#### I. Executive Summary

The Covanta Tulsa Renewable Energy LLC ("Covanta Tulsa" or "Facility") began commercial operation in May 1988 on an 18.2-acre site in Tulsa, OK. It includes three large municipal waste combustors (MWCs) which are permitted to process a total of 1,125 tons per day (TPD) of solid waste per day and generate 16.3 megawatts of renewable energy, with most being sold to Eversource Energy. Municipal solid waste is received from the City of Tulsa and area communities. Nonhazardous industrial wastes are processed at the Facility as well as currently permitted with the Oklahoma Department of Environmental Quality. The Facility is owned and operated by Covanta Tulsa.

The Facility is equipped with three 375 ton-per-day water wall furnaces and ash handling systems. Each of the three units is equipped with state-of-the-art air pollution control equipment including a selective noncatalytic reduction ammonia injection system for the control of oxides of nitrogen, a semi-dry flue gas scrubber in which lime is injected for acid gas control, an activated carbon injection system for the control of mercury and organic substances and a pulse jet fabric filter for secondary control of acid gases, organics and particulate. The combustion units are also equipped with continuous emissions monitoring systems to ensure that the Facility's emissions profile is consistently well below applicable emission standards. The waste processing equipment and emission control systems are described more fully in Appendix M.

This Executive Summary and the referenced documents provide the Oklahoma Department of Environmental Quality Land Protection Division with reasonable assurance that the combustion of RMW with municipal solid waste (MSW) at the Tulsa Facility will be in accordance with applicable laws and regulations and in a manner that is protective of public health. The remainder of this permit application includes the following:

- Section II Purpose of the Project
- Section III Facility Details
- Section IV Project Details
- Section V Facility Operations
- Section VI Safety
- Section VII Recordkeeping
- Section VIII Training
- Section IX Construction Activities
- Section X Summary

- Appendices provide further information related to this permit modification effort as listed below.
  - Appendix A Maps
  - Appendix B Permit Application Forms
  - Appendix C RMW Processing Standard Operating Procedures
  - Appendix D Terms and Abbreviations
  - Appendix E Proposed Site Plan and Equipment
  - Appendix F Waste Exclusion Plan
  - Appendix G Stormwater OPDES Permit
  - Appendix H Closure Plan
  - Appendix I RMW Opportunity Management Program
  - Appendix J October 2009 Permit Modification Related to Out of State NHIW
  - Appendix K ODEQ Title V Air Quality Permit 2014-1722-TVR (M-1)
  - Appendix L Draft Notice of Filing
  - Appendix M Waste Combustion System
  - Appendix N Air Emission Information
  - Appendix O Permitting Checklist and Regulatory Applicability Analysis
  - Appendix P Pathogen Destruction
  - Appendix Q Covanta Forms Applicable to Regulated Medical Waste
  - Appendix R SOP-Material Compliance (QA/QC)
  - Appendix S Pertinent information from other Covanta RMW Treatment Facilities
  - Appendix T Emergency Response Agreements
  - Appendix U Florida Department of Environmental Protection, March 6, 2018
    Technical Evaluation & Preliminary Determination Report

#### II. Purpose of the Project

Covanta Tulsa Renewable Energy LLC ("Covanta Tulsa") is applying for a Solid Waste Processing Facility Permit Modification for its facility located at 2122 S. Yukon Ave, Tulsa OK74107 (the "Facility"). The Facility is currently permitted for municipal solid waste (MSW) processing and specified nonhazardous industrial waste streams. Covanta Tulsa seeks to receive and process untreated regulated medical waste (RMW) at the Facility. This application describes the methods by which Covanta Tulsa will successfully and safely receive, inspect, handle, dispose, and monitor for the destruction of pharmaceutical wastes.

Specifically, this Application seeks approval for the following:

- RMW treatment within the existing municipal waste combustor (MWC) units at the Facility
- Designated short-term staging areas for RMW
- A new Profiled Waste Processing Building
- An integrated and automated feed system to directly feed the RMW to the MWC units
- Site plan modifications
- Updated Waste Exclusion Plan (WEP) and Operating Plan

Covanta Tulsa is proposing to accept and treat RMW at its Facility. With this modification, Covanta Tulsa will help meet the need for safe, sustainable RMW disposal in the State of Oklahoma.

Covanta Tulsa's parent Company -- Covanta Lancaster, Inc ("Covanta") -- has had a well-established RMW program for over thirty years. The RMW program includes a rigorous compliance assurance program for waste profiling, waste acceptance criteria, and RMW-source facility site audits to ensure shipment of RMW meets specifications. Further, the operating, maintenance, contingency and training plans have been developed and implemented at three of Covanta's existing resource recovery facilities located in Marion County, Oregon; Lake County, Florida; and Huntsville, Alabama. Covanta's resource recovery facilities are designed with combustion systems that ensure pathogen destruction and air pollution control technology that ensures no increase in emissions from the combustion of MSW together with RMW. These sister facilities are equipped with the same stateof-the-art RMW delivery systems as proposed for Covanta Tulsa and which minimize employee handling of RMW.

### III. Facility Information

 A. Applicant Name: Covanta Tulsa Renewable Energy LLC 2122 S. Yukon Ave Tulsa OK 74107 918--699-0011

# B. Facility Information Covanta Tulsa Renewable Energy LLC 2122 S. Yukon Ave Tulsa OK 74107 918-699-0011

#### C. Property Owner Covanta Tulsa Renewable Energy LLC 2122 S. Yukon Ave Tulsa OK 74107 918-699-0011

- D. Disclosure Statement Not required
- E. Legal Description

Northerly nine hundred feet (900') of the easterly one thousand eighty-five feed (1085') of NW ¼ of NE ¼ of Section 15, Township 19 North, Range 12 East, Tulsa County, Oklahoma

**Appendix A** contains a graphical reference of the Facility and the permitted boundary.

#### IV. Project Details

A Pre-Permit Draft Standard Operating Procedure (SOP) for the management of RMW at the Tulsa Facility is contained in **Appendix C** of the Application. The purpose of the SOP is to:

1) Present the equipment and operational procedures that will be used to process RMW at the facility,

2) Specify the environmental controls and safety measures that assure compliance with applicable regulatory standards and definitions, and

3) Describe the hazard recognition and risk mitigation training of personnel handling RMW.

The SOP for RMW was developed based upon experience gleaned from other Covanta facilities combusting RMW as well as the information contained in this Application for the Tulsa facility. The SOP is focused on the safe handling and processing of RMW to ensure compliance with all safety, health and environmental regulations. Covanta reserves the right to reject any shipment of RMW deemed unsafe for processing. The site-specific SOP for the Tulsa Facility will be finalized after construction and in advance of receiving RMW.

As previously mentioned in this Application, Covanta has 30+ years' experience with RMW processing. Photographs and figures provided in this Section and in the referenced appendices are drawn from Covanta's operating facilities.

#### A. Regulated Medical Waste Receipt and Inspection Procedure

RMW will be delivered to the Facility by licensed RMW haulers. All loads of RMW delivered to the Facility will be scheduled in advance. Trucks may be of a box truck type design or a tractor/trailered load. Upon arriving at the Facility, each vehicle will be weighed at the scale house located just inside of the security gate.

Like MSW trucks, RMW waste vehicles will be scanned for radioactivity at the scale house. A scale record will include the source (name of the hauler or cartage firm), origin, date, time, and quantity (tons) of the RMW. A Pre-Shipment Notification form provided with each individual delivery will also be signed as the certification of disposal/destruction of the waste. A signed copy of this form will be provided to the driver and another copy will be kept at the Facility for recordkeeping. Once weighed, each truck will be directed to the RMW/Profiled Waste Receiving Area or to the secured staging area.

Drawing E-1 in **Appendix E** of the Application depicts the proposed receipt and processing area of RMW at the Tulsa. Depending upon availability, RMW drivers may be instructed to back up directly to one of the loading docks located on the east side of the Profiled Waste Receiving Warehouse. In most cases, the driver will instead be sent to the designated RMW Staging Area as shown on Drawing E-3. The driver will be directed to park the trailer in an

open parking slot and unhook the full trailer from the tractor. The driver will then be directed to connect to an empty trailer and exit the Facility. Trailers containing pathological RMW or contaminated carcasses or body parts of animals intentionally exposed to pathogens in research, in the production of biologicals or the "in vivo" testing of pharmaceuticals will be maintained in refrigerated units, if not processed within 24-hours, to ensure the RMW is maintained in a non-putrescent state.

Any RMW shipment that is not processed within 96 hours of delivery, will be sent to a facility permitted to manage RMW.

Covanta Tulsa's staff will use a yard jockey truck to move full trailered loads from the Staging Area to the enclosed Profiled Waste Receiving Warehouse. Empty trailers will also be moved out of the loading docks using the yard jockey truck and will be relocated to the truck Staging Area.

Each customer shipment must be accompanied by a Covanta RMW Load Certification document (see **Appendix Q**). On the Load Certification document, the customer certifies that the delivery accompanying the Certification contains only Regulated Medical Waste, as defined in the Waste Disposal Agreement in effect with the customer, contains no Unacceptable Waste as defined in the Agreement and is not subject to regulations as hazardous waste under Federal Resource Conservation and Recovery Act (RCRA).

Trained staff at the Facility will perform thorough Quality Assurance/Quality Control (QA/QC) inspections on RMW shipments using a prescribed Covanta QA/QC inspection form (see **Appendix Q**). This form may be in a paper or an electronic format. The QA/QC inspection form is used to ensure that the proper paperwork is accompanying the load, is used to document the condition of the load, and is used to document any discrepancies. Additionally, QA/QC inspectors will verify that RMW load meets proper waste packaging and labeling requirements and proper Generator and Transporter information markings.

Discrepancies will be recorded by QA/QC staff which will then trigger customer notification and corrective action. Depending upon the severity of the exception, it may trigger a load rejection, customer suspension, and/or automatic inspection of the customer's site.

In the event of a leak or spill, the area immediately surrounding the waste shall be disinfected in accordance with the instructions of the disinfectant found in the RMW Process Area Spill Kit. In addition to the spill kit, the Facility will maintain an eye wash station and a storage unit to segregate tools only to be used in the Profiled Waste Receiving Warehouse and the Profiled Waste Processing Building, and not elsewhere in the Facility.

Drawing E-2 in **Appendix E** shows a floor plan and foundation of the RMW receiving area. Trained staff with the proper personal protection equipment will perform the unloading of the trucks/ trailered loads in the Profiled Waste Receiving Warehouse. RMW will then be transferred by forklift through a gallery from the Waste Receiving Warehouse into the new Profiled Waste Processing Building. The RMW will then be loaded onto the new RMW Automated Feed System (AFS). As shown on Drawing E-1, the new Profiled Waste Processing Building will also provide cover for the existing Automatic Pallet Staging Conveyor used to convey profiled waste from the Profiled Waste Receiving Warehouse to the tipping floor.

RMW that arrives in reusable totes will be removed from the truck/trailer then emptied from the tote into a 4-sided enclosed AFS Bin using the forklift. As shown below in Figure 1, the 4-sided AFS Bins will be fabricated from ASTM A36 carbon steel that are seam welded and measure  $60'' \times 60'' \times 72''$  high. The loaded AFS bin will then be staged or stored as described above. The empty totes will be loaded back into trucks/trailers for return to customer.



Figure 1 Contents of the reusable totes dumped into the 4-sided fully enclosed AFS bin.

The palletized RMW shipments will be unloaded using a forklift into the 3-sided AFS Bins. The unpalletized RMW shipments (example, Figure 2) will be manually unloaded within the trailer into 3-sided AFS Bins. The 3-sided bins (Figure 3) will be fabricated from ASTM A36 carbon steel and measure 60" x 60" x 72" high. Forklifts will move the AFS bins to the AFS or to temporary staging/storage in the Profiled Waste Processing Building.



Figure 2 Un-palleted boxed RMW is loaded into 3-sided AFS bins within trailer



Figure 3 Example of 3-sided AFS bins

After all RMW has been removed from the trailer, the yard-jockey will relocate the empty trailer to the Staging Area. The next full trailer of RMW material will then be brought to the Profiled Waste Receiving Warehouse.

