# ATTACHMENT 14

# FUME MANAGEMENT

Attachment 14
Fume Management

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## 1.0 Introduction

This attachment addresses the management of fumes as mandated by RCRA and the Division of Waste Management and Radiation Control (DWMRC). There are two separate and distinct fume systems associated with the incinerator: the closed vent system (i.e., the combustion air system and the backup carbon adsorption system) and the hydrocarbon vent system. Each will be addressed below with their components outlined. Analyzers and interlocks described below are detailed on drawings D-800-PI-316, D-800-PI-317, D-800-PI-410, and D-800-PI-411 in Attachment 10. There are also other vent systems for other storage and processing operations at the facility. These are discussed in section 4.

## 2.0 Closed Vent System

The closed vent system (i.e., the combustion air system and the backup carbon system) collects ventilation air from sources that handle waste in the aggregate with greater than 140 °F flash point (or, in the case of the direct burn tanker vacuum decant operations, the vent gas is diluted to below 60% LEL prior to entering the closed vent system). These sources include the bulk solids building, the shredder, the apron feeder, the small sludge tank, the drive through direct burn tanker vacuum pump, and the sludge pad direct burn tanker/tote vent. The destination of these fumes is to the combustion air fans under normal operating conditions. When the combustion air fans are off, or whenever the ABC temperature is lower than 1400 °F for more than ten minutes, the fumes report to the backup carbon adsorption system (described in section 2.7).

The air ventilated from these sources is always exhausted either through the combustion air system to the incinerator or to the backup carbon system. During normal operations, the bulk solids building, the shredder, the apron feeder, the small sludge tank, the diluted vent gas from the drive through direct burn tanker vacuum decant operations (when operating), and the sludge pad direct burn tanker/tote vent (when operating) will be vented to the kiln and ABC and the backup carbon adsorption system will be isolated. During backup operations (when the combustion air fans are off or when the ABC is operating at a temperature less than 1400 °F for more than ten minutes) the bulk solids building, shredder and small sludge tank will be vented to the carbon adsorption system, and the kiln and ABC will be isolated from these sources and will draw combustion air from the 48 inch plenum through the atmospheric vents. The vent from the apron feeder will be closed (i.e., damper HV4050 will be closed) and any venting of this device will be through the bulk solids building to the carbon adsorption system. The drive through direct burn tanker vacuum decant operations and the sludge pad direct burn tanker/tote operations will not occur during backup operations.

Inspection ports are located in the kiln and ABC combustion air ducts. These will be checked for dusting and liquid accumulation at least once per week. In-line LEL instruments monitor the ducts (north and south side of kiln combustion air duct, and north and south ABC combustion air ducts) to determine hydrocarbon levels. The LEL instruments are tied to the control computer (WDPF). The process flow is shown in drawing D-034-PF-603 in Attachment 10. The combustion air system and the backup carbon system are shown in drawings D-800-PI-410, and

D-800-PI-411 in Attachment 10. The liquid trap for the vacuum decant system in the drive through direct burn station is equipped with a high-level sensor, which will alarm locally and in the control room when the liquid level reaches one foot. The operator will then stop the vacuum decant system and drain the liquid from the trap.

The closed vent system between the bulk solids building, the shredder, the apron feeder, the small sludge tank and the inlet to the ID fans (both kiln/ABC combustion air fans and the carbon adsorption system ID fan) will be operated at below atmospheric pressure. It will have at least one magnehelic pressure gauge installed in the vent system to verify a draft condition in the combustion air ductwork. There will be a flow switch in the combustion air ductwork that will generate a digital signal that will be recorded in Wonderware that can also be used to verify that the closed vent system is operated at a pressure less than atmospheric. The duct work sections between the carbon adsorption system ID fan (K-401) and the carbon adsorbers, between the combustion air fans (K-101 and K-102A/B) and the incinerator, between the vacuum pump dilution air fan (K-407) and the combustion air plenum, and between the sludge pad direct burn system and the closed vent system will be operated at a positive pressure. These sections of the vent system will be monitored annually to ensure that there are no VOC emissions greater than 500 ppm above background.

