

DECONTAMINATION UNIT MINIMUM STANDARDS

WRP Decontamination Think Tank Committee Final April 2, 2019

Checklist for Determining Viability of On-Demand Tankless Water Heater Decontamination System

Electrical Connection			
Does The Location Have Access to an electrical connection?	Yes	No (Electrical Connection Required)	
Fuel Source			
Does the Location Have Access to Fuel Source?	Yes	No (Fuel Source Required)	
Type of Fuel Available At Location?	Propane	Natural Gas	
Water Source			
Does the Location Have Access To Water Supply?	Yes	No (Will Require Section 7 of RFP)	
Water Flow Rate From Proposed Water Supply? (GPM)		GPM	
Recycling & Filtration System			
Is a Recycling & Filtration System Required?	Yes	No (Will Require Section 8 of RFP)	
Enclosure (Building)			
Does The Location Have Suitable Enclosure To House Units?	Yes	No (Will Require Section 9 of RFP)	

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OBJECTIVES:

[XXX] seeks proposals from qualified manufacturers/distributors to supply a decontamination unit, or similar technology, including any associated equipment and maintenance necessary to decontaminate watercraft.

The primary needs of the program include acquiring the necessary equipment to conduct decontaminations of watercraft with the following criteria:

- Decontamination of watercraft is achieved using hot water, up to 150°F;
- Water is heated to 120-150°F and pumped to conduct the decontaminations
- Operable for up to 16 hours per day;
- Sturdy construction that is weather resistant, efficient and easily maintained.
- Ability to safely operate by staff without special certifications.
- Components of the unit shall be durable, while considering ease of maintenance, replacement, and efficiency.
- Refer to [Uniform Minimum Protocols and Standards for Watercraft Inspection and Decontamination Programs for Dreissenid Mussels in the Western United States III](#) as a regional guidance document for decontamination procedures and recommended equipment.

DESIRED SPECIFICATIONS, REQUIREMENTS AND OBJECTIVES:

The successful proposal includes equipment with the following specifications and requirements (more than one type/model of equipment may be submitted for consideration):

1. **General system-** The system operates for extended periods daily and long-term use under varying weather conditions.

Specifications:

- Select non-corroding materials that meet or exceed ASME standards for application and satisfy the specific requirements in each section within.
- Provide a minimum of two hoses (one low pressure/high volume and one high pressure) capable of operating at full capacity for up to 16 hours a day. (Number of hoses and length of day is scalable)
- Design the unit to expel exhaust from equipment.

Considerations:

- Decibel levels below the OSHA Standard exposure threshold for 10-hour work days.
- Design the system to facilitate easy understanding of the design, movement within, repairs, maintenance and safety.
- Design the system to allow for the opportunity to uniquely customize, update, and improve the system as technology changes.
- Design the system to allow scheduled maintenance to occur during business hours; allowing portions to be deactivated and maintained without shutting down the entire system.
- The power requirements depend on the design of the system.
- Certify all applicable safety standards as necessary by Nationally Recognized Testing Laboratories (NRTL), such as UL or ETL certifications. (Note: certification may cost money)
- Securely fasten all equipment, plumbing fixtures, piping and electrical switches, receptacles, junction boxes and conduit installed within the enclosure; in such a way to prevent personnel injury or interference with operation or maintenance.
- Identify fuel sources when choosing equipment.

2. **Heating Systems-** For this RFP, heating systems are referred to as “heaters.” **Include the correct number of heaters in the design to operate the number of hoses of the decontamination unit so that a single heater failure will not disable the entire unit.**

- Heaters shall employ appropriate measures for safe use and prevent burning if touched.
- Heaters shall activate in conjunction with trigger operation through a flow-switch and not a pressure switch.

Low-Pressure/High-Volume Heaters-

Specifications:

- **[Specify how many hoses you need to operate.]**
- Utilize On-demand (tankless) water heaters.

- Maintain a constant operator-defined temperature at the trigger between 120°F and 150°F while variable flow rates are used, regardless of the source water temperature.
- Temperature variance while in use shall be no more than +/- 5°F.
- Design to easily set to desired temperatures utilizing digital thermostat controls.
- Temperature change increments at a maximum of 5 degrees.
- Design to operate at full capacity for long periods. Pump components (e.g. unloaders, flow switches, fuel solenoids, etc.) shall be engineered to handle, short, frequent bursts of the trigger.
- Condensate or by-product shall be neutralized prior to discharge.