The AFS will transfer individual bins of RMW up to one of the three (3) MWC feed hoppers for combustion as described in more detail below.

#### B. Regulated Medical Waste Automated Feed System (AFS)

Covanta Tulsa proposes to construct an automated, computer-controlled, Automated Feed System (AFS) to transfer RMW from the Profiled Waste Processing Building directly to the feed chutes of the MWC units. This system is designed to minimize potential worker contact with the RMW. The proposed AFS will be enclosed and located adjacent to the south wall of the new Profiled Waste Processing Building. This controlled process has dedicated resources and trained personnel who will process this waste. Figure 4 depicts an example of an AFS and shows components the RMW flow path within the Facility. Detailed drawings of the proposed RMW AFS for the Tulsa Facility can be found in **Appendix E** of the Application. An east elevation of the proposed AFS is shown on Drawing S-4. Drawing S-5 contains details and sections of the system and Drawing S-3 shows a roof framing plan.



Figure 4 - Example Automated Feed System

The forklift will load the AFS bins from the Profiled Waste Processing Building onto the AFS Tipping Floor Transfer conveyor. This conveyor will then load the AFS elevator.

Radiation screening will be completed when trucks are inspected at delivery. Additional radiation screening is not anticipated.





Figure 5a AFS conveyors at tipping floor grade elevation. Figure 5b Example of forklift loading Tipping Floor Transfer conveyor.

The elevator system will vertically lift the AFS bin from floor elevation of the Profiled Waste Processing Building to the charging deck elevation of the MWCs.



Figure 6 AFS Elevator Unit to transport full & empty AFS bins

At the charging deck level, the elevator will feed onto the horizontal Charging Deck Transfer Conveyor. This elevated conveyor allows for sequenced shuttling of full and empty AFS bins back and forth).



Figure 7 Example AFS Charging Deck Transfer Conveyor to move full & empty AFS bins

The charging deck conveyor loads the AFS bin onto the AFS dumper conveyor which transports the AFS bin and drops the waste into the selected MWC feed chute as shown in Figure 8.



Figure 8 Typical AFS Dumping mechanism feeding MWC feed chute

Once in the feed chute, the RMW will mix with MSW and feed by gravity to the integrated MWC furnace feed table. From the feed table, the waste will be hydraulically pushed into the combustion chambers of the MWCs.

The empty AFS bin will then return on these same conveyors/elevator to the Profiled Waste Processing Building and the cycle is repeated.

#### C. Covanta RMW Processing Rate

Covanta Tulsa is currently permitted to receive and process 375 tons per day (TPD) of MSW and non-hazardous industrial waste in each of the three (3) MWC units at the Tulsa Facility as authorized by the Department, for an annual maximum throughput rate of 410,625 tons.

Covanta Tulsa proposes to receive and process a maximum of 40,000 tons of RMW per year <sup>1</sup>. The proposed annual rate of RMW processing of 40,000 tons is equal to approximately 9.75 percent of the permitted annual waste processing rate of the Facility. Records of the quantities of RMW received and processed will be maintained. Operationally, the facility will balance and blend RMW, MSW, and any profiled wastes to ensure a consistent fuel profile for the burners.

#### D. Waste Combustion System

No change to the waste combustion process is contemplated with this permit modification application except for allowing the processing of RMW at the rates indicated above. The information in this section describes the waste combustion system. A more detailed description of the waste combustion system is provided in **Appendix M**. **Appendix P** provides a greater discussion related to the pathogen destruction capabilities of the combustion system.

The process begins when waste is charged to the feed chute. The primary fuel, i.e., MSW, is loaded into the feed chute from the storage bunker via an orange peel grapple. Boxed regulated medical waste will be introduced to the feed chute by way of the automated hopper feed system described above. The feed chute not only serves as a mechanism for introducing waste into the combustion chamber, but also serves the purpose of providing an airlock to prevent unwanted ambient air into the combustion chamber. From the feed chute, waste is metered into the combustion chamber by hydraulic ram feeders. The feeder system is automatically controlled by a combustion algorithm that monitors critical combustion parameters such as oxygen levels, temperatures, and steam production rate within the boiler. The feeder meters waste onto the combustion grate. The combustion grate simultaneously agitates the waste for complete combustion while allowing combustion air (also referred to as underfire air), to flow up through the waste. Combustion

<sup>&</sup>lt;sup>1</sup> The capacity of the Facility and the planned AFS system for processing RMW is equal to approximately 44,000 tons.

air is also introduced above the grate in the form of overfire air. The combination of the underfire air and the overfire air is supplied at a rate sufficient to achieve complete combustion of the waste. The residence time of the waste on the combustion grate varies depending on multiple factors but is about 45 minutes. Once the waste is completely combusted it is reduced to combustion ash, which drops via gravity off the end of the grate into the ash discharger. Like the waste feed chute, the ash discharger serves the dual purpose of evacuating combustion residue (ash) from the furnace while providing an airlock to prevent introduction of unwanted ambient air.

Combustion of the waste within the furnace is accomplished in a single chamber. Initially, heat is applied to the waste through the auxiliary burner. Once combustion of the waste is initiated, liberated heat from the previously fed waste will ignite newly charged waste. As discussed above, the combustion rate is tightly controlled by the amount of air being supplied through the underfire and overfire air systems. The temperature within the combustion zone just above the grate system is designed to be more than 2,000 °F. This temperature assures that the organic content of the waste is vaporized and that pathological components are destroyed.

#### 1. Air Pollution Control (APC) System

The information in this section is provided to assist the reader in understanding Covanta Tulsa's APC system.

The APC equipment for MWC Units 1 2, and 3 consists of a spray dry absorber (SDA), fabric filter baghouse (FF), activated carbon injection system (ACI), and selective non-catalytic reduction system (SNCR). The combustion zone of each boiler is equipped with auxiliary fuel (natural gas) burners to control combustion during periods of start-up, shutdown and malfunction/transient conditions. Continuous emission monitors (CEM) are installed in the outlet ducts of the boiler economizer and induced draft fan (post FF) before the flue gas exits out the stack.

The APC system for each combustion unit includes the following technologies:

- a) **Spray Dryer Absorber**: The SDA uses a liquid lime slurry reagent to remove acid gases, (SO<sub>2</sub>, HCl & HF) from the flue gas. Injection nozzles spray lime slurry into the flue gas stream. The lime slurry mixes with the flue gas in the SDA vessel to remove acid gases. The waste formed in the acid gas removal process is dry and is capable of being readily collected in the baghouse.
- b) Activated Carbon Injection: The ACI system is used for mercury and dioxin/furan removal. The system pneumatically injects activated carbon into the flue gas ductwork downstream of the boiler economizer. Vapor

phase mercury and dioxin/furans present in the exhaust stream adsorb to the carbon particles which can then be removed from the flue gas downstream in the fabric filter baghouse.

- c) **Fabric Filter**: A pulse jet type fabric filter baghouse removes particulates from the combustion process including the fly ash from the furnace, lime and carbon injected into the gas stream and pollutants they remove.
- d) **Selective Noncatalytic Reduction**: Aqueous ammonia is injected into the furnace of the boilers to react with the nitrogen oxides formation to drive the reaction from NOx to N<sub>2</sub>, CO<sub>2</sub>, and H<sub>2</sub>O. The system consists of transfer pumps, piping, metering instruments and injection lances.

Covanta has several similar facilities which currently receive and safely process RMW. **Appendix N.2** presents stack testing results from Lake County, Florida which were conducted while the facility was combusting approximately 10% RMW. The data show the combustion and air pollution control devices adequately protect human health and the environment. The appendix also includes stack testing during which cofiring of RMW was not occurring. The emission profiles indicate cofiring of RMW does not change the emission profile for the facility.

#### E. Easement

Covanta Tulsa's facility has previously provided easement access to the Oklahoma Department of Environmental Quality. No changes are needed to the easement as a result of this permit modification.

#### F. Planned Life of the Facility

This project will not impact the planned life of the facility.

#### G. Road Construction – On Site

No changes to the onsite roadways are anticipated except as noted in the drawings provided in **Appendix E. The** addition of the Staging Area to the south of the exit ramp from the Facility will include a limited amount of additional concrete roadway.

#### H. Heavy Equipment for use during Construction and Operation

The site construction will be accomplished using typical construction equipment – backhoes, dump trucks, graders, trackhoes, and the like. Specialized equipment may be needed to attach the elevators to the charging deck and tipping floor as well as construction of the charging conveyor.

A yard truck will be used during site operations to move trailers from the staging area to the Profiled Waste Receiving Warehouse. Covanta already uses a yard truck at the Facility.

#### I. Zoning

The facility is located in an area zoned IM (Industrial Moderate). The processing of RMW is not precluded for the facility's zoning.

#### J. All-Weather Roads

The Staging Area will be constructed of compacted crushed stone, asphalt, or concrete providing acceptable roadways and parking conditions under all weather conditions.

#### K. Facility Signs

As this is a permit modification, signage for the Covanta Tulsa facility is already in place.

#### L. Salvage Operation

Covanta Tulsa provides resource recovery operations. The fuel, in the form of municipal solid waste and other non-hazardous industrial waste streams, provides steam and electricity to industrial and municipal users. Further, the ash product from the combustion includes both ferrous and non-ferrous recovery. No change to the salvage operation is anticipated as a result of the addition of the RMW waste stream.

#### M. Closure Plan

Covanta Tulsa will close the facility in a manner which eliminates the need for further maintenance and controls. Covanta Tulsa will clean and close the Facility.

The Closure Plan is updated to include the potential presence of RMW at the Facility and is included in **Appendix H.** 

#### N. Post Closure Care

Closure activities will remove all waste from the Facility and the site. There will be no waste in the form of residuals or storage upon completion of the Closure Plan. The site will be clean and clear for another user to occupy the site. Therefore, post closure follow-up will not be required upon completion of the Closure Plan.

#### V. Facility Operations

The Covanta Tulsa facility currently receives and processes municipal solid waste in addition to non-hazardous industrial wastes as allowed under the Facility's existing Solid Waste and Air Quality permits. This permit application seeks to allow the Facility to process RMW. This Section addresses Facility Operations as impacted or changed as a result of processing RMW.

#### A. Stormwater Management

The Permit Modification to treat RMW at the Covanta Tulsa facility will have minimal impact on stormwater. The Facility operates under Stormwater OPDES Permit OK0044156, and all stormwater at the Facility is routed to the impoundment on the north side of the Facility. The impoundment has a single outflow in the northeast corner of the impoundment which flows to the City of Tulsa's stormwater system. The outfall remains closed at all times to prevent discharge. The valve is opened rarely as stormwater is typically held onsite.

The Profiled Waste Processing Building will be located in an area that is currently a grassy hillside with stormwater running off the hillside toward the north and toward the processing portions of the plant. Currently, water from the grassy hillside is routed to the stormwater collection system via curbing which separates the stormwater from process water areas. Stormwater generated from the new Profiled Waste Processing Building roof and increased building area will be routed to the stormwater collection piping which runs south to north approximately 50' inside the fence line and connects to the weir at the entrance to the impoundment (F02). The increase in stormwater flow to the pond from this additional building is not considered significant.

The area intended for staging delivery trucks is currently grass. The area does not currently receive any stormwater run on, and stormwater is prevented from running off by significant grading along the east and south property boundaries. Stormwater in this area is currently routed to F02 via the stormwater collection piping along the eastern portion of the Facility. With the addition of the Staging Area, Covanta Tulsa plans to route any stormwater from the parking area into the existing onsite piping system to convey the stormwater to the impoundment. All wastes are maintained within the truck trailers and are not exposed to stormwater.

Maps and Drawings associated with the planned Transfer Building and the Staging Area are provided in **Appendix A. A** copy of the current OPDES permit is provided in **Appendix G.** 

#### B. Facility Additions and Changes to Support RMW Processing

The RMW operation will be supported with the construction of the following:

**Profiled Waste Processing Building** – to allow the unloading and transfer of material to conveyors indoors

**Conveyors and Lifts** – two conveyors and lifts will be installed to deliver the contained RMW material directly to the feed hoppers of the three units

**Tipping Building Modifications** – including the addition of a push wall and modifications to columns for access

**Refuse Building Modifications** – primarily associated with connecting the roof of the Transfer building to the Refuse building's structure

**Staging Parking Area** – to allow trucks to be received and safely located away from the processing areas until the facility is ready to receive the delivered material.

