains and will consist of six DO sensor locations and one connection point into the plant process control network. One network will serve Plant 2 activated sludge trains and will consist of six DO sensor locations and one connection point into the plant process control network. The last network will serve Plants 3 and 4 activated sludge trains and will consist of eight DO sensor locations and one connection point into the plant process control network. Each sensor location must include a DO sensor and necessary hardware to support a DO sensor, control of the existing air burst compressor, sensor air burst cleaning, and wireless communication. Hardware at each sensor location must also have capacity to accept at least one additional sensor in the future and/or ability to easily expand the hardware at each location to accept additional sensors. Each connection point into the plant process control network must include hardware to allow Ethernet IP communications with the process control network and wireless communication to each sensor in the respective network.

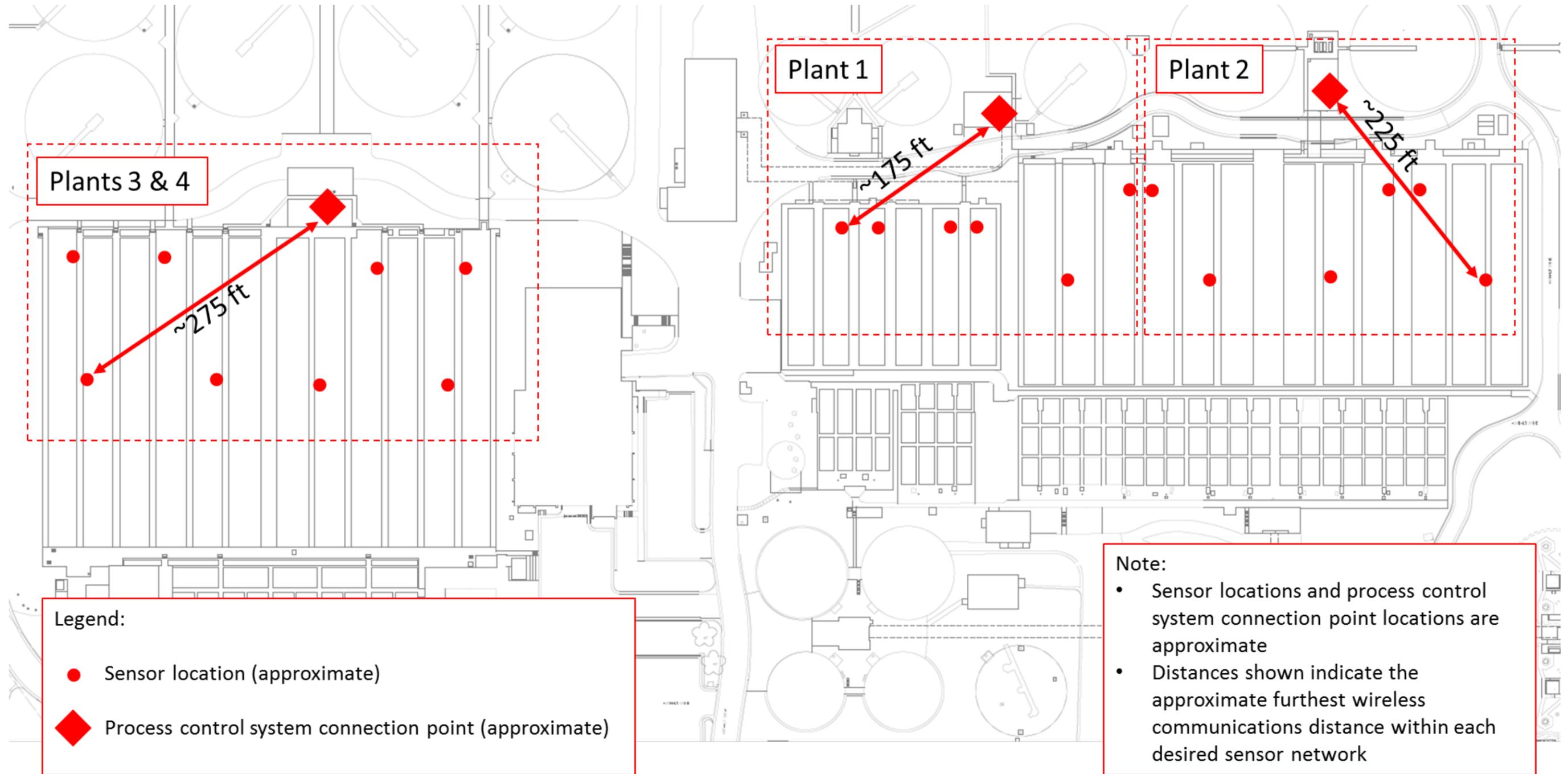
4.0 DESIGN REQUIREMENTS

1. Provide all system products from the following manufacturer:
 - a. YSI Incorporated, 1700/1725 Brannum Lane, Yellow Springs, OH 45387.
 - b. Equivalent.
2. System products must be designed for operation outdoors in the climate conditions experienced at the facility. The system must be designed to perform without detrimental interference in various weather conditions such as high humidity, rain, snow, icing, or localized elevated temperature due to equipment exposure to direct sunlight.
3. Specific process monitoring and control features for each individual network within the overall system must include:
 - a. A modular water quality monitoring universal controller system for continuous operation outdoors.
 - i. Universal controllers shall stack-mount to any expansion module in the network by means of a simultaneous mechanical/electrical connection.