## 2.1 Bulk Solids Building

Dirt and debris are typical waste in bulk solids. Air is drawn from the bulk solids building by the combustion air fans during normal plant operations. The vent system consists of ducting from bulk solids to the air plenum that reports to combustion air fans. The system is activated whenever the combustion air fans are on and the temperature in the ABC is greater than 1400 °F. In-line LEL instruments monitor the duct to determine hydrocarbon levels. The LEL instruments are tied into the kiln's control computer, the WDPF. Inspection ports in the ducting must also be checked for dusting and liquid accumulation at least once per week.

When the combustion air fans are off, or whenever the ABC temperature is lower than 1400 °F for more than ten minutes, the fumes report to the backup carbon adsorption system.

The bulk solids building, and associated vents will serve as the enclosure that is vented through a closed vent system to an enclosed combustion control device (or to the backup carbon adsorption system) in order for the bulk solids tanks to comply with Tank Level 2 controls specified in R315-264-1084(d)(5). The bulk solids building shall be operated in accordance with the criteria for a permanent total enclosure as specified in "Procedure T -- Criteria for and Verification of a Permanent or Temporary Total Enclosure" under 40 CFR§52.741, Appendix B. Testing to demonstrate that the bulk solids building meets these criteria will be done initially, and annually thereafter.

Tables 1 and 2 list the natural draft openings (NDOs) that are allowed in the bulk solids building during normal and backup operations, respectively. Clean Harbors Aragonite (Aragonite) will maintain the surface area of each of the NDOs at or below the specifications given in Table 1 (during normal operations) or Table 2 (during backup operations). However, in order to allow for time to seal openings for backup operations, the NDOs listed in Table 1 may be in place for periods of up to four hours while venting to the backup carbon adsorption system.

The doors to the bulk solids building must remain closed except when unloading waste into the tanks, managing waste with external equipment, emergencies, and maintenance activities. Doors must be closed as soon as possible (at least within 15 minutes) after unloading a truck or performing other activities for which the doors must be opened.

During normal operations, a minimum flow of 5300 acfm will be vented from the bulk solids enclosure at all times to maintain the required minimum flow velocity through the NDOs. Since this air combines with vent gas from the direct burn tanker vacuum pump and dilution air prior to being measured, the following will be implemented. The dilution air fan, damper, or both will be configured to produce a maximum total flow of 5225 acfm to the combustion air plenum. This will be documented by manual measurements prior to operation, and the same configuration will be maintained during operation. To ensure a minimum flow from the bulk solids enclosure, the flow of combustion air will be maintained above 12,000 acfm when the vacuum pump/dilution air fan are operating and above 6775 acfm when they are not operating. This flow will be determined based on the combined flow measured by flow meters FIT1143, FIT1192, FIT1247, and FIT1015. Should there be a malfunction with one or more of these flow meters, four hours will be allowed for repair. These flows will be monitored and recorded at all times the fumes are being directed to the incinerator. The atmospheric air vents (HV4018 and HV4025) will be closed during normal operations. However, during emergency situations, HV4018 will modulate, if necessary, to maintain the LEL of the highest of sensors AIT4018A, B, C, or D below 25%. Any time HV4018 is not closed during normal operations will be recorded in the Wonderware archiving system. The required minimum flow during backup operation will be determined by annually measuring the volumetric flow, corrected to standard conditions, by EPA Method 2 as required by "Procedure T -- Criteria for and Verification of a Permanent or Temporary Total Enclosure" under 40 CFR§52.741, Appendix B. An anemometer may be used in place of the pitot tube for determining the flow in the ducts. The carbon adsorption ID fan and dampers will have the same configuration during operation as during the most recent test. The minimum required flow, along with the documentation supporting this value, will be submitted to the Director of the Division of Waste Management and Radiation Control (Director) within fourteen days of completing the test.

## 2.2 Bulk Solids Shredder

There is a shredder located in the bulk solids building. In-line LEL instruments monitor the duct to determine hydrocarbon levels. The LEL instruments are tied into the WDPF. Inspection ports in the ducting must also be checked for dusting and liquid accumulation at least once per week.

The shredder is vented to the incinerator through the combustion air system during normal operations. During backup operations (when the combustion air fans are off or when the ABC is operating at a temperature less than 1400°F for more than ten minutes) the shredder will be vented to the carbon adsorption system. Damper HV4017 will be maintained between 5 and 25% open.