Considerations:

- If you have the need to simultaneously run high & low pressure, additional heaters may be necessary. Simultaneous operation will also require increased incoming flow rate.
- Would like to see temperature adjusting in increments in 1 degree increments

3. Pumps and Capacity-

Specifications:

- High-pressure heater pump capacity of 5GPM at the trigger (without pressure fitting) and a pressure rating of 3000psi using a 40° pressure tip.
- The high pressure pump shall be rated for incoming water temperatures up to 160°F.
- Specify how pump is powered. Electric or Gas.

Considerations:

- High-volume pump pressure range of 60-100 psi after adjustments for altitude.
- Pumps supplying water to the low-pressure/high-volume heater systems shall be sized appropriately so that a minimum of 5GPM is seen at each of the low-pressure/high-volume triggers under full load.
- Heater coil plumbing sufficiently sized to not restrict water flow.
- Meet capacity by avoiding bottlenecks, considering the coil diameter and length, hose run, quick connects, and trigger when providing projected output.
- If utilizing a live water connection a low pressure pump is not necessary.

4. System Output- [identify number of hoses needed]

Specifications:

- Set up all hoses with identical 3/8" or 1/2" stainless steel quick connect fittings at the terminals.
- Hose Reinforced, non-marking and temperature rated to at least 200°F.
- Include 200 psi or greater, low-pressure/high volume hoses and 5000 psi high pressure hose.
- 50-foot hose lengths.
- The pumps for on-demand systems shall turn off when the trigger is released and turn on when the trigger is activated if present
- Pump for high pressure unit shall include bypass pump protection such as an unloader to reduce load on pump, hose and trigger.

- Each hose requires a properly sized trigger assembly ergonomically designed and capable of long-term use.
- High-volume trigger assemblies shall have an on/off control and consider heat transfer, ease of use, longevity, & safety.

Considerations:

- Properly size hoses for volume and pressure requirements, according to the specifications listed above in “Pumps and Capacity.”
- Auto-retractable reels.
- Construct a rack to mount the hose reels if it facilitates efficiency.
- On/off switch and a temperature control for high pressure unit on or near the hose reel rack.
- Temperature and flow control for on-demand units on or near the hose reel rack.
- Have a lock-open (e.g. quarter turn ball valve) function to allow water to flow while flushing engines. (If at all)
- Use meter to indicate time or gallon usage to aid in determining appropriate maintenance intervals.

5. Winterization of Equipment-

Specifications:

- Design the system to facilitate winterization of components (drain plugs, blow-out and addition of antifreeze).

Considerations:

- Include a stand-alone space heater. Include variable thermostat and direct the exhaust outside the unit. The heater is used to prevent freezing, as the decontamination unit may be used periodically throughout the winter.
- Design the system to have long periods (several months) of down time in which no power will be provided.
- Self Protection from freezing.

6. Water supply- Design the system to supply necessary flows described in “Pumps and Capacity.”

Considerations:

- Employing agency should consider the following tests of their water supply prior to installation:
 - Hardness
 - Pressure & Flow Rate
 - Source water temperature to determine heat rise necessary
- Employing agency may also consider pre-filtering water prior to introducing water in to the system

7. Water source tank-

Specifications:

- The source tank(s) shall be upright and have a cone bottom. It shall have a top opening of no less than 16" in diameter.
- Use an air gap or Reduced Pressure Backflow Assembly (RPBA) to prevent contamination of the water supply.

Considerations:

- Allow space between the tank and ceiling to allow cleaning with a pressure washer.
- Develop a system to sanitize and/or filter the source tank to limit algal or bacterial growth. Non-chemical injected sanitation systems such as UV light, filtration, and ozone are preferred options.
- A selector switch or exterior port to supply outside water source to the high-pressure system directly, allowing use of the pressure washer while the system is empty.
- Allow the source tank to be filled by a transfer pump through an exterior mounted camlock fitting.
- Design to require infrequent water exchanges. Allow the complete draining through an exterior mounted camlock fitting using a trash pump to siphon water out.
- Include an alarm system, indicating high and low water levels to prevent flooding or damage to equipment.

8. **Recycling and Filtration System**- The objective of this process is to reclaim, filter and resupply the water used for decontaminations. The first part is vacuuming/pumping water from the containment mat(s), then settling/filtering and lastly pumping to the source tank. Include plumbing to receive water from the containment area before treating and returning to the source tank. The system shall be developed to address the following factors:

Vacuum/Pump for Containment Mats-

Specifications:

- One vacuum or pump per containment mat, including suction hoses.
- Supply a pump to transport water from the containment mats to the recycling system.
- The vacuum/pump shall be appropriately powered to remove and transport water at a rate equal to the output.

Considerations:

- Preferable to have the vacuum/pump turn on/off automatically with the presence of water.
- If pumps are used to reclaim water from the containment area, include an additional vacuum with 30-foot 1.5" suction hose to remove water from watercraft.

