32801-11779 TWRA Chronic Wasting Disease ("CWD") Crematory Specifications

EVENT DESCRIPTION

This event is for Tennessee Wildlife Resources Agency ("TWRA") to purchase an animal crematory for the primary purpose of incinerating deer carcasses and the associated mixed waste stream for the appropriate disposal of potentially infectious material associated with Chronic Wasting Disease ("CWD"). Other materials will be cremated as needed. The crematory shall be housed within a dedicated structure in West Tennessee and will include necessary infrastructure to support its operation. This solicitation will be for the procurement of the deer carcass crematory which includes, but is not limited to design, manufacturing, delivery, installation, operational testing, and operational training. In addition, the Manufacturer shall be responsible for collaborating with TWRA staff regarding the design and construction of the necessary infrastructure to support the operation of the crematory. The contract awardee shall be the direct manufacturer of the crematory.

Respondents are to propose their best price for a machine that can meet all minimum requirements of the specifications. The bid price shall include all costs. Bid submission documents shall include a drawing of the proposed crematory with dimensions, specifications, and capacities.

ANTICIPATED WASTE STREAM MATERIALS

The waste stream will be mixed and varied; organic materials will generally be the primary component, but the proportions of materials will vary. Exact weights of each waste type will not be calculated for each load. The waste stream will include, but not be limited to:

- Organic waste material (intact and pieces, frozen and thawed)
    - Organic waste material will include domestic animals and wildlife ranging in size from small particles to single, large items.
    - Generally, the dimensions of an outstretched, intact, frozen, adult white-tailed deer carcass, with antlers, with minimum dimensions of 84" x 60" x 30" and 250 lbs.
    - Generally, a large item will be similar to a single intact, frozen, adult domestic cow or horse with approximate minimum dimensions of 105" x 70" x 40" and 2,500 lbs.
- Fabrics
- Tyvek
- Rubber
- Plastics
- Nitrile
- Latex
- Paper, cardboard, paperboard
- Antlers
- Hair
- Bone
- Wood products
- Dry waste materials
- Bullet fragments, scalpels, forceps, knives, and other metal objects (all metal objects will be enclosed in a standard "SHARPS" container

- Miscellaneous other unidentified items

GENERAL SPECIFICATIONS

- All equipment shall meet industry standards as well as Environmental Protection Agency ("EPA") and other government regulators.
- The crematory shall be constructed with reliable industry standard components, including but not limited to:
    - All doors shall be safety interlocked with provision for padlocks.
    - Burners and hydraulics shall require a key for operation as a safety and security measure.
    - Sandblast prep and finish with high temperature industrial rust inhibiting primer and finish coating for all appropriate surfaces
- The crematory shall be capable of burning a minimum of 500 lbs. per hour of the **ANTICIPATED WASTE STREAM MATERIALS**.
- Waste reduction of **ANTICIPATED WASTE STREAM MATERIALS** shall be a minimum of 95% by weight.
- The crematory shall be capable of regularly accepting single frozen items of at least half of the hourly burn rate.
- The crematory shall ensure that all waste materials reach 1000°C during operation. For this reason, the crematory shall include a mechanism to monitor and record that all ash and other solid by-products reach a minimum temperature of 1000°C for every cycle.
- The crematory shall be capable of continuously operating for up to 16 hours per day.
- The crematory shall include two chambers: Primary and Secondary.
    - The secondary chamber shall operate at a minimum temperature of 1000°C.
    - The secondary chamber shall have a minimum gas residence time of two (2) seconds.
- The crematory startup, loading, purge, and preheat shall be automatic and shall include a user-selected manual operation.
- For each burn cycle, the crematory shall produce a record of operating temperature, minimum ash temperature, and secondary chamber residence time.
- The combustion air blower shall supply high pressure air to the fuel burners, the secondary chamber combustion air manifold, and shall be equipped with modulating butterfly dampers. The dampers shall be actuated by Honeywell™ modulating motors, or equal, to provide modulated combustion air to the incinerator system as required.
- Manufacturer shall ensure all noise levels meet Occupational Safety and Health Administration standards.
- Each fuel burner shall have UL (Underwriters Laboratory) approved fuel train