The Profiled Waste Processing Building will be located between the existing Profiled Waste Receiving Warehouse and the tipping/refuse building and will be connected to the existing warehouse via forklift gallery. The building will be constructed of steel on a 5" slab on grade with individual footings for columns. The south side of the building will have a retaining wall because of the grade elevation changes on that side of the building. The building will be approximately 25' tall, and the roof will be supported by posts installed on the tipping building's concrete wall.

Within the Profiled Waste Processing Building, a trench and sump pump will be installed for safety and in the unlikely event of a spill of liquid material. The sump pump will route collected materials to the existing Liquid Direct Injection (LDI) system and then will be routed to one of the MWC units via the existing LDI system.

Conveyors will be installed that connect the Profiled Waste Processing Building with the Tipping Building and with the Refuse Building. The conveyors allow the containerized RMW material to be transferred from trucks to conveyors and then proceed directly to the hopper feed system above the three combustion units. Palletized Profiled Waste (Pit Feed) material will be placed on the conveyor from the unloading dock for transport to the vertical lift to the tipping building. The reusable containers returning from the RMW feed system are returned to the floor of the waste processing building.

The modifications to the Tipping Building and Refuse Building are associated with the roof of the Profiled Waste Processing Building and adjustments to columns (for access and support) and for delivery of material above the three combustion units.

The Staging parking area will be compacted crushed stone, asphalt, or concrete and located in the southeastern portion of the property and south of the exit ramp from the refuse building. Delivered material will pass through the gate house on the northeast side of the facility and complete its receiving inspection – radioactive survey, weight, manifest check, and other quality assurance activities as discussed in other sections of this application. If the delivered load is not to be immediately processed, the truck will be directed to the Staging parking area.

The parking area will be within the fenced area, and, in the event pathological waste or contaminated carcasses or body parts of animals intentionally exposed to pathogens in research, in the production of biologicals or the "in vivo" testing of pharmaceuticals is not processed within 24 hours of delivery, the waste will be refrigerated using the trailer's refrigeration system.

All RMW material will be processed within 96 hours of delivery or will be transferred to an alternative processing site.

Final engineering plans have not been completed as Covanta Tulsa is awaiting permitting approval to complete design work. All construction will be done in coordination with the City of Tulsa permitting process and will be sealed by Oklahoma-registered Professional Engineers.

Covanta has installed similar systems in Marion, Oregon; Lake County, Florida; Fairfax, Virginia; and Huntsville, Alabama and has confidence in the design engineers as well as the construction of the systems. These conveyor delivery systems have proven to be reliable and safe to operate.

#### C. Type of Wastes to be Processed

As described in **Appendices C and F,** the following RMW is proposed to be processed at Covanta Tulsa. There are many sources of medical wastes including hospitals, dental offices, veterinary clinics, and research institutes, among others. Non-hazardous RMW waste streams that will be accepted at the Tulsa Facility as part of Covanta Tulsa's Regulated Waste Program are as listed in OAC 252:515-1-2, OAC 252:100-17-9, and 40 CFR 60,51c except as noted herein.

#### 1. Acceptable Regulated Medical Waste (RMW)

OKDEQ 252:515-1-2: "Regulated medical waste" means a waste or reusable material that contains an etiologic agent and is generated in the diagnosis, treatment or immunization of human beings or animals; research pertaining to the diagnosis, treatment or immunization of human beings or animals; or the production or testing of biological products. Such waste includes, but is not limited to:

- a. Cultures and stocks of etiologic agents or live vaccines, and culture dishes, devices, paper, and cloth that has come into contact with such cultures, stocks or live vaccines;
- b. Human blood, blood products, and human body fluids, except urine or feces;
- c. Pathological wastes consisting of human tissues, organs, and body parts removed during surgery, autopsy, biopsy and other medical procedures;
- d. Untreated sharps;
- e. Used blood collection bags, tubes, and vials;
- f. Contaminated carcasses, body parts and bedding of animals intentionally exposed to pathogens in research, in the production of biologicals or the "in vivo" testing of pharmaceuticals;
- g. Items contaminated with blood or other human body fluids which drip freely or would release such materials in a liquid or semi-liquid state if compressed or are caked with dried blood or body fluids and are capable of releasing these materials;
- h. Isolation wastes unless determined to be non-infectious by the infection control committee at the health care facility;
- i. HIV-containing cell or tissue cultures, organ cultures, and HIV- or HBV-containing culture medium or other solutions; and blood, organs, or other tissues from experimental animals infected with HIV or HBV;
- j. All disposable materials that have come in contact with cytotoxic or antineoplastic agents during the preparation, handling, and administration of such agents. Such wastes include, but are not limited to, masks, gloves, gowns, empty IV tubing and bags, vials, and other contaminated materials; and
- k. Any other material or equipment which, in the determination of the health care facility staff, infection control committee or other responsible party, presents a significant danger of infection because it is contaminated with, or may reasonably be expected to be contaminated with, etiologic agents.

In addition, RMW at Covanta Tulsa includes "biomedical waste" as defined in OAC 252:100-17-9 and "Medical/Infectious Waste" as defined in 40 CFR 60.51c:

**OAC 252:100-17-9: Biomedical Waste.** medical/infectious waste as defined in 40 CFR 60.51c, chemotherapeutic waste and biomedical radioactive waste.

**40 CFR 60.51c Medical/Infectious Waste.** Any waste generated in the diagnosis, treatment, or immunization of human beings or animals, in research pertaining thereto, or in the production or testing of biologicals

that are listed in paragraphs (1) through (7) of this definition. The definition of medical/infectious waste does not include hazardous waste identified or listed under the regulations in part 261 of this chapter; household waste, as defined in § 261.4(b)(1)of this chapter; ash from incineration of medical/infectious waste, once the incineration process has been completed; human corpses, remains, and anatomical parts that are intended for interment or cremation; and domestic sewage materials identified in § 261.4(a)(1) of this chapter.

(1) Cultures and stocks of infectious agents and associated biologicals, including: cultures from medical and pathological laboratories; cultures and stocks of infectious agents from research and industrial laboratories; wastes from the production of biologicals; discarded live and attenuated vaccines; and culture dishes and devices used to transfer, inoculate, and mix cultures.

(2) Human pathological waste, including tissues, organs, and body parts and body fluids that are removed during surgery or autopsy, or other medical procedures, and specimens of body fluids and their containers.

(3) Human blood and blood products including:

(i) Liquid waste human blood;

(ii) Products of blood;

(iii) Items saturated and/or dripping with human blood; or

(iv) Items that were saturated and/or dripping with human blood that are now caked with dried human blood; including serum, plasma, and other blood components, and their containers, which were used or intended for use in either patient care, testing and laboratory analysis or the development of pharmaceuticals. Intravenous bags are also included in this category.

(4) Sharps that have been used in animal or human patient care or treatment or in medical, research, or industrial laboratories, including hypodermic needles, syringes (with or without the attached needle), Pasteur pipettes, scalpel blades, blood vials, needles with attached tubing, and culture dishes (regardless of presence of infectious agents). Also included are other types of broken or unbroken glassware that were in contact with infectious agents, such as used slides and cover slips. (5) Animal waste including contaminated animal carcasses, body parts, and bedding of animals that were known to have been exposed to infectious agents during research (including research in veterinary hospitals), production of biologicals or testing of pharmaceuticals.

(6) Isolation wastes including biological waste and discarded materials contaminated with blood, excretions, exudates, or secretions from humans who are isolated to protect others from certain highly communicable diseases, or isolated animals known to be infected with highly communicable diseases.

(7) Unused sharps including the following unused, discarded sharps: hypodermic needles, suture needles, syringes, and scalpel blades.

Thus, acceptable RMW additionally includes the following:

- I. Trace chemotherapeutic waste
- m. Unused sharps, including the following unused discarded sharps: hypodermic needles, suture needles, syringes, and scalpel blades

Covanta Tulsa has identified the following RMW which are not accepted at the Covanta Tulsa facility:

- a. Human fetal tissue.
- b. Any type of RMW generated by or originating from an outpatient medical facility or clinic that provides abortion services.
- c. Large Pathological Waste (for example, torsos, heads, or large animal carcasses).

#### D. Expected Waste Volume and Measurement

As discussed previously in this Application, Covanta will limit the amount of RMW processed at the Tulsa Facility to 40,000 tons per year. The RMW material will be considered non-MSW material and will represent a portion of the non-MSW combusted at the facility. The RMW process rate will be recorded daily and provided in the monthly/quarterly reports as required. Covanta will continue to comply with the recordkeeping requirements contained in both the Air Quality and the Solid Waste permits for the facility. All RMW waste loads must be scheduled. Weights of scheduled RMW waste trucks will be used to calculate a daily feed rate.

#### E. Waste Evaluation Procedures

The operators will load the MWC feed hoppers taking into account the need to balance and blend the RMW materials with MSW and other approved waste streams to provide a consistent waste feed stream to the furnace. The proposed processing and disposal of RMW at the Tulsa Facility will be accomplished in a manner protective of public health. This reasonable assurance is based upon plans, test results, installation of control equipment, or other information, that the construction, expansion, modification, operation, or activity of the installation will not discharge, emit, or cause pollution in contravention of ODEQ's regulations.

To ensure all materials accepted for treatment or other processing at the Covanta Tulsa facility are managed in accordance with applicable regulations, the waste generator must complete a Material Characterization Form and certify the waste falls within the Facility's treatability and handling parameters. If it is determined the waste stream is acceptable, a unique profile number is assigned to each waste stream. The Waste Exclusion Plan (**Appendix F**) includes copies of the Material Characterization Form required as part of the evaluation process.

A robust QA/QC program (see **Appendix I**) has been established to minimize risk and ensure that all shipments of RMW to Covanta Tulsa meet specifications.

Components of the QA/QC program include:

- Completion of a Material Characterization Form (MCF).
- Submission of extensive supplemental operational and generator related information for RMW approval.
- The execution of an RMW-specific service agreement which also includes a provision allowing Covanta to inspect any upstream RMW generator of our customer.
- Customer site audits consisting of an initial audit, a recertification audit and corrective action site audit if required.
- QA/QC inspections occur at the Covanta Tulsa facility for RMW load deliveries.
- Discrepancies identified during load inspections are reported to the customer. Reports are used to identify a root cause of the discrepancy and implementation of corrective action.

#### F. Contingency Plan

In the event of an emergency or unplanned shutdown that precludes the processing of RMW at Covanta Tulsa in a timely manner, all wastes will be directed to an alternate Covanta facility or to a third-party facility permitted to receive and treat such materials. All customers will be notified, and assistance will be provided to reroute waste. During a shutdown period, all equipment will be idled and remain de-energized. All storage containers will be emptied. Operations will not resume until proper management of the waste can be maintained. **Appendix C** provides additional details related to site operations that address specific concerns related to storage, inspection, and packaging.

#### G. Control Procedures

#### 1. Noise

The RMW processing conveyors are located within the Profiled Waste Processing Building or the existing Refuse Floor and Tipping buildings. The conveyors and elevators are located indoors and thus do not contribute to noise concerns for adjacent properties.

As the RMW represents a component of the non-MSW waste processed at the Facility, there will be no increase in truck traffic to the Facility as a result of this permit modification.

Covanta Tulsa is located in an industrial area, and each of the adjacent properties conduct manufacturing and trucking operations.

#### 2. Vectors

Vector-control of potential pests is unlikely to be necessary as the waste materials are stored indoors in sealed containers prior to delivery to the MWC units. Further, the material is onsite for a short duration prior to treatment.

Pathogens are controlled via the waste handling procedures as detailed in the SOP in **Appendix C** and discussed earlier in this application.

#### 3. Litter

All treatment and processing operations are performed within the buildings. RMW material is delivered in sealed containers and handled so that the material remains unbroken. Litter is not expected to be a concern for this permit modification.

#### 4. Dust

Based on experience with operating similar facilities, dust does not represent a concern for facility operations. The limited truck traffic will be located on concrete drives, and good housekeeping measures at the Facility include periodically sweeping and cleaning roadways. The Staging area will be constructed using compacted crushed stone, concrete, or asphalt. The waste materials themselves are confined within boxes, and the delivery of those boxes to the charging floor will not create dust.