Filtration System-

Specifications:

- Provide filtration of 20 microns or better to the source tank.
- The rate of reclamation and filtration shall be greater than the GPM output rate of the combined hoses. Normal degradation and/or blinding of the filters shall not impede this rate.
- Incorporate automatic backwash operation.

- Provide an annual operation cost, if consumables are used within the process.
- Include replacement schedule and costs for filtration components (e.g. replacement filters).

Considerations:

- Conduct an effluent chemical analysis to determine appropriate filtration requirements.
- Filter out sediment, road debris, sand, emulsified hydrocarbons (gas, oil, diesel), antifreeze, etc.
- Address organic growth, either before, or within the source tank.
- Chemical filtration or flocculation is discouraged due to expense and logistics of storage and disposal.
- If chemicals are part of the design, ensure the chemical will not damage personal gear (e.g. life jackets), the watercraft, or the internal components of the engine. Employees will have extended and repeated exposure to chemical laden water. A small amount of the treated water could remain in the watercraft systems and be introduced into the lake. Include the Material Safety Data Sheet for any chemical proposed.

9. Enclosure to house equipment-

Specifications:

- Weather-proof, secure (prevent tampering when staff are not present), self-contained and sturdy to facilitate transportation if necessary.
- Door/s should accommodate human entry as well as facilitate movement of equipment.
- All wire rated for a minimum of 25 amps.
- Include Ground Fault Interrupter (GFI), Arc Fault Interrupter (AFI) or combination safety outlets and circuit breakers as appropriate.
- Include overhead lighting.
- Compliant with local/regional building codes including ground snow loads.

Considerations:

- Include an electrical breaker box that is over sized to allow for growth and the addition of several new circuits over time.
- Adequate space to store other operational equipment and tools while not in use (e.g. hand tools, tool box, hoses, vacuum systems, etc.).
- Length is dependent on internal components, ensuring easy maneuvering within, facilitating maintenance and repairs, and site-specific needs.
- Design for transportation on a standard semi-truck trailer, lifted by a fork lift, large cargo handling equipment or sling lifted by a crane. Supply it with “pick points” at all four corners for lifting and hoisting.
- Thermally insulate on all sides, ceiling, floor and doors. Include a projected R-value.
- 20 Amp outlets on two dedicated circuits shall be strategically placed throughout the unit to accommodate use of external equipment (ex: tools, vacuum/pump system for water retrieval from the containment mat).

- Incorporate a utility hub opening where internal plumbing connections are terminated for interface with the site provided connections. These connections include water supply, fuel connection and wastewater feed.
- If a temporary structure, use quick connections for water and power.
- Allow the complete draining through an exterior mounted 2” camlock fitting using a trash pump to siphon water out.

Deliverables:

1. Complete system constructed and ready for transport [insert date]. Include a bid for transport and installation.
2. Training and support to be provided at time of delivery and set up.

Minimum Required Proposal Contents:

The proposal shall address the following items:

1. Definition of the Project: Indicate your understanding of the objective of constructing a decontamination unit and how it will operate given the environmental and operational constraints stated in this RFP.
2. Specifications: Indicate how the system proposed will meet the specifications that are desired as part of this RFP. Ensure each of the items under Desired Specifications, Requirements and Objectives are addressed in an organized manner. [*suggest requesting a certain format to one can compare the RFP with the proposal*]
3. Detailed Schedule and Cost: State the ability of the contractor to meet the required date to build the system. All bidders shall submit a task-based budget which includes a not-to-exceed total project cost. [*Complete the “Budget Table” provided below*]
4. References: Please provide a table listing references with current phone numbers.
5. Contracting Requirements: Consultant must provide copies of the insurance documents required in section [code].

Sample Budget Table

Item	Cost
Container	
Decontamination equipment	
Low pressure system	
High pressure system	

Recycling system	
Water pick-up system	
Installation of equipment	
Freight to vendor	
Freight to site	

The following table includes an approximation of cost based on proposals received by TRPA & CPW, 2018.

(We can provide more accurate numbers once invoiced and break it out into more meaningful categories)

Section	Low Estimate	High Estimate
Heating System - Low Pressure	\$8,000.00	\$38,000.00
Heating System - High Pressure	\$2,700.00	\$24,000.00
Recycle System		\$50,000.00
Interior Heater		\$1,000.00
Water Pickup		\$5,000.00
Recycle System		\$50,000.00
Enclosure	\$1,700.00	\$24,000.00
Installation	\$0 (Included)	\$12,500.00
Freight	\$0 (Included)	\$8,500.00