### 2.3 Apron Feeder

The apron feeder conveys material from bulk solids to the kiln. Air is drawn from the apron feeder to the combustion air system during normal operations.

The apron feeder, which is connected to the bulk solids building, does not function as part of the enclosure for the bulk solids tanks. Rather, the apron feeder chute and dribble chute openings function as NDOs for the bulk solids building. When the backup carbon adsorption system is in operation, the apron feeder chute and dribble chute will be sealed as indicated in Table 2. To minimize air emissions, Aragonite will seal the apron feeder openings as much as is feasible.

The material from the apron feeder drops through a double set of flop gates before entering the kiln. To isolate the kiln from the apron feeder, only one set of flop gates is open at once. To further isolate the kiln from the apron feeder, a slide gate is located below the bottom flop gates. The slide gate only opens to allow the bottom flop gates to drop the material into the kiln. The chamber between the flop gates is equipped with a nitrogen purge system. This system is used when feeding material that has a potential of catching fire before entering the kiln. When the material is between the flop gates, the chamber is purged with nitrogen so that the heat from the kiln will not ignite the material.

### 2.4 Small Sludge Tank

The small sludge tank (T-406) is a 5549-gallon tank used for receiving sludge waste from tankers and from other containers. The sludge material must have a flash point greater than 140°F and must not be reactive. This tank has a large, hinged door that covers a grizzly type grating for straining the sludge, and a smaller door for adding material from containers. Material from the large sludge tank (T-401) can be added to the tank via hard piping or a hose. This tank (T-406) is vented to the incinerator through the combustion air system during normal operations. During backup operations (i.e., when the combustion air fans are off or the ABC temperature drops below 1400 °F for more than ten minutes), the ventilation duct damper (HV4023) will remain open, and the tank will be vented to the backup carbon adsorption system.

In-line LEL instruments monitor the hydrocarbon levels in the duct. The LEL instruments are tied to the WDPF. Inspection ports in the ducting must also be checked for dusting and liquid accumulation at least once per week.

The tank will comply with the Tank Level 2 controls specified in R315-264-1084(d)(3). Except when adding waste through the doors to the tank, all doors will be closed. They will be maintained so that there are no visible cracks, holes, gaps, or other open spaces. The doors must be closed as soon as possible (at least within 15 minutes) after unloading a truck or container into the tank. When it is necessary to add waste to the tank through the large tank lid, it should be maintained as closed as possible during the operation.

## 2.5 Drive Through Direct Burn Tanker Decant Pumps

Decanting of containers may occur in the drive through direct burn station. Liquids are transferred from a container to a tanker (roberoller) by using a double diaphragm pump or the vacuum pump on the tanker. When the double diaphragm pump is used, the gas displaced from the roberoller will be directed to a carbon adsorption system described in Sections 4.1 and 4.1.3. When the vacuum pump is used, the vacuum exhaust will be mixed with dilution air and directed to the closed vent system. When the backup carbon adsorption system is being used, no vacuum pump decanting from a container to a tanker occurs.

## 2.6 Sludge Pad Direct Burn Tanker/Tote

After a direct burn tanker/tote is moved to the sludge pad direct burn station and set up to be fed to the incinerator, nitrogen is connected to the tanker/tote to maintain a nitrogen blanket in the tanker/tote as its contents are being fed to the incinerator. Following off-loading of the direct burn tanker, any compressed nitrogen in the tanker/tote will be relieved through the closed vent system.

## 2.7 Backup Carbon Adsorption System

The carbon adsorption system includes an ID fan (K-401) that maintains the required draft to provide the necessary face velocity across the NDOs in the bulk solids building to capture VOCs and transport them to the carbon adsorbers. An in-line particulate filter prevents dust from clogging the carbon adsorber beds. The carbon adsorption system will vent fumes from the bulk solids building, the shredder, and the small sludge tank when it is in operation. The vent from the apron feeder will be closed and any venting of the apron feeder will be through the bulk solids building.

The carbon adsorption system will be in use during planned maintenance activities and during emergency or unplanned maintenance activities where the ABC temperature is reduced to less than 1400 °F for more than ten minutes or when the combustion air fans are off.