#### H. Air Emissions

#### 1. Continuous Emissions Monitoring Systems

The Facility is equipped with a state-of-the-art Continuous Emissions Monitoring System (CEMS) to continuously extract and analyze exhaust gases to monitor for complete combustion, including the following compounds: carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), oxides of nitrogen (NOx), and oxygen (O<sub>2</sub>), along with Opacity

via a Continuous Opacity Monitor (COMS). The CEMS and COMS systems are calibrated on a daily, quarterly, and annual basis using prescribed USEPA QA/QC procedures. Measurements made by the individual gas analyzers are transmitted to a Data Acquisition System (DAS) where they are calculated into the appropriate averaging periods prescribed by the Title V operating permit for the Facility and underlying regulations.

#### 2. Periodic Stack Testing

The Facility, in its Title V Operating Permit, is required to conduct an annual compliance test (or "stack test") to demonstrate compliance with the emissions limits imposed by 40 CFR 60, Subpart Cb and the ODEQ. The RMW processing rate, expressed as tons RMW processed divided by total tons of waste processed during the stack test will be determined for each stack testing event. The following pollutants are sampled and analyzed using methods prescribed by the Title V operating permit and the underlying regulations: particulate matter (PM), dioxins/furans (PCDD/PCDF), hydrogen chloride (HCI), lead (Pb), cadmium (Cd), and mercury (Hg). Biennially, the facility also tests for VOC, Beryllium, Fluorides, and Sulfuric acid. Stack testing requirements will be established through the Air Quality Division of the Oklahoma Department of Environmental Quality.

#### 3. Design Parameter - Combustion Condition

The Covanta facilities at which RMW is combusted together with MSW are designed such that a minimum combustion zone temperature of 1,800°F is maintained for a residence time of 1 second.

#### 4. Design Parameter - Air Lock System

The mechanically-fed waste combustion units incorporate an air lock system. The waste feed chute and the ash dischargers ensure the furnace is sealed from the outside at both the waste inlet and residue outlet.

#### 5. Operating Practice - Best Management Practices

To ensure good mixing with MSW, operators use best management practices when combusting RMW together with MSW as defined in the Covanta Tulsa RMW SOP (see **Appendix C**).

## 6. Operating Practice - MWC Unit Startup, Shutdown, Malfunction Procedures

The firing of RMW will not be done during startup or shutdown periods of an MWC unit. As noted in the SOP in **Appendix C**, units must be online for a minimum of four hours and have stable combustion before feeding RMW. All air preheater coils will be in operation prior to starting the feed of RMW to an MWC unit and will be operated continuously during the combustion of RMW. All APC equipment and

CEM/COM equipment will be operational and functioning properly prior to the introduction of RMW to a unit. If a malfunction occurs, RMW feed will cease and not restart until the malfunction has been rectified.

#### 7. Operating Practice - RMW Feed System

An automated hopper feed system will be constructed to transfer RMW from the Profiled Waste Processing Building directly to the waste feed chutes of the three MWC units.

#### 8. Operating Practice - Good Combustion Practices

All the combustibles in the RMW placed into the furnace must be completely combusted prior to removal from the furnace for further processing, such as ash handling and landfilling. The Tulsa Facility will continue to operate utilizing the Good Combustion Practices included in 40 CFR 60, Subparts Cb including CO limits, steam flow limits and fabric filter inlet temperature limits.

#### 9. Emission Standards and Limitations

The emission standards for MWC Units 1, 2, and 3 contained in the Title V Operating Permit for the Facility are not changed under this project. The current ODEQ Air Quality Permit is included in **Appendix K**.

#### I. Spills

RMW may be stored for a short time in the Staging Area prior to being offloaded and processed. While in the secure Staging Area, the waste material remains within the trailer in which it was transported.

All waste unloading, storage, and processing will be completed within the receiving, processing, or tipping/charging buildings. Any spilled material contained within the buildings will immediately be cleaned up and any spilled material will be properly managed per the Covanta Tulsa RMW SOP. A trench and sump within the Profiled Waste Processing Building is routed to the existing LDI treatment system to completely contain any incidental leakage.

All personnel are properly trained to minimize the risk of a spill and are trained on the proper clean up procedures when an unexpected release occurs. Spill clean-up kits will be located within the receiving and processing buildings. These kits contain a variety of spill clean-up materials.

#### J. Fire Protection

The Profiled Waste Processing Building will be equipped with a fire sprinkler system suitable for the building's occupancy and use. CO<sub>2</sub> fire extinguishers are located throughout the Facility and marked for easy access by all employees.

#### K. Daily Clean Up Procedures

Daily housekeeping activities include sweeping, picking up any garbage, and squeegeeing any accumulated water.

#### L. Sanitary Facilities for Employees

Restroom facilities are provided in the main production Facility.

#### M. Operating Hours

The Facility employs 57 people, and the RMW operation will be staffed with approximately two people five to seven days per week. The Facility is permitted to operate 24 hours/day, 7 days/week, and shift work is anticipated. Primarily, the first shift will be receiving loads and processing materials, and the second shift will complete processes and prepare for the next day's operation. All waste receipts are scheduled which allows for adequate and flexible staffing.

#### N. Emergency Response Plan

The Emergency Response Plan is detailed in Section 4.4 of **Appendix C**. The plan specifies the procedures to follow in sudden unexpected situations, such as a fire, spill or weather-related emergency. It assigns roles and responsibilities for implementation of the plan during an emergency.

#### VI. Safety

#### A. Personal Protective Equipment

Personal protective equipment to be used within the facility includes safety glasses, steel toed boots, nitrile gloves, regular work gloves, laundered uniforms. Hearing protection, respiratory protection and confined space entry equipment are used when necessary.

A first aid kit is located in the office.

#### B. Decontamination

A shower and eye wash station will be installed in each of the Profiled Waste Receiving and Processing Buildings. Equipment decontamination will be performed through the facility housekeeping and maintenance program.

#### C. On-Site Communication

All employees carry radios to communicate with other employees and office staff. A Landline telephone is also located in the office area of the facility.

#### D. Access Control

Strict access control to the Facility will be maintained. The property is fully fenced with 6foot chain link fencing. Access to the facility is through two driveways, which are gated. There are no common driveways or parking lots with other facilities. A video surveillance system will be installed for the Staging area and the Profiled Waste Processing Building. The entrance gate for the Staging area and all doors to the Profiled Waste Processing and Receiving Buildings will be locked during non-operating hours.

#### E. Employee Shelter

In the event of inclement weather employees will shelter in the restrooms. Equipment protection is not anticipated.

#### VII. Recordkeeping

All facility records are maintained electronically. All waste loads are tracked from the time it is delivered to the Facility, received, and processed.

The following are examples of the types of information maintained:

- All loads received including date, generator, manifest number, waste profile number, gallons, and treatment documentation
- Waste screening results
- All Generator's Waste Certification Statements along with analytical test results
- Inventory of treatment chemicals

Final closure records shall be maintained on file within Covanta Tulsa Renewable Energy LLC until ODEQ approves final closure.

#### VIII. Training

Training is an essential component of the Covanta RMW program and mitigates the risk of exposure to any of the hazards associated with the processing of RMW. Initial operator training will be conducted by a competent individual for any employee who will be working directly with RMW prior to performing the functions of this job. Recurrent training will be provided on an annual basis.

Operators of the Tulsa Facility have been trained in accordance with the Municipal Waste Combustor Operator Training Program developed by the USEPA in support of improving the air pollution control practices at MWCs. The USEPA was required to develop a model state training and certification program for solid waste incinerator operators under Title 111 of Section 129 of the Clean Air Amendments of 1990. In accordance with State of Oklahoma regulations, all chief and shift operators are required to be certified by the Commissioner. Operators must satisfactorily complete an operator training course conducted by the Commissioner.

Given the potentially infectious characteristics of some RMW, it is important that facility operators be properly trained and qualified prior to any combustion of RMW at the Facility. Although the federal Hospital, Medical and Infectious Waste Incinerator (HMIWI) rules do not apply to the MWC units at the Facility, Covanta models portions of its training program on these best practices. Employee training includes the following topics. The training includes in-person coursework, distribution of reference material, and an examination designed and administered by the instructor to ensure the trainees have been properly trained. Records are maintained at the Facility and are available for review upon request.

#### (a) 24 hours of training related to RMW Waste Processing:

- Environmental concerns, including pathogen destruction and types of emissions;
- Basic combustion principles, including products of combustion;
- Operation of the type of incinerator to be used by the operator, including proper startup, waste charging, and shutdown procedures;
- Combustion controls and monitoring;
- Operation of air pollution control equipment and factors affecting performance;
- Methods to monitor pollutants and equipment calibration procedures;
- Inspection and maintenance of the waste handling equipment, combustion equipment, air pollution control devices, and continuous emission monitoring systems;
- Actions to correct malfunctions or conditions that may lead to malfunction;
- Ash characteristics and handling procedures;
- Applicable Federal, State, and local regulations;
- Work safety procedures;
- Pre-startup inspections; and
- Recordkeeping requirements.

#### (b) Related Topics:

- Facility Emergency Response Procedures
- Stormwater Permit Requirements
- Waste Certification Process
- Hazard Communication
- Confined Space Entry
- Respiratory Protection
- Exposure Control
- Lock Out/Tag Out
- Personal Protective Equipment
- Security Site Safety
- Fire Prevention and Protection
- WEP and NHIW Training
- Operating Procedures

More detailed information regarding the training programs is available in Section 6 of the Waste Exclusion Plan **(Appendix F)** and section 4.7 of the Standard Operating Procedures **(Appendix C)**.

#### IX. Construction Activities

The construction of the site includes the following activities:

- Staging Area and associated security gates and stormwater connections to the stormwater detention pond (F02)
- Concrete interior processing areas of the building
- Conveyor installations
- Elevator installations
- Finish interior of the Processing Building
- Loading docks
- Lighting and Emergency notification system
- Stormwater routing in the area of the Staging Area and Profiled Waste Processing Building

The Construction will be subject to permitting with the City of Tulsa. Conceptual drawings as currently available are provided in **Appendix E.** Records concerning the planning, construction, operation, and closure activities will be maintained at the Covanta Tulsa facility.

#### X. Summary

As demonstrated within this application, Covanta Tulsa has provided the information supporting its request for a modification to its Solid Waste permit to allow processing Regulated Medical Waste. The Facility has been designed and will be operated with environmental protection and safety priorities. This Application documents the design, operational plans, and closure activities for the Facility as well as the means and methods by which the requirements of Oklahoma Administrative Code 252 Chapter 515 are achieved. **Appendix O** provides a detailed regulatory-applicability review along with a completed Solid Waste Processing Facility Permitting Checklist. Covanta Tulsa looks forward to working with the Oklahoma Department of Environmental Quality as a draft permit is proposed.



