

March 22, 2018

**Specification Clarification I**

**Request for Proposal #218-42**

Grand Valley State University (GVSU) has issued the follow specification clarification for request for proposal #218-42.

System to have an open frame design to allow maximum visibility without sacrificing structural integrity. An onboard water delivery and drainage system easily removable for cleaning and maintenance. Water flow to be precisely metered by individual valves, allowing a variety of flow rates to individual tanks. Drain troughs and piping are to be constructed from clear PVC for convenient monitoring of waste water flows, algae build-up, fouling, etc.  Probes to include pH, temperature, conductivity, dissolved oxygen, water level, and a sixth sensor open for later add-on.  System to include level sensor and flow sensor for safety and shut-down of electrical components in the event of a low water or low flow situation.  Photoperiod control. 1.5L tanks (capable for expansion to larger tank sizes), five to six rows. Tanks must be FDA approved, cage washable and autoclavable. Must have two to three stage filtrations plus UV/Ozone sterilization capable.  Must also have system to control heat (i.e. heater) and chiller.

**Additional Specifications needed:**

**Support Rack**

Tubular stainless steel support rack with leveling feet, powder-coated

1.5L tanks, 5 to 6 rows

Photoperiod control

**Advanced Controller**

Programmable Logic Controller w/ Touchscreen Display

Monitoring for pH, temperature, conductivity, dissolved oxygen, water level, and one spare

Pump shut off with alarm indication in the event of low water level condition

UV/Ozone sterilizer and heater/chiller combination programmed to shut off in the event of a pump shut-down

Programmable water exchange

Remote Monitoring Capability with Email and SMS Alert

Dry Contact for Dial-Out Device Integration

Data Logging

Event and Maintenance Logging

Graphical Display of Parameters

Web Dashboard Access from Any Internet Device

**Water Flow Control**

Quiet-running, energy efficient water pump

High quality, fine adjustment ball valve with on/off flow control to each tank

Pressure relief valve prevents flow variation on system during tank flow adjustment

Emergency by-pass feature allows full flow to continue to culture tanks during service or repair

Water access valve for supplemental system water use

**Polycarbonate Tanks**

FDA approved clear polycarbonate tanks

Blue-tinted polycarbonate lids and baffle inserts to reduce algae growth

Cage washable (82.2 C°) and autoclavable (121 C°)

Tank form and baffle insert provide self-cleaning flow design for removal of settleable solids

Easily removable with molded feet for securing into position on racks

Tank positions on racks allow access within tanks while tanks are on the rack

**Recirculating Filtration**

First stage mechanical filtration: 120-micron filter pad

Second stage mechanical filtration: 50-micron filter cartridge

Combined moving and submerged-bed biological filtration (over 90 m2 of surface area)

Over-sized biological filtration capacity

Activated carbon to adsorb volatile organics and other contaminants and optimize water clarity

UV/Ozone disinfection

Heater/Chiller

Bid Opening: Tuesday, April 17, 2018 @ 10:00 AM

Thank you for your participation,

Valerie Rhodes-Sorrelle, C.P.M.

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