GENERAL MANUFACTURER REQUIREMENTS

- Manufacturer shall provide prompt and responsive customer service throughout the contract award, design, construction, training and warranty periods. At a minimum, manufacturer shall respond within one business day to phone calls and emails. Response shall be by a person qualified to address the issue.
- Manufacturer shall collaborate with TWRA staff on the planning, design, and construction of the structure housing the crematory and to provide all requested information in a timely and productive manner.
- Engineers or other qualified staff shall be directly available by telephone and electronic mail to TWRA staff for operational assistance and troubleshooting for a minimum of one-year post-construction.
- Manufacturer shall warrant and represent that the equipment will perform in conformance with the specifications set forth in this contract and shall be suitable for the incineration of waste in the capacities set forth in **ANTICIPATED WASTE STREAM MATERIALS** and will meet or exceed the environmental, safety laws and regulations, and emission parameters presented.
- The equipment shall be free of material defect for a period of one year.
- Manufacturer shall deliver equipment within one hundred eighty (180) days of receipt of Purchase Order.
- Manufacturer shall provide all installation of equipment within thirty (30) days of delivery.
- Manufacturer shall provide onsite training to five (5) employees' after installation to ensure successful startup.
- Manufacturer shall provide all preventive maintenance including parts and labor for a period of one year.
- Consumables are not covered under the purchase or warranty.
- Manufacturer shall provide five (5) printed sets of operator and maintenance manuals.
    - All program data for programmable devices
    - Printout of actual programs
    - All pressure, timer, switch, regulator, etc. recorded settings
    - Electrical schematics with part numbers
    - Piping schematic with part numbers
    - Hydraulic schematic with part numbers
    - Burner and combustion air piping schematic with part numbers
    - Systems description
    - Alarm listing and corrective procedures
    - System overview drawings
    - Technical bulletin of every device included in system
    - In English
    - Spare parts listing and prices

PROGRAMMABLE CONTROL SYSTEM (PCS) WITH INTERFACE

- Control of loader and cart dumping device, secondary burner, primary burner, flame controls, temperature controls, air blowers, safety and operating interlocks shall be by the PCS.
- Panel shall include power distribution breakers, motor starters, and Human-Machine Interface ("HMI") display modules.
- Screen shall also display:
    - Primary Chamber Temperature
    - Secondary Chamber Temperature
    - Ash/Solid By-Product Temperature
    - Time remaining to the next load cycle
    - Hydraulic Pressure
    - Charge ram position.
    - Burner Enable time remaining.
    - Blower Enable time remaining.

LARGE ITEM CAPABILITY AND FEEDING

- Generally, a large item will be up to five (5) times the hourly burn capacity weight and volume and similar to a single intact, frozen, adult domestic cow or horse with minimum dimensions of 105" x 70" x 40" and 2,500 lbs.
- Large items will be cremated rarely and will only be loaded when the unit is cold, once a day.
- The crematory may be designed to accommodate only manual loading of large items or be designed to have automatic (as outlined in CREMATORY WASTE FEED) AND manual loading mechanisms.
- The large item opening may be sited either with the ash removal opening as outlined in ASH REMOVAL or with the standard waste feed outlined in CREMATORY WASTE FEED
- The primary chamber shall include an adequately sized large item opening (as outlined in **ANTICIPATED WASTE STREAM MATERIALS**) to accept an intact large item.
- The large item opening shall include an adequately sized refractory lined door, hinged on structural bearings, safety interlocked to burners and with padlock provisions.
  The crematory shall include a large item feeding system comprised of a winch and ramp or similar feeding system at floor level for loading a single, intact item as outlined in **ANTICIPATED WASTE STREAM MATERIALS** that is five (5) times the hourly capacity by weight and volume, similar to a single intact, frozen adult domestic cow or horse.

HEARTH AREA

- Hearth area shall be insulated, large and relative in size to the **PRIMARY COMBUSTION CHAMBER** and **ANTICIPATED WASTE STREAM MATERIALS**.
- Refractory dam shall allow liquids up to 9" deep to collect in the primary chamber without leakage.
- Hearth area minimum chamber shell dimensions relative to the desired capacity for **PRIMARY COMBUSTION CHAMBER**.
- Hearth area chamber shall be lined with a minimum 6" 2,550°F refractory, 2" board insulation, and shell constructed of American Society for Testing and Materials ("ASTM") A36 plate steel or equal.
- A minimum 1/8" outer jacket shall be provided with a minimum 3" air gap between shell and jacket
- Hearth area shall be flat and adequately sized to accommodate a large item as specified in **LARGE ITEM CAPABILITY AND FEEDING**,
- Shell shall be constructed with ASTM A36 plate steel or equal.
- Hearth area shall be inclined into primary chamber.

EXHAUST STACK

- Exhaust stack shall be adequate to comply with all applicable regulations at national, state, and local levels.
- Visible emission average shall be less than 5% opacity. No visible smoke shall be emitted from the exhaust stack.
- Particulate ≤ 0.1 lbs./100 lbs. waste per hour minimum.
- CO ≤100 parts per million by volume on dry weight basis ("PPMDV") hourly average.

ASH REMOVAL

- The crematory shall include an ash removal opening of adequate size to fully clean the crematory.
- The ash removal opening shall include a refractory lined unload door, hinged on structural bearing, safety interlocked to burners and provided with padlock provisions.
- Ash removal shall be by high power vacuum, fitted with drum adapters and five 55-gallon minimum drums, metal hose and wand and HEPA filter.