## National Flood Hazard Layer FIRMette



#### Legend

#### 96°1'22"W 36°8'9"N SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT Without Base Flood Elevation (BFE) Zone A. V. A9 With BFE or Depth Zone AE, AO, AH, VE, AR SPECIAL FLOOD HAZARD AREAS **Regulatory Floodway** 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X T19N R12E S10 Future Conditions 1% Annual Chance Flood Hazard Zone X Area with Reduced Flood Risk due to Levee. See Notes. Zone X OTHER AREAS OF FLOOD HAZARD Area with Flood Risk due to Levee Zone D NO SCREEN Area of Minimal Flood Hazard Zone X Effective LOMRs OTHER AREAS Area of Undetermined Flood Hazard Zone D - — – – Channel, Culvert, or Storm Sewer GENERAL 0.2 PCT ANNUAL CHANCE FLOOD HAZARD STRUCTURES LIIII Levee, Dike, or Floodwall Zone X 20.2 Cross Sections with 1% Annual Chance CITY OF TULSA 17.5 Water Surface Elevation 405381 **Coastal Transect** Mase Flood Elevation Line (BFE) Limit of Study Jurisdiction Boundary **Coastal Transect Baseline** OTHER Profile Baseline 40143C0220I FEATURES Hydrographic Feature eff. 10/16/201 **Digital Data Available** No Digital Data Available T19N R12E S15 MAP PANELS Unmapped 5 The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location. TULSA COUNTY 639.06 FEET This map complies with FEMA's standards for the use of 400462 digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map 639:2 FEE was exported on 12/27/2022 at 1:36 PM and does not Zone AE -639-13 FEET reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time. This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for 96°0'45"W 36°7'40"N Feet 1:6.000 unmapped and unmodernized areas cannot be used for regulatory purposes. 250 500 1,000 1,500 2.000 n

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020



#### 252:515-3-54(b)(4) and (5)

## ArcGIS Web Map



OpenStreetMap, Microsoft, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS,



## ArcGIS Web Map



#### 12/27/2022, 4:06:35 PM

- Groundwater Wells
- \_\_\_\_ Municipal Boundaries
- \_\_\_\_ Sections
  - Townships

North



City of Tulsa, Texas Parks & Wildlife, Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA, EPA, USDA



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http://www.cardinalengineers.com CA# 2054, expiration date 06.30.2013


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# Proposed Site Plan from LDI Project 2013

# PAVING QUANTITIES

7" CONCRETE PAVING: 1932 SY 10" SUBGRADE: 2102 SY

GNATURE/SEAL <u>06/04/2013</u> DATE PROJECT COVANTA SCALE AND DRIVEWAY CONSTRUCTION LOCATION 2122 S. YUKON AVE. TULSA, OK 74107 PREPARED FOR COVANTA RAWING TITLE PROPOSED SITE PLAN 11150 CC awn B WRS ecked 6/4/2013 AS SHOWN ssued For BIDDING AND CONSTRUCTION iwina Nc **၂**-

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Description



UTILITY WARNING:

THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM RECORD DOCUMENTS OR FIELD LOCATIONS BY THE OPERATOR. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH THE SURVEYOR DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM THE INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.

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http://www.cardinalengineers.com CA# 2054, expiration date 06.30.2013

E N G I N E E R I N G

7136 South Yale Ave., Suite 120

Phone/Fax: 918.895.9766

Tulsa, OK 74136





UTILITY WARNING:

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# Existing Contour Map 252:515-3-55(a), (b) and (c) Item 31





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3226 Bart Conner Drive Norman, OK 73072 Phone 405.579.0655 Fax 405.366.8540 http://www.cardinalengineers.com

## APPLICATION TO MODIFY A SOLID WASTE DISPOSAL FACILITY PERMIT

Send to: Solid Waste Permitting Unit Land Protection Division Dept. of Environmental Quality 707 N. Robinson (PO Box 1677) Oklahoma City, OK 73101-1677	FOR DEQ USE    DEQ Log No.
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## Legal Description:

Northerly nine hundred feet (900') of the easterly one thousand eighty five feet (1085') of NW 1/4 of the NE 1/4 of Section 15 Township 19 North Range 12 East Tulsa County, Oklahoma

# COVANTA

Covanta Tulsa

# **Regulated Medical Waste Processing**

# Standard Operating Procedure

# Pre-Permit DRAFT



**REVISION NO: 4** 

**REVISION DATE: October 5, 2023** 

# Table of Contents

1.	PURPOSE	5
2.	SCOPE	5
3.	DEFINITIONS	5
4.	PROCEDURE	7
4.1	Understanding Regulated Medical Waste	7
	4.1.1 Defining Regulated Medical Waste	7
	4.1.2 Workplace Safety	. 10
	4.1.3 Department of Transportation (DOT)	. 10
	4.1.3.1 Division 6.2 Requirements	. 10
4.2	Management of Characterized Regulated Medical Waste	. 11
	4.2.1 Supplemental Approval Requirements for Regulated Medical Waste	. 11
	4.2.2 Audit Techniques	12
4.3	Packaging Types and Composition	12
4.4	Receiving, Handling, Storage, Destruction and Monitoring	. 15
	4.4.1 Receiving and Handling	. 15
	4.4.1.1 Automated Feed System (AFS) Operation Procedure	. 15
	4.4.1.2 Reusable Containers	. 16
	4.4.1.3 Single-use Containers	. 16
	4.4.2 Storage	. 16
	4.4.3 Destruction	. 17
	4.4.3.1 Initiation of RMW Processing	. 18
	4.4.3.2 Controlled Shutdown	. 18
	4.4.3.3 Emergency Shutdown (Potential of Unprocessed RMW/MSW on Grate Surface)	. 18
	4.4.4 Monitoring	. 18
	4.4.5 Risk and Awareness	. 19
11	entrolled Conv. if Drinted Devicion: 10/5/2022	

	4.4.6	Contingency Planning	19
	4.4.	6.1 Over-Packing	20
	4.4.	6.2 Decontaminating Vehicles and Containers	20
	4.4.	6.3 Safely Storing Improper Wastes and Poorly-Packaged Wastes	20
	4.4. duri	6.4 Procedures for Re-Packaging Defective, Problematic or Leaking Waste Containers Detected ng Visual Inspection	20
	4.4.) Oth	6.5 Alternative Management of Wastes in the Event of Equipment Malfunction, Emergencies or er Unforeseen Situations	20
4.5	Haza	ards and Risk Mitigation	21
	4.5.1	Biological	21
	4.5.2	Chemical	21
	4.5.3	Physical	22
4.6	Con	trols and Exposure Control Plan 1910.1030(c)	22
	4.6.1	RMW Spill Clean up (See Appendix C – Approved PPE and Supplies)	22
	4.6.2	Engineering Controls	23
	4.6.3	Administrative Controls	23
	4.6.4	Personal Protective Equipment	24
	4.6.5	Hazard Analysis	24
	4.6.6	Exposure Determination	24
	4.6.7	Hepatitis B Vaccine	24
	4.6.8	Post Exposure Evaluation	25
4.7	Trai	ning	25
	4.7.1	Requirements	25
4.8	Reco	ordkeeping	25
5.	REFER	ENCES	25
Rev	ision H	istory	26
Арр	endix /	A. Covanta Acceptable and Unacceptable Regulated Medical Wastes (RMW)	27

Appendix B. EXPOSURE AND JOB CLASSIFICATION	29
Appendix C: Approved PPE and Supplies	30

## 1. **PURPOSE**

The purpose of this standard operating procedure (SOP) is to define the types of Regulated Medical Waste (RMW) that are accepted at Covanta Tulsa, identify applicable regulatory standards and definitions, and detail the training of personnel handling RMW on hazard recognition and risk mitigation. The SOP is focused on the safe handling and processing of RMW to ensure employee safety, health and environmental compliance are never jeopardized. Covanta reserves the right to reject any shipment of RMW deemed unsafe for processing.

## 2. SCOPE

Subsequent to successful permitting activities, Covanta Tulsa will be authorized by a modified Title V Permit #2014-1722-TVR (M-1) and Solid Waste Permit #3572033 to process Regulated Medical Waste (RMW) at the Facility with MSW in MWC Units 1, 2, and 3. This permit allows a total of 40,000 tons per year of RMW to be processed at the Facility which represents less than 10% of the permitted capacity of the facility. These conditions are in addition to all other applicable permit conditions and regulations for these emissions units.

The Facility is subject to all applicable provisions of 40 CFR 60, Subparts A, Cb and Oklahoma Administrative Code (OAC) 252:515 and 252:100.

This procedure is for receiving, processing, and treating RMW at the Facility. Contingency plans associated with these activities are also detailed.

## 3. **DEFINITIONS**

**Aerosolization:** Production of airborne particles (e.g. tiny liquid droplets). Aerosolization of a contaminated material or RMW can cause exposure if the material aerosolized contains an infectious virus or bacteria.

**Blood borne pathogen:** Infectious microorganisms in human blood that can cause disease in humans. These pathogens include, but are not limited to, hepatitis B (HBV), hepatitis C (HCV) and human immunodeficiency virus (HIV).

**Chemotherapeutical:** *Items used in the administering of or relating to chemotherapy.* 

**Cultures and stocks:** Infectious agents or biologicals -cultures from medical and pathological labs; cultures and stocks of infectious agents from R&D labs; discarded live or dead vaccines, dishes or devices used to transfer, inoculate, and mix.

**Decontamination:** A specific documented process of removing or neutralizing contaminants that have accumulated on personnel and equipment.

**DOT:** Department of Transportation.

**EPA:** Environmental Protection Agency.

**Gaylord:** Bulk boxes, often made of corrugated double wall or triple wall fiberboard, the construction for RMW of which is regulated under 49 CFR 172-3.

**Hazard Class 6.2:** Biohazardous / Infectious substances; the World Health Organization (WHO) divides this class into two categories: **Category A**: Infectious; and **Category B**: Samples (virus cultures, pathology specimens, used intravenous needles).

**HAZWOPER:** Hazardous Waste Operations and Emergency Response is a series of OSHA guidelines and requirements for the safe handling and emergency response of hazardous wastes. See 49 CFR 1910.120.

**Hepatitis B (HEP B):** A severe form of viral hepatitis transmitted in infected blood, causing fever, debility, and jaundice.

**Hepatitis C (HEP C):** A form of viral hepatitis transmitted in infected blood, causing chronic liver disease.

**Hepatitis A (HEP A):** Vaccine-preventable, communicable disease of the liver caused by the hepatitis A virus (HAV).

**HIV:** Human Immunodeficiency Virus; HIV attacks the body's immune system and destroys the body's ability to fight off infection or disease. No effective cure for HIV currently exists.

**Infectious waste:** Any biological, pathological waste containing laboratory, culture or stocks, tissues, body fluid containing items, sharps, tubing, clean up items or pharmaceuticals in some situations.

**Manifest/Bill of Lading:** A traceable document issued by a carrier to acknowledge receipt of cargo for shipment.

**Municipal Waste Combustion:** *Waste to Energy (WTE) operations which achieve temperatures greater than 2500°F*.

**ODEQ:** Oklahoma Department of Environmental Quality.

**OSHA:** Occupational Safety and Health Administration.

Pathological wastes: See Section 4.1.1, 40 CFR 60.51c(2) below.

**PHMSA:** Pipeline and Hazardous Materials Safety Administration (PHMSA)-a US Department of Transportation agency responsible for developing and enforcing transport regulations.

**RCRA:** Resource Conservation and Recovery Act (RCRA) - regulations for the cradle-to-grave management of hazardous waste including generation, transportation, treatment, storage, and disposal.

**RMW:** Regulated Medical Waste.

**Rotonic:** *Trade name for reusable bin/container.* 

**Sharps:** form of medical waste composed of used sharps, any device or object that puncture or lacerate the skin; blades, needles, razors, knives, scissors etc.

**Trace chemotherapeutic waste:** *Chemotherapy waste that is < 3% by volume.* 

WEP: Waste Exclusion Plan

## 4. PROCEDURE

### 4.1 Understanding Regulated Medical Waste

There are many sources of medical wastes including hospitals, dental offices, veterinary clinics, and research institutions, among others. Additionally, several processes for treating medical waste to render it non-infectious exist, including steam sterilization, microwaving, irradiation, chemical disinfection and incineration. The focus of this procedure will be directed at thermally processing RMW.

#### 4.1.1 Defining Regulated Medical Waste

Covanta Tulsa will be managing RMW processing at the Tulsa, OK location per all applicable regulatory requirements. As a solid waste processing facility, RMW at Covanta Tulsa is defined per OAC 252:515-1-2:

**Regulated Medical Waste** means a waste or reusable material that contains an etiologic agent and is generated in the diagnosis, treatment or immunization of human beings or animals; research pertaining to the diagnosis, treatment or immunization of human beings or animals; or the production or testing of biological products. Such waste includes, but is not limited to:

- a. Cultures and stocks of etiologic agents or live vaccines, and culture dishes, devices, paper, and cloth that has come into contact with such cultures, stocks or live vaccines;
- b. Human blood, blood products, and human body fluids, except urine or feces;
- c. Pathological wastes consisting of human tissues, organs, and body parts removed during surgery, autopsy, biopsy and other medical procedures;
- d. Untreated sharps;
- e. Used blood collection bags, tubes, and vials;
- f. Contaminated carcasses, body parts and bedding of animals intentionally exposed to pathogens in research, in the production of biologicals or the "in vivo" testing of pharmaceuticals;
- g. Items contaminated with blood or other human body fluids which drip freely or would release such materials in a liquid or semi-liquid state if compressed or are caked with dried blood or body fluids and are capable of releasing these materials;
- h. Isolation wastes unless determined to be non-infectious by the infection control committee at the health care facility;

- i. HIV-containing cell or tissue cultures, organ cultures, and HIV- or HBVcontaining culture medium or other solutions; and blood, organs, or other tissues from experimental animals infected with HIV or HBV;
- j. All disposable materials that have come in contact with cytotoxic or antineoplastic agents during the preparation, handling, and administration of such agents. Such wastes include, but are not limited to, masks, gloves, gowns, empty IV tubing and bags, vials, and other contaminated materials; and
- k. Any other material or equipment which, in the determination of the health care facility staff, infection control committee or other responsible party, presents a significant danger of infection because it is contaminated with, or may reasonably be expected to be contaminated with, etiologic agents.