The backup carbon adsorption system includes two single stage carbon adsorbers in a parallel arrangement that are operated one at a time. The unit that is in use is the primary backup unit. The unit that is not in use will serve as a secondary backup. The unit serving as the secondary backup will be placed on-line before the carbon in the primary backup unit becomes exhausted. The exhausted carbon will be replaced in the primary unit and that unit will then serve as the secondary backup.

Each carbon adsorber will be filled with 4000 pounds of activated carbon. Each has a bed depth of 2.8 feet and a volume of 133 cubic feet. The type of carbon to be used will meet or exceed the requirements of the following specifications:

For reactivated carbon -- Calgon vapor phase react carbon (VPR 4x6 - 4x10)
For virgin carbon -- Calgon vapor phase BPL 4x6 - 4x10 carbon

The carbon will be replaced on a regular predetermined time interval that is less than the design carbon replacement interval based on the flow rates and VOC concentrations in the closed vent system. Only the hours that the carbon is actually in use are counted for determining when the carbon will be replaced. The actual number of hours that each carbon adsorber is in use (as well as which time period it is in) will be recorded in Wonderware. If a carbon adsorber is used during both time periods (summer as well as other months) the time used will be prorated for each time period (e.g., if reactivated carbon with a summer replacement interval of 528 hours and a replacement interval of 888 hours for all other months were used for 264 hours during the summer and the rest of the time during the other months, the carbon would need to be changed after being used for 444 hours in the other months). June, July, and August are designated as summer months.

The spent carbon will be managed as a hazardous waste. Records of the dates the carbon is removed, placed into permitted storage, and treated will be maintained in the operating record.

The carbon adsorbers will be equipped with CO detectors for monitoring for hot spots in the carbon bed. The carbon adsorbers will be maintained in an inert nitrogen atmosphere while not in use. When idle, the carbon adsorbers will be isolated with dampers at the inlet and outlet (stack) to maintain the inert atmosphere and to minimize VOC emissions.

The carbon adsorption system ID fan and dampers will be configured to maintain the minimum required flow from the bulk solids enclosure as explained in section 2.1. Following each verification of the Procedure T enclosure using the backup carbon adsorption system, the appropriate carbon replacement intervals will be determined (based on the flow necessary to maintain the criteria for the permanent total enclosure and any changes in the VOC concentrations in the closed vent system). Any changes to the system that requires a higher flow rate than was previously determined will not be made until new carbon replacement intervals have been calculated and programmed into the system.

Aragonite will periodically measure the VOC concentrations in the closed vent system by sampling the exhaust at a location before the backup carbon units and analyzing the gas contents to verify that they remain similar to those used in the design analysis. These measurements shall be made at least annually and whenever requested by the Director. If the periodic readings indicate that the VOC levels are higher than those used in the previous calculation of the carbon replacement interval, the carbon replacement interval will be recalculated and programmed into the system. Similarly, if the periodic readings indicate that the VOC levels are lower than those used in the previous calculation of the carbon replacement interval, the carbon replacement interval may be recalculated and programmed into the system.

The carbon replacement intervals (for both reactivated and virgin carbon during both summer and non-summer months) along with any supporting documentation (e.g., flow rate measurements, VOC measurements, etc.) and calculations will be certified by a Utah licensed professional engineer and submitted to the Director within fourteen days of making any change to the carbon replacement interval.

## 3.0 Hydrocarbon Vent System

The hydrocarbon vent system collects fumes from nitrogen blanketed storage tanks and from processing units that may handle waste with a flash point less than 140 °F. Normal operation is to collect fumes via piping or ducting and direct those fumes to the afterburner chamber. A blower and nozzle rated for pre-mixed fuel-air service will be used to input the fumes directly into the afterburner ABC. In accordance with NFPA, a flame arrestor will separate the collection system from the ABC. The pre-mix blower and an air inlet valve will insure minimum flow velocity at all times to prevent flashback.