PRIMARY COMBUSTION CHAMBER

- Primary combustion chamber shall be lined with a minimum 6" 2,550°F refractory, 2" board insulation, and shell constructed of American Society for Testing and Materials ("ASTM") A36 plate steel or equal.
- Chamber heat release shall not exceed 15,000 btu/ cubic foot/ hour
- Primary combustion chamber may include one or two openings. One of these openings must allow for automatic loading of a minimum of the hourly capacity specified in **ANTICIPATED WASTE STREAM MATERIALS** and **GENERAL SPECIFICATIONS** by weight and volume **ANTICIPATED WASTE STREAM MATERIALS** and **GENERAL SPECIFICATIONS**. For further

explanation, refer to **GENERAL SPECIFICATIONS** and **LARGE ITEM CAPABILITY** and **CREMATORY WASTE FEED**.

- Primary combustion chamber dimensions shall be adequate and relative to the desired capacity, by weight and volume of the **ANTICIPATED WASTE STREAM MATERIALS**.
- Primary burners shall be appropriately sized to meet:
    - Operating temperature requirements of the primary combustion chamber as outlined in **GENERAL SPECIFICATIONS**
    - Volume capacity of the primary combustion chamber
    - **ANTICIPATED WASTE STREAM MATERIALS**
- Primary burners shall have interlocks to ensure safe operation; switches must be in the on position, load and unload doors must be proven locked, start-up and pre-purge interlock.
- Each fuel burner should have UL approved fuel train
- All access to the primary chamber shall include an adequately sized refractory lined door, hinged on structural bearings, safety interlocked to burners and with padlock provisions

SECONDARY COMBUSTION CHAMBER

- Secondary combustion chamber shall be lined with a minimum 6" 2,550°F refractory, 2" board insulation, and shell constructed of American Society for Testing and Materials ("ASTM") A36 plate steel or equal.
- Secondary combustion chamber dimensions shall be adequate and relative to the desired capacity.
- Secondary burners shall be appropriately sized to meet:
    - Operating minimum temperature requirements of the secondary combustion chamber as outlined in **GENERAL SPECIFICATIONS**
- Secondary burners shall include burner interlocks to ensure safe operation; switches must be in the on position, load and unload doors must be proven locked, start-up and pre-purge interlock.
- Each fuel burner should have Underwriters Laboratory (UL) approved fuel train
- Secondary burners shall be appropriately sized to the capacity of the primary combustion chamber, the **ANTICIPATED WASTE STREAM MATERIALS**, and capacity.
- The secondary combustion chamber shall include an internal combustion air manifold with adequate combustion air input jets. Combustion air manifold and air jets shall be embedded in the refractory lining of the secondary chamber. The combustion air manifold shall be relative to the unit's capacity of heating surface and shall employ wasted energy lost through the secondary chamber shell to preheat secondary combustion air. The combustion air manifold shall be fabricated of 1/4" minimum A36 steel plate or equal. Air jets shall be arranged for optimum combustion air turbulence. Air jets shall be fabricated of minimum 1" schedule 80 pipe or equal.

CREMATORY AUTOMATIC WASTE FEED

- Waste (as outlined in **ANTICIPATED WASTE STREAM MATERIALS** and **GENERAL SPECIFICATIONS**) shall be loaded via a feeding system that includes user-selected automatic and manual capabilities and is operated from a control box.
- The automatic waste feed shall be capable of loading an outstretched, intact, frozen, adult white-tailed deer carcass. Generally, the dimension of an outstretched, intact, frozen, adult white-tailed deer carcass will be a maximum of 84" x 60" x 30" and 250 lbs.
- Crematory waste feed shall include a fire door, hopper lid, hydraulic loader and cart dumping device, hydraulic pump, cylinders, and at least eight waste load carts.
- Hopper shall be capable of accepting a minimum of the hourly capacity specified in **GENERAL SPECIFICATIONS** by weight and volume of the **ANTICIPATED WASTE STREAM MATERIALS**.
- The hopper opening shall be of sufficient dimensions to accept a minimum of the hourly capacity as specified in **ANTICIPATED WASTE STREAM MATERIALS** and **GENERAL SPECIFICATIONS**.
- Hopper lid should be hinged and equipped with a suitable gasket.
- Fire door shall be sized adequately and relative to the **ANTICIPATED WASTE STREAM MATERIALS** and the capacity outlined in **GENERAL SPECIFICATIONS**.
- Fire door with a minimum 2" insulation and 6" refractory including dual heat shield. Fire door shall be sealed with rope seals or equal.
- Waste feed shall have sufficient stroke to push waste 12" into the primary chamber.
- Automatic reverse and recycle and upon ram jam or fire door failure to close.
- A spray mist system shall be included for fire protection and post feed cycle rinse.
- The loader and cart dumping device shall be mutually designed with TWRA staff to lift individual carts and rotate contents into the waste feed hopper.
- The cart dumping device shall be fully interlocked to hopper lid and automated to the extent possible.
- The carts must be sufficient to transport and load a minimum of the hourly capacity (by weight and volume) of the **ANTICIPATED WASTE STREAM MATERIALS** and **GENERAL SPECIFICATIONS**.
- Waste feed assembly shall be inclined at a minimum of 1° into the primary chamber for drainage.