In addition, RMW at Covanta Tulsa includes "biomedical waste" as defined in OAC 252:100-17-9 and "Medical/Infectious Waste" as defined in 40 CFR 60.51c:

**OAC 252:100-17-9: Biomedical Waste.** Medical/infectious waste as defined in 40 CFR 60.51c, chemotherapeutic waste and biomedical radioactive waste.

**40 CFR 60.51c Medical/Infectious Waste.** Any waste generated in the diagnosis, treatment, or immunization of human beings or animals, in research pertaining thereto, or in the production or testing of biologicals that are listed in paragraphs (1) through (7) of this definition. The definition of medical/infectious waste does not include hazardous waste identified or listed under the regulations in part 261 of this chapter; household waste, as defined in § 261.4(b)(1) of this chapter; ash from incineration of medical/infectious waste, once the incineration process has been completed; human corpses, remains, and anatomical parts that are intended for interment or cremation; and domestic sewage materials identified in § 261.4(a)(1) of this chapter.

(1) Cultures and stocks of infectious agents and associated biologicals, including: cultures from medical and pathological laboratories; cultures and stocks of infectious agents from research and industrial laboratories; wastes from the production of biologicals; discarded live and attenuated vaccines; and culture dishes and devices used to transfer, inoculate, and mix cultures.

(2) Human pathological waste, including tissues, organs, and body parts and body fluids that are removed during surgery or autopsy, or other medical procedures, and specimens of body fluids and their containers.

(3) Human blood and blood products including:

(i) Liquid waste human blood;

(ii) Products of blood;

(iii) Items saturated and/or dripping with human blood; or

(iv) Items that were saturated and/or dripping with human blood that are now caked with dried human blood; including serum, plasma, and other blood components, and their containers, which were used or intended for use in either patient care, testing and laboratory analysis or the development of pharmaceuticals. Intravenous bags are also included in this category.

(4) Sharps that have been used in animal or human patient care or treatment or in medical, research, or industrial laboratories, including hypodermic needles, syringes (with or without the attached needle), Pasteur pipettes, scalpel blades, blood vials, needles with attached tubing, and culture dishes (regardless of presence of infectious agents). Also included are other types of broken or unbroken glassware that were in contact with infectious agents, such as used slides and cover slips.

(5) Animal waste including contaminated animal carcasses, body parts, and bedding of animals that were known to have been exposed to infectious agents during research (including research in veterinary hospitals), production of biologicals or testing of pharmaceuticals.

(6) Isolation wastes including biological waste and discarded materials contaminated with blood, excretions, exudates, or secretions from humans who are isolated to protect others from certain highly communicable diseases, or isolated animals known to be infected with highly communicable diseases.

(7) Unused sharps including the following unused, discarded sharps: hypodermic needles, suture needles, syringes, and scalpel blades.

Thus, acceptable RMW additionally includes the following:

- 1. Trace chemotherapeutic waste
- m. Unused sharps, including the following unused discarded sharps: hypodermic needles, suture needles, syringes, and scalpel blades

Covanta Tulsa, in Appendix B of this document and as included in the WEP, has identified the following RMW which are <u>not</u> accepted at the Covanta Tulsa facility:

- a. Human fetal tissue,
- b. Any type of RMW generated by or originating from an outpatient medical facility or clinic that provides abortion services,
- c. Large Pathological Waste (for example, torsos, heads, or large animal carcasses), or

#### 4.1.2 Workplace Safety

Covanta has developed and trained employees whose job entails directly processing medical waste or working in or around equipment that is used to process medical waste. All employees are trained on the Facility Emergency Action Plan.

#### **4.1.3** Department of Transportation (DOT)

The DOT is a governing body that develops and enforces the regulations for the safe transport of hazardous materials. RMW is considered a hazardous material and is categorized as a Division 6.2, Category B Infectious Substance<sup>1</sup>. Materials in this category are universally recognized by the biohazard symbol below:



#### 4.1.3.1 Division 6.2 Requirements

**Placarding.** Trailers transporting Infectious Substances are not required by law to have a universal biohazard Class 6 placard, however it is noted as a best practice, if observed. Trailers must have a UN3291 placard present.

<sup>&</sup>lt;sup>1</sup> DOT 49 CFR 173.134 – Division 6.2. Infectious Substance. A regulated medical waste means a waste or reusable material, other than a culture or stock of an infectious substance that contains an infectious substance and is generated in the diagnosis, treatment or immunization of human beings or animals; Research pertaining to the diagnosis, treatment or immunization of human beings or animals; or production or testing of biological products.

**Identification Number.** While trailers are not required to display a Class 6 biohazard placard, they are required to identify the hazardous material if it is parked at a location other than the generating or carrier facility. Identification of RMW can include a rectangle placard with UN3291 in black print with an orange background or a diamond placard with black print on a white background, such as below.



**Shipping Name.** RMW ships under the formal name: UN3291 Regulated Medical Waste, N.O.S. – if not otherwise specified.

**Packaging Integrity** (49 CFR 173.197). Characteristic requirements of RMW packaging include:

- Rigid containment
- Leak resistant
- Impervious to moisture
- Burst, tear, and break resistant
- Puncture resistant for sharps
- Sealed to prevent leaks
- Meets UN PG II specifications of 49 CFR 178

**Paperwork.** Covanta requires the following paperwork to accompany each shipment of RMW. No load will be accepted without all required paperwork.

- Pre-shipment Notification
- Shipping Manifest or Bill of Lading (BOL)
- Certification of Non-Hazardous Waste

## 4.2 Management of Characterized Regulated Medical Waste

#### 4.2.1 Supplemental Approval Requirements for Regulated Medical Waste

Prior to receiving RMW, a prospective customer completes paperwork (including the Material Characterization Form and the Supplemental Approval Requirements Form (**Appendix Q**)) required by Covanta. Upon completion, the waste is identified with a unique approval number, with specific terms and conditions that must be met for shipments under that approval number. The waste profile is reviewed by a Covanta Material Profile Specialist.

The Material Characterization Form describes shipping information, process description of how the waste was generated, regulatory waste classification, physical characteristics, composition, and a non-hazardous waste certification.

#### 4.2.2 Audit Techniques

**Internal QA/QC Inspections**. To ensure RMW waste is received as identified in the *Material Characterization Form (MCF) and RMW Opportunity Management (Audit).* Covanta utilizes a software platform to capture inspections of RMW. Knowledgeable staff who are proficient with regulatory and Covanta requirements for acceptance, inspect incoming shipments of RMW and record results in the software. When shipments are inspected, the material's description, manifest and/or BOL number, and generator are recorded into a QA/QC detail record.

*Contingency*: If a shipment of RMW is inspected and a discrepancy or incident arises, a discrepancy report is filed to capture the problem. Discrepancies are less severe than incidents and can include shifted loads, improper labeling or missing documentation, for example. Incidents typically require timely action to remedy the situation and often include spills, delivery of unapproved materials, poor containment; e.g., a dusty load of powder material. Discrepancy reports are automatically forwarded to site management, account representatives, and material approval personnel with responsibility for that particular approval. See *WEP Section* 5.0 - Inspection Procedures and Section <math>7.0 - Rejected Waste Procedures for additional information.

**External QA/QC Audits**. Covanta staff audits RMW customer waste generating transfer, or consolidation sites. Audits focus on compliance with approval agreements as well as continual improvement. Sites with more frequent discrepancies may be audited more often than sites which have infrequent discrepancies with their shipments. These audits may be done remotely or in person.

#### 4.3 Packaging Types and Composition

Packaging of RMW is based on regulatory requirements found in 49 CFR 172. The types of packaging illustrated below are a general compilation of approved waste and container types. These packages are inspected for integrity, condition, labeling, and containment. This list of container types is not all inclusive. Additional containers may be used provided they meet DOT and Covanta operations requirements.

Container	Acceptable Waste
	Sharps Container: Blades, needles, broken glass, ampules, and plastic.
	Rotonics Container: Infectious waste, blood products, IV tubing, cultures, stocks, contaminated PPE, gauze and dressings, non-RCRA pharmaceuticals, and trace chemotherapy waste.
N	Trace Chemo Container: PPE Gowns, sharps, and IV tubing.
	<b>Pharmaceuticals Container</b> : Pills, bottles, injectables, antibiotics, and sharps.
	Gaylord Box: May contain comingled items mentioned above.

BYPA Box: Overpack used for smaller pharmaceutical, trace chemo, and red sharps containers.
<b>Grey Macro/Blue Poly Bin</b> : Reusable bin that contains the same waste as the Rotonic container above.
Black Container: Black containers are typically part of the RCRA pharmaceutical program. Read labeling carefully.

#### Single Use Containers

Single use palletized materials that are processed by Covanta employees represent an overall lower risk to health, safety, and the environment for a few reasons. Palletized materials involve less manual handling compared to reusable macros and rotonics, which require the operator to remove lids, which may increase their risk of an exposure, such as a needle stick. Single use materials are also contained in a puncture-proof PG II container or Gaylord box. Some customer sites may even use an additional protective barrier in the form of a bulk over pack, such as when smaller and odd-shaped containers are placed into a larger corrugated cardboard box. Processing single use containers also involves less climbing and driving since containers are not loaded back onto the trailer.

#### **Reusable Containers**

Rotonic and macro-bin reusable containers present an increased health, safety, and environmental risk for a number of reasons. To better understand this process, it's important to note that materials are bulked or decanted into lined reusable containers at the customer consolidation and transfer facility. The contents of this waste can include sharps, residual pharmaceuticals, trace pathological waste, trace chemo waste, used PPE, tubing, and other debris generated in a healthcare setting. While the outer container is in itself puncture-proof the interior liner is not. Combining sharps, a liner susceptible to punctures, mixed with residual pharmaceutical liquids and small amounts of pathological waste can result in a slurry which together presents a larger risk than any single component of this waste stream. Careful handling of these containers is a must, as a careless act could result in a spill or a needle stick injury. Employees must always practice good hygiene principles by disinfecting equipment, including PPE, which might have come into contact with RMW.

#### Single-use Gaylords\*

Gaylord cubic yard boxes are accepted at the Covanta Tulsa location. These contain a mix of medical wastes, pharmaceutical, and trace chemotherapeutic wastes. By regulation, these are lined with internal bags, and absorbent is placed to control residual free liquids. These liquids may remain a seepage and spill risk- as settling of contents occur. The Gaylords require two steps of exposure risk to handle: attaching to the pallet and cutting of two vertical sides. These two steps allow the contents of the container to tip into the hopper bucket without loss of pallet into the bucket. Once emptied, the remaining box requires additional steps prior to incineration. Because of their size, the single use Gaylords require segregation based on soiling or presence of trace RMW. For more information on specific hazards associated with the processing steps of RMW, please see the RMW Hazard Analysis below in 4.4 and 4.5.

#### 4.4 Receiving, Handling, Storage, Destruction and Monitoring

#### 4.4.1 Receiving and Handling

Packages of RMW will remain sealed, secured and maintained in a non-putrescible state until treatment. The facility has constructed an RMW Automated Feed System (AFS) to transfer RMW from delivery trucks directly to the waste feed chutes of MWC Units 1, 2, and 3. This ensures Covanta operations of receiving, handling, and processing RMW are a controlled process. This controlled process has dedicated resources and trained personnel who process this waste.