A second part of the hydrocarbon system is carbon canisters. These 55-gallon canisters are filled with carbon. There are primary and secondary carbon canister systems. The four primary canisters are sized to handle normal flow rates and the secondary canisters are sized to handle peak flow rates. Each system consists of a first-stage and second-stage contact of the vent air with carbon. The canisters can be used either in conjunction with the pre-mix blower or independent of the blower. The canisters are used on these occasions:

a) when there is excess flow rate, as determined by overpressure in the hydrocarbon vent system
b) when the pre-mix blower, K-104, is off
c) when the ABC temperature is less than 1400 °F
d) when ABC $O_2$ is less than 2% or
e) when any combination of these conditions exists

The process flow is shown in drawing D-034-PF-604.

Temperature is monitored in the carbon system. Piping is installed to allow manual flooding on the carbon canisters with nitrogen if the temperature approaches auto ignition.

When fumes are directed to the carbon canisters, the fumes are monitored with a PID or equivalent every three hours. The sample ports are shown on drawing D-800-PI-316 in Attachment 10. Readings are taken from both primary and secondary headers and recorded on a log sheet at preset three-hour intervals. A reading of 100 ppm or greater will indicate breakthrough. Aragonite will immediately replace (not to exceed 30 minutes) any carbon adsorption canisters in which breakthrough has occurred.

Condensation traps are also part of this system. The condensation traps are equipped with level sensors that alarm to the WDPF when approximately 1/3 full. The traps will also be manually checked for liquid accumulation at least once per week. The following sources are part of the hydrocarbon vent system.

## 3.1 Liquid Tank Farm

The twelve storage tanks and the four blend tanks report to the hydrocarbon vent system. All tanks are under a nitrogen blanket.

## 3.2 Decant Operations

The decant process is located in the decant building inside of E-4, container processing. Containers of liquids are decanted via the use of either a vacuum pump or a diaphragm pump to pull liquids from the container and transfer that liquid directly to the tank farm. Air and vapors displaced by the vacuum pump or from the tank are directed to the hydrocarbon vent system.

## 3.3 Drive Through Direct Burn Tanker

After a direct burn tanker is moved to the drive through direct burn station and set up to be fed to the incinerator, nitrogen is connected to the tanker to maintain a nitrogen blanket in the tanker as its contents are being fed to the incinerator. Following off-loading of the direct burn tanker, any compressed nitrogen in the tanker will be relieved through the hydrocarbon vent system.

## 3.4 Truck Unloading Direct Burn Tanker

After a direct burn tanker is moved to the truck unloading direct burn station and set up to be fed to the incinerator, nitrogen is connected to the tanker to maintain a nitrogen blanket in the tanker as its contents are being fed to the incinerator. Following off-loading of the direct burn tanker, any compressed nitrogen in the tanker will be relieved through the hydrocarbon vent system.

## 3.5 Corrosive Feed Direct Burn Tanker/Tote

The corrosive waste feed system can be off-loaded by pressurizing the tanker/tote with nitrogen, by pumping, or both. Following the off-loading of the corrosive waste tanker/tote, any compressed nitrogen in the tanker/tote will be relieved through the hydrocarbon vent system.

## 3.6 Tanker to Tanker Transfer

Nitrogen and vapors displaced from filling a tanker during a tanker to tanker transfer are also directed to the hydrocarbon vent system.

## 3.7 Large Sludge Tank

The large sludge tank (T-401) is tied into the hydrocarbon vent system. This tank is nitrogen blanketed.

## 4.0 Other Vent Systems

There are other vent systems at Aragonite where waste is stored, sampled, or both, but are not part of either the combustion air or the hydrocarbon system. There are three types of these systems: those that pass through a carbon system prior to discharge to the atmosphere, those that discharge directly to the atmosphere, and those that vent to the incineration system.

### 4.1 Carbon Systems

Carbon filters exist on the vent systems in the E-4 decant area, the E-4 repack area, and the E-2 repack area. Weekly inspections are conducted on each of the carbon filters. The inspection consists of checking to see if the carbon is free of impediments, verifying operability of the vent system, checking the carbon level, and checking for organic saturation. Saturation will be determined once a week by venting a container with volatile organic liquid and measuring the hydrocarbon concentration exiting the filters with a PID or equivalent. The carbon will be removed and ultimately incinerated when the reading goes over 500 ppm. These inspections will be documented, and the log sheets will contain the area, date, inspectors name, material removed, operational status, carbon level, and hydrocarbon concentration. If carbon changeout is required, documentation that it was changed will also be provided. The profile number of the waste being vented through the system at the time of the inspection will also be noted on the inspection form.