- ii. Universal controller system components shall be designed to be part of a network that has the following capabilities and features:
 - 1. Enhanced protection against overvoltage due to lightning and power supply fluctuations according to EN61326 when installed using manufacturer's recommended components per manufacturer's instructions.
 - 2. Powered from a single centralized power supply.
 - 3. 24VDC loop powered communication.
 - 4. Communications interface: Ethernet [RS485].
 - 5. Modular: Network shall be expandable in a way that additional sensors, up to a total of 20 sensors per controller, and expansion modules shall have full functionality from any location in the network without a requirement to remove or physically modify the universal controller.
 - 6. Line, tree, star, and multiple star topology.
- iii. Universal controller system shall accept sensors for multiple parameters including, but not limited to:
 - 1. Dissolved oxygen.
 - 2. Ammonium.
 - 3. Nitrate.
 - 4. Nitrite.
 - 5. NOx.
 - 6. TSS.
- iv. Performance Requirements
 - 1. Temperature: -4°F to 131°F (-20°C to 55°C).
 - 2. Relative humidity: less than or equal to 90% (yearly average).
 - 3. Altitude: less than or equal to 6,562 ft. (2,000 m) above mean sea level.
 - 4. Automatic air pressure compensation.
- b. A multi-parameter terminal that is portable within the network by connecting to any expansion module in the network by means of a simultaneous mechanical/electrical connection.
 - i. Backlit display.
 - ii. Datalogger with total storage up to 525,600 measurements in csv format and user programmable logging interval ranging from 1 to 60 minutes.
 - iii. USB-A port.
 - iv. Menu-driven operating system.
 - v. Control 1 to 20 sensors.
- c. Ability for universal control modules to communicate wirelessly within the network.
 - i. Radio transmission Class 1; 2.4 GHz ISM band with a maximum range of 100 m (328 ft).

- ii. Universal control module software must include signal diagnostics, monitoring, and alarm features.
- iii. Control modules must be able to communicate wirelessly without unacceptable interference from other signals at the facility and must not create unacceptable wireless signal interference to other wireless communication devices at the facility.
- d. Dissolved oxygen measurement system for continuous monitoring *in situ*.
 - i. The sensor shall have integrated NTC thermistor.
 - ii. The sensor shall use green LED light with fluorescing optics and equal path reference system.
 - iii. The sensor shall not require calibration. Replacement sensor caps shall contain a built in microchip, not requiring field calibration upon installation.
 - iv. The sensor shall include self-diagnostics for monitoring of membrane sensing element function.
 - v. The sensor output signal shall be digital.
 - vi. The sensor shall detach from sensor cable allowing for easy replacement or repair.
 - vii. The sensor shall be designed to be nonincendive and nonarcing.
 - viii. Sensor measuring range shall be 0.00 to 20.00 mg O₂/l; 0 to 200% of DO saturation.
 - ix. Sensor measuring accuracy shall be:
 - 1. ± 0.05 mg O₂/L in the range less than 1 mg O₂/L.
 - 2. ± 0.10 mg O₂/L in the range greater than 1 mg O₂/L.
 - x. Sensor repeatability shall be ± 0.05 mg O₂/L.
 - xi. Sensor resolution shall be 0.01 mg O₂ / L (0.1%).
 - xii. Sensor response time shall be 90 percent of the final (true) reading (t₉₀) in less than 150 seconds and 95 percent of the final (true) reading in less than 200 seconds.
 - xiii. Sensor shall have a signal averaging option that is user selectable to provide a t₉₀ from 150 seconds to 300 seconds.
- e. Accessories
 - i. Include cleaning head modules for use with compressed air for all dissolved oxygen measurement sensors.
 - ii. Include handrail-style mounting hardware for the dissolved oxygen measurement sensors and universal control modules that are to be deployed at the aeration basins.
 - iii. Include wall mounting hardware for universal control modules that are to be deployed at the connection points into the plant process control network (i.e. no DIN rail or handrail mounting).
 - iv. Include plastic sun shields for the universal control modules that are compatible with the wireless communication technology.

Attachment B: Facility Diagram



Plants 3 & 4

Plant 1

Plant 2

~275 ft

~175 ft

~225 ft

Legend:

- Sensor location (approximate)
- ◆ Process control system connection point (approximate)

Note:

- Sensor locations and process control system connection point locations are approximate
- Distances shown indicate the approximate furthest wireless communications distance within each desired sensor network