#### 4.4.1.1 Automated Feed System (AFS) Operation Procedure

Boxes of RMW will be manually offloaded in the enclosed Profiled Waste Receiving Warehouse and then transferred into the Profiled Waste Processing Building. The RMW will then be placed onto the Automated Feed System (AFS) which will vertically lift the boxed waste to the charging floor elevation, where it will then be horizontally conveyed by an automated tipping bucket directly into the waste feed chute. Once in the feed chute, the boxes of RMW will mix with MSW, and feed by gravity onto the charging table that is integral to each MWC. From the charging table, the waste is hydraulically pushed into the combustion chamber.

#### 4.4.1.2 Reusable Containers

Customers may utilize reusable containers. Reusable containers must be carefully opened to prevent exposure and injury from the contents of the waste. Liners may have sharps protruding out of the tops upon removing the lids, emphasizing the need for close attention with an increased awareness of safety in mind. Puncture resistant personal protective equipment (PPE) must be worn when handling these containers. Containers are offloaded, staged, and then emptied into bins for delivery to the MWCs via the AFS.

#### 4.4.1.3 Single-use Containers

Gaylords\* and BYPA boxes may require securing bands to be cut or a removal of a side wall of the box to allow contents to tip. Often, shrink wrap on palletized containers may need to be cut and removed to allow loading and tipping from the hopper.

\*Gaylords are accepted at the Tulsa Facility. After they have been emptied, the remaining box requires additional steps prior to processing. Because of their size, they require segregation based on soiling or presence of trace RMW. The soiled Gaylords must be reduced in size to fall into the boiler hopper.

Other single use containers will have shrink-wrap securing the load to the pallet. The security of these loads should always be checked before proceeding to offload in order to prevent shifting and spilled loads. Shrink-wrap needs to be carefully cut to allow contents to fall into the waste feed chute.

#### 4.4.2 Storage

If the facility has not processed pathological waste or contaminated carcasses or body parts of animals intentionally exposed to pathogens in research, in the production of biologicals or the "in vivo" testing of pharmaceuticals within 24 hours of delivery to the Facility, the RMW will be maintained in refrigerated storage of 45°F until processing. Such wastes will only be unloaded from the trailer when the wastes can be processed within 24 hours and in conformance with the overall time limitation of 96 hours from delivery receipt.

Any RMW shipment that is not processed within 96 hours of receipt will be sent to a facility permitted to process RMW.

See WEP Section 7.0 – Rejected Waste Procedure for additional storage information of rejected waste loads.

#### 4.4.3 Destruction

The MWC units at Covanta Tulsa utilize water wall furnaces. Each of the three units is equipped with state-of-the-art combustion technology. The major components of the MWC combustion system as described in detail below.

The process begins when waste is charged to the feed chute. The fuel, i.e., MSW, is loaded into the feed chute from the storage bunker via an orange peel grapple. Boxed regulated medical waste will be introduced to the feed chute by way of the automated hopper feed system described above. The feed chute not only serves as a mechanism for introducing waste into the combustion chamber, but also serves the purpose of providing an airlock to prevent unwanted ambient air into the combustion chamber. From the feed chute, waste is metered into the combustion chamber by hydraulic ram feeders. The feeder system is automatically controlled by a combustion algorithm that monitors critical combustion parameters such as oxygen levels, temperatures, and steam production rate within the boiler. The feeder periodically meters waste onto the combustion grate. The combustion grate simultaneously agitates the waste for complete combustion while allowing combustion air (also referred to as under fire air), to flow up through the waste. Combustion air is also introduced above the grate in the form of overfire air. The combination of the under-fire air and the overfire air is supplied at a rate sufficient to achieve complete combustion of the waste. The residence time of the waste on the combustion grate varies depending on multiple factors but is about 45 minutes. Once the waste is completely combusted it is reduced to combustion ash, which drops via gravity off the end of the grate into the ash discharger. Like the waste feed chute, the ash discharger serves the dual purpose of evacuating combustion residue (ash) from the furnace while providing an airlock to prevent introduction of unwanted ambient air.

Combustion of the waste within the furnace is accomplished in a single chamber. Initially, heat is applied to the waste through the auxiliary burner. Once combustion of the waste is initiated, liberated heat from the previously fed waste will ignite newly charged waste. As discussed above, the combustion rate is tightly controlled by the amount of air being supplied through the under fire and overfire air systems. The temperature within the combustion zone just above the grate system is designed to be more than 2,000 °F. This temperature will ensure that the organic and pathological components are destroyed.

#### 4.4.3.1 Initiation of RMW Processing

After following the MWC unit startup procedures included in Section 4 of the Environmental Compliance Operations Manual (ECOM), the following conditions must be met prior to initiation of RMW processing:

- 1. Unit must be online minimum of 4 hours and have stable\_operations.
- 2. All underfire air preheater coils are in-service.

#### 4.4.3.2 Controlled Shutdown

- 1. After processing of RMW is complete, continue to operate the combustion units 3-hours prior to initiating a normal shutdown.
- 2. Follow normal shutdown procedures in the ECOM.

#### 4.4.3.3 Emergency Shutdown (Potential of Unprocessed RMW/MSW on Grate Surface).

- 1. Follow ECOM.
- 2. Keep all preheater coils in service.
- 3. Install bypass plate at grizzly scalper. Refer to JSA #48.
- 4. Keep grates and dischargers in non-interlock, run to expel all unburned material from grates and ash discharger.
- 5. Designate area in pit for unprocessed waste from grizzly bunker to be transported for immediate reprocessing in the online unit.
- 6. All equipment that came into contact with unprocessed fuel will be disinfected.

#### 4.4.4 Monitoring

Air pollutant emissions of  $SO_2$ ,  $NO_x$  and CO from each unit are monitored by CEMS and Opacity by COMS, while stack testing is performed for: PM, HF, VOC, Sulfuric Acid, Be, Cd, Hg, Pb, HCl and D/F.

The Facility will follow its excess emissions reporting procedure and operator procedures in the event of an upset condition or excess emission event.

Air pollutant emissions are well controlled at Covanta Tulsa. Air Pollutant Control (APC) equipment and practices on each unit include: SNCR system for the control of NO<sub>x</sub> emissions; GCP to minimize NO<sub>x</sub>, CO and VOC emissions; SDA system for the control of acid gas emissions (i.e., SO<sub>2</sub>, HCl, hydrogen fluorides (HF), and sulfuric acid mist); ACl system for the control of Hg, D/F and other hazardous air pollutant emissions; and a baghouse filter system for the control of PM (including metals) and Hg emissions.

#### 4.4.5 **Risk and Awareness**

RMW handling presents many risks – sharps, free flowing liquids, bio-aerosols, use of powered industrial trucks. Primary exposure risks include puncture and cuts from sharps, liquids, and aerosolization of bloodborne pathogens. The primary risk mitigation is engineering controls, including the RMW Automated Feeding System. Appropriate PPE is also required -- all personnel involved in handling RMW must carefully consult the PPE Matrix.

A sample diagram below shows how droplets or mists containing infectious material has been shown to transmit, leading Covanta employees to exercise extra precaution and don appropriate PPE during processing of RMW.



#### **Illustration of Aerosolization & Droplets**

#### 4.4.6 **Contingency Planning**

Covanta Tulsa has robust operating procedures and training programs to address many of the potential disruptions that can occur when processing regulated medical waste. This section details some of the more-common disruptions.

Infectious body fluids

faeces, urine, bile, blood

Sputum, respiratory secretions

Sputum, respiratory secretions,

Sputum, respiratory secretions,

Sputum, respiratory secretions,

Respiratory secretions, secretion

Sputum, respiratory secretions,

Sputum, respiratory secretions

Blood, sputum, respiratory

secretions, ichors, urine

Nasal secretions, ichors

Sputum, urine, faeces

Blood

Blood

Faeces

Faeces

Blood

ichors

ichors

ichors

of pustules

faeces

Faeces, vomit

#### 4.4.6.1 Over-Packing

Over-packing the RMW containers is minimized through a robust customer onboarding process and managed through the visual inspection completed upon arrival. Loads which include containers that are overpacked will be evaluated for rejection.

#### 4.4.6.2 Decontaminating Vehicles and Containers

Vehicles or containers which require decontamination utilize the disinfectants and required PPE as identified in Appendix C. Wash water and used PPE are collected and routed to the MWC units via the LDI system and AFS, respectively. Personnel involved in decontamination activities receive both HAZWOPER and specialized training.

#### 4.4.6.3 Safely Storing Improper Wastes and Poorly-Packaged Wastes

In general, Covanta Tulsa does not store improper or poorly-packaged wastes. Instead, the loads are rejected at the delivery inspection and returned to the customer.

# 4.4.6.4 Procedures for Re-Packaging Defective, Problematic or Leaking Waste Containers Detected during Visual Inspection

Covanta Tulsa does not repackage waste containers which are found to be defective, problematic, or leaking. In the event a leaking container is identified subsequent to a successful receiving inspection, the Facility will utilize absorbent materials to collect the spill. Once the spill is collected and the problematic container remedied (or routed to the AFS bins for disposal), the collected material and PPE worn by facility personnel will be collected and processed as RMW material. The Facility personnel will also disinfect any impacted bins or surfaces.

# 4.4.6.5 Alternative Management of Wastes in the Event of Equipment Malfunction, Emergencies or Other Unforeseen Situations

In the event the malfunction or emergency cannot be remedied within an acceptable period of time, RMW material will be routed to a facility permitted to process RMW in the event of equipment malfunctions, emergencies, or other unforeseen situations. All RMW material must be processed within 96 hours or delivery.

## 4.5 Hazards and Risk Mitigation

#### 4.5.1 Biological

The contents of RMW includes an array of potential biological hazards from bacteria to viruses. For example, blood or other bodily fluids are more likely to contain an infectious amount of any given biohazard than something like packaging or unused sharps. Never assume a waste is non-infectious based on the looks alone. All waste must be considered as being contaminated. You never know what could have come in contact with that waste upstream. The Universal Precaution is a key principle to the Blood-borne Pathogens program and should be strongly emphasized and enforced when working near RMW. Always assume that the RMW waste is infectious.

The most common pathogens to be expected in RMW includes Hepatitis B, Hepatitis C, Human Immunodeficiency Virus (HIV), Tuberculosis, and pathogenic staphylococcus aureus (commonly known as 'Staph'). *See Chart Below*. Covanta offers employees who have the potential to come into contact with Hepatitis B a vaccine at no cost to the employee. It is strongly encouraged that you receive this vaccine to minimize the risk of acquiring this disease if exposed to the virus.

#### 4.5.2 Chemical



Covanta does not accept any hazardous waste identified in 40 CFR 261. However, there is the possibility of receiving a shipment not properly segregated as hazardous waste. The most common type of hazardous waste to be received through the RMW program are hazardous (RCRA) pharmaceuticals and large quantities of chemotherapy waste. These are drugs that can be extremely toxic and can cause adverse health effects in otherwise healthy people.

Other chemical hazards include disinfectants used in the RMW area to render equipment, PPE, and surfaces as non-infectious. Common disinfectants include household bleach, Virkon, and Wex-cide 128. Always remember to read the Safety Data Sheet (SDS) for hazards and to use as directed.

Chemical hazards are mitigated using engineering controls as described previously in section 4.6.2 of this document, appropriate PPE as selected from the PPE Matrix, and good housekeeping operations.

#### 4.5.3 Physical

Some physical hazards associated with processing RMW include exposure to hot or cold environments, especially during winter and summer months, and excessive airborne particulates or dust, especially during dry conditions. Other notable hazards include elevated noise levels on the tipping floor, due to the size of the area, heavy equipment operation, and lack of noise cancelling materials.

Physical hazards are mitigated using engineering controls as described in section 4.6.2 of this document, appropriate PPE as selected from the PPE matrix, and employee training related to identifying and responding to various hazards.

#### 4.6 Controls and Exposure Control Plan 1910.1030(c)

#### 4.6.1 RMW Spill Clean up (See Appendix C – Approved PPE and Supplies)

Housekeeping:

- Clean up spills immediately if they occur and disinfect with Virkon, Wexcide, or bleach solution (remember to read the label and follow the manufacturers recommendations).
- Use hand tools to prevent contact.
- Spray disinfectant solution on forklift forks & mast area.
- Spray disinfectant on ground where any RMW spill has occurred.
- Wipe forklift controls and radio down with disinfectant wipes.

Hygiene:

- When leaving RMW waste handling area, wash hands with soap and warm water or use hand sanitizer when soap and water are not readily available.
- As needed and at end of shift, decontaminate tools.
- Avoid contact with gloves and face.
- Replace gloves and Tyvek coveralls as needed.
- Do not eat, smoke or use phone when donned with PPE that has been in contact with RMW waste.

#### 4.6.2 Engineering Controls

Engineering controls are one of the most effective mechanisms for eliminating the exposure to a hazard. Whereas PPE protects the worker from exposure, engineering controls are designed to isolate or eliminate the hazard. Engineering controls can include barriers, guards, ventilation, among others. Covanta recognizes the importance of engineering controls as the preferred method of control.

Barriers prevent workers outside of the immediate hazard area from exposure. Guards, especially on moving or hazardously charged equipment, isolate the hazard. Processing of RMW has the risk of aerosolization of bloodborne pathogens within tiny droplets or mist. This presents an inhalation hazard. To control aerosolization, the Facility has developed engineering controls such as high-speed roll up doors and louvered windows, to create negative air pressure that reduces the likelihood of an aerosolized pathogen from residing in a working area. Splash guards are another engineering control that prevents liquid waste from coming into contact with a worker.

#### 4.6.3 Administrative Controls

Administrative controls come in several forms and include training, job rotation, and signage as the major ones. In order to stay competent and up-to-date, training is provided at regular recurring intervals. Training helps reinforce principles, best practices, and changes to requirements, regulations, and/or processes.

Job rotation is an effective control to minimize fatigue, ergonomic issues, and to reduce the overall accumulative exposure to a hazard.

There are inherent risks associated with operating heavy equipment and processing RMW. Some jobs may require more close contact with RMW, such as emptying containers of waste on the tipping floor. Other jobs affecting the processing of RMW can be done through additional controls (barriers, central air, etc.), such as driving trailers or operating the crane for the blue bin tipper.

Signage is an important component to the hazard communication program to ensure anyone working within or nearby an RMW processing area is aware of the hazard present. Universal biohazard signs shall mark areas where active RMW processing is taking place and that additional training and/or PPE is required for access.

#### 4.6.4 Personal Protective Equipment

One of the most common, but not always effective controls, is personal protective equipment (PPE). PPE can protect workers from injury when worn correctly, inspected regularly, stored appropriately, and replaced when needed. Prior to using any PPE, an initial inspection should be done to identify tears, cracks, misuse, size requirements, and overall suitability to protect against the hazards they're designed for. Damaged or compromised PPE should never be used. If you notice an issue with your PPE or a coworker's PPE, do not use, tag out of service, and communicate the need for replacement with your supervisor.

To have effective PPE, remember what you're protecting against. For example, you wouldn't use an air purifying respirator (APR) in an oxygen deficient atmosphere. If you're cleaning up biological spill as another example, choose fluid resistant PPE such as nitrile gloves and Tyvek suits over regular work clothes and leather gloves.

#### 4.6.5 Hazard Analysis

Processing RMW has many known hazards, of which, can be grouped into chemical, biological, and physical hazards. Hazards exist from the moment a trailer containing RMW is opened all the way to the end of the process where an empty trailer is taken off site. The discussion to follow will outline some of the most prominent hazards of this process and their relative risk with consideration of severity and likelihood of an accident.

#### 4.6.6 Exposure Determination

See appendix A for list of employees with occupational exposure risk evaluation, and job classifications of those employees, or groups, with closely related tasks and procedures. (Exposure determination is made without regard to PPE).

#### 4.6.7 Hepatitis B Vaccine

All employees are offered the Hepatitis B vaccination at no cost to the employee. If employee refuses the vaccination, they must sign a refusal form which is kept with employee health records. Copies of these records can be obtained for inspection through the designated representative.

#### 4.6.8 Post Exposure Evaluation

Following a report of an exposure incident, the employer shall make immediately available to the exposed employee a confidential medical evaluation and follow-up to include the requirements of 1910.1030(f).

#### 4.7 Training

#### 4.7.1 Requirements

Training is an essential component to the RMW program and mitigating the risk of exposure to any of the major hazards associated with the processing of RMW.

Initial Operator training shall be conducted for any employee who will be directly working with RMW prior to performing the functions of this job. Training shall be provided by a competent person such as the Training Specialist, QA/QC Specialist working for the RMW program, the Profiled Waste Coordinator who oversees the RMW program, the site Environmental Specialist, or by the sites' Health and Safety Coordinator.

Recurrent training shall be provided on an annual basis.

Additional Health and Safety training requirements for topics such as Bloodborne Pathogens, Mobile Equipment, Spill Containment, Hazard Communication, Medical Surveillance, etc. are managed and coordinated by the Health and Safety Coordinator.

#### 4.8 Recordkeeping

1. The facility shall maintain monthly records of RMW processed in addition to records required in accordance with the Title V and Land Division Protection permits. REFERENCES

Title V Permit #2014-1722-TVR (M-1)

Solid Waste Permit #3572033

Waste Exclusion Plan (WEP)

RMW Opportunity Management (Audit)

Emergency Action Plan

Relevant Covanta Safety Procedures (S.P.) are listed below. The S.P.'s are available for review by agency personnel upon request.

S.P. No. 01 – Safety and Health Policy

S.P. No. 03 – Hazard Communication WHMIS

S.P. No. 03B – HAZCOM and HAZCOM Training for Facility Personnel Involved with Supplemental Waste

- S.P. No. 07 Medical Surveillance Program
- S.P. No. 10 Eye Protection
- S.P. No. 11 Respiratory Protection
- S.P. No. 25 Mobile Equipment Safety
- S.P. No. 32 Tipping Floor Procedure
- S.P. No. 32A Identifying and Handling Hazardous Substances in the Waste Stream
- S.P. No. 38 Employee Exposure Monitoring
- S.P. No. 40 Bloodborne Pathogens
- S.P. No. 43 Personal Protective Equipment Assessment
- S.P. No. 48 Disposal of Potentially Contaminated Debris

Medical Emergency "Pull File"

## **Revision History**

Briefly explain what changes were made in the current version as compared to the previous version.

Revision Date	Revision No.	Description of Change(s)
01/18/2023	2	Initial Document for Covanta Tulsa RMW Processing
01/25/2023	3	For submittal with RMW permit modification
10/05/23	4	Updated language and formatting

#### Appendix A. Covanta Acceptable and Unacceptable Regulated Medical Wastes (RMW)

There are many sources of medical wastes including hospitals, dental offices, veterinary clinics, and research institutions, among others. Non-hazardous RMW waste streams that will be accepted at the Tulsa Facility as part of Covanta's Regulated Medical Waste Program are listed below:

#### Acceptable Regulated Medical Waste

#### OKDEQ 252:515-1-2

"Regulated medical waste" means a waste or reusable material that contains an etiologic agent and is generated in the diagnosis, treatment or immunization of human beings or animals; research pertaining to the diagnosis, treatment or immunization of human beings or animals; or the production or testing of biological products. Such waste includes, but is not limited to:

- a. Cultures and stocks of etiologic agents or live vaccines, and culture dishes, devices, paper, and cloth that has come into contact with such cultures, stocks or live vaccines;
- b. Human blood, blood products, and human body fluids, except urine or feces;
- c. Pathological wastes consisting of human tissues, organs, and body parts removed during surgery, autopsy, biopsy and other medical procedures;
- d. Untreated sharps;
- e. Used blood collection bags, tubes, and vials;
- f. Contaminated carcasses, body parts and bedding of animals intentionally exposed to pathogens in research, in the production of biologicals or the "in vivo" testing of pharmaceuticals;
- g. Items contaminated with blood or other human body fluids which drip freely or would release such materials in a liquid or semi-liquid state if compressed or are caked with dried blood or body fluids and are capable of releasing these materials;
- h. Isolation wastes unless determined to be non-infectious by the infection control committee at the health care facility;
- i. HIV-containing cell or tissue cultures, organ cultures, and HIV- or HBV-containing culture medium or other solutions; and blood, organs, or other tissues from experimental animals infected with HIV or HBV;
- j. All disposable materials that have come in contact with cytotoxic or antineoplastic agents during the preparation, handling, and administration of such agents. Such wastes include, but are not limited to, masks, gloves, gowns, empty IV tubing and bags, vials, and other contaminated materials; and
- k. Any other material or equipment which, in the determination of the health care facility staff, infection control committee or other responsible party, presents a significant danger of infection because it is contaminated with, or may reasonably be expected to be contaminated with, etiologic agents.

Acceptable RMW additionally includes the following:

- I. Trace chemotherapeutic waste<sup>2</sup>
- m. Unused sharps, including the following unused discarded sharps: hypodermic needles, suture needles, syringes, and scalpel blades <sup>3</sup>

Notwithstanding the paragraph above, Covanta Tulsa will <u>not</u> accept the following RMW waste streams for processing at the Tulsa Facility:

#### Unacceptable Regulated Medical Waste, not limited to:

- a. Human fetal tissue,
- b. Any type of RMW generated by or originating from an outpatient medical facility or clinic that provides abortion services,
- c. Large Pathological Waste (for example, torsos, heads, or large animal carcasses), and/or

<sup>&</sup>lt;sup>2</sup> See Biomedical Waste, OAC 252:100-17-9

<sup>&</sup>lt;sup>3</sup> See 40 CFR 60.51c "Medical/Infectious Waste"

#### **Appendix B. EXPOSURE AND JOB CLASSIFICATION**

Exposure level:

- 1: Highest
- 2: Medium
- 3: Lowest/none
- 1ASSISTANT SHIFT ENGINEER1AUXILIARY OPERATOR
- 1 EQUIPMENT OPERATOR
- 1 UTILITY OPERATOR
- 1 QA/QC MANAGER
- 2 SAFETY COORDINATOR
- 2 MECHANIC/WELDER
- 2 MECHANIC/WELDER
- 2 ELECTRICIAN
- 2 SHIFT SUPERVISOR
- 3 SHIFT ENGINEER
- 3 FACILITY BUSINESS MANAGER
- 3 OPERATIONS & MAINTENANCE MANAGER
- 3 STOREKEEPER
- 3 ADMINISTRATIVE ASSISTANT
- 3 SCALEHOUSE ATTENDANT
- 3 ENVIRONMENTAL SPECIALIST

#### Appendix C: Approved PPE and Supplies

The purpose of this Appendix is to provide options for Protective Equipment (PPE) and disinfecting supplies for the safe receiving and processing of NPAI Waste. The PPE and supplies shall be used in conformance to site specific job safety assessments (JSAs), Covanta safety procedures, and the Covanta Regulated Medical Processing SOP.

Description:	Preferred Product/Arbill # Alternative #1/Arbill # Alternative #2/Arbill #
Protective Coveralls:	Truline Triguard Elastic Wrist-Ankle/A203734 Posi-Wear or Posi-Wear/FR C3806 or 3106
	TYVEK- W/O FEET/A204204
Nitrile Gloves:	Percept Nitrile/A151384
	Percept Ex Nitrile/A151944
	Ansell Touch-N-Tuff Grainger/4GC50
Face Shield:	V-Gard Metal Frame Face shield/10158800
	Face shield Bracket Nylon Blue/101-FACESHIELD
	Metal Full Brim HH Face shield Adaptor/14393 + 181640
Protective Masks:	Moldex/2300N95/A501250
	3M N95 8511/A502015
	3M N95 8210/A501818
	Moldex 2700N95/A501280
	Truline Breathe Free N95 w/ value/A501760
	3M N95 8214/A501965
	3M N95 8511/A502015
	3M - N100 w/ Valve Fastenal -/1001934
Rubber Boots:	Nuke Boot 12 in overboot sz 12-13/A202104
	Nuke Boot 12 in overboot sz 10-11/A202103
	Nuke Boot 12 in overboot sz 8-9/A202102
Disinfecting Solution:	Purell with Aloe/N/A
	HDX Hand Sanitizer Gel/N/A
	Purell Advanced Hand Sanitizer/N/A

Duct Tape:

3M/N/A Gorilla/N/A Nashua/N/A