A carbon adsorption system, consisting of two carbon canisters in series, is used to manage the gas displaced from the tanker (roberoller) while decanting containers with the double diaphragm pump into the roberoller located at the drive through direct burn station. Inspections occur at the beginning, end, and every three (3) hours of continuous operation. The inspection includes monitoring for breakthrough of the primary carbon canister with a PID meter or equivalent. The process will be stopped, and the canister changed out, if there is a reading over 100 ppm. These inspections will be documented and will include the date, time, inspectors' names, sample and background readings, and when a canister is replaced. All spent carbon will be tracked as in-house waste.

#### 4.1.1 Repack Operations

Repack operations occur at the three workstations in building E-2 and the repack area in building E-4. Each workstation and the E-4 repack area is supplied with point source ventilation for the capture of fumes from the repack operations. No container processing will occur at a workstation or the E-4 repack area unless the ventilation system for that particular area is operating. In order to ensure adequate capture velocities, any container that is open in the workstations will be no more than 3 feet from the ventilation hood in workstation 3 or no more than 2 feet from the ventilation hood in workstations 1 or 2. This requirement is only applicable for lab packs when the inner container(s) are opened. The ventilation air from each workstation is pulled by a fan located external to E-2 on the west side of the building. The air from the fan passes through carbon filters before being discharged to the atmosphere. For the E-4 repack area, a fume exhauster is used to pull air from the work room's area to a carbon filter and then to a roof ventilator on top of building E-4.

#### 4.1.2 Decant Operations

The container decant room is in the container processing building, E-4. Liquid is removed from containers and pumped to the tank farm. A fume exhauster pulls across the top of a drum while liquid is removed to the tank farm. The ventilation of the fumes is to a carbon filter and then to atmosphere at the roof of E-4.

#### 4.1.3 Direct Burn Station Double Diaphragm Pump Decant Operations

Decant operations can occur at the drive through direct burn station using a double diaphragm pump. Liquid is removed from containers and pumped to a tanker (roberoller). Exhaust from the roberoller is passed through a flame arrestor and a primary and secondary carbon canister.

### 4.2 Discharge to Atmosphere

#### 4.2.1 Container Storage and Staging

Container storage occurs in the buildings designated as E-1, E-2, E-3, E-4, E-5, E-6, E-7, E-8, 68, 69, 70-East, 70-West, 71-East, and 71-West. Staging containers for processing (feed to the kiln, repacking, decanting, shredding, or any combination thereof) occurs in building E-4.

Fumes are not expected in these areas since containers are kept closed. The buildings have ventilation systems designed to meet the air exchanges specified in the Uniform Building Code (UBC).

#### 4.2.2 Tanker Unloading

The tanker unloading building ventilation meets Uniform Building Code requirements for air exchanges. Waste is exposed to atmosphere only when a sample of the truck load is taken. Pumps are used to unload liquid tankers. The contents of these tankers report to the liquid tank farm.

#### 4.2.3 E-5 and E-8 Fingerprint

Anytime there are waste samples/chemicals present in an E-5 or E-8 fingerprint area fume hood, the fume hood is exhausted to the atmosphere above that building. The fume hoods in the E-5 and E-8 fingerprint areas meet all applicable NFPA requirements.

### 4.3 Vents to Incineration System

There are four systems that vent directly to the incinerator: (1) the deslagger chute, (2) an eductor that vents the glove box in the cylinder feed station, (3) a second eductor that vents the drum pumping station glove box, and (4) the shred tower.

#### 4.3.1 Deslagger Chute

The chute of the deslagger is vented back to the ABC to minimize the release of steam and other emissions. A duct leads from the top of the deslagger chute to the ABC and fumes are drawn into the incinerator by the fan in the duct.

#### 4.3.2 Cylinder Feed Station Glove Box

An eductor vents from the top of the glove box in the cylinder feed station to ports in the south side of the afterburner. An eductor draws a vacuum of 1-2" WC on the glove box and exhausts it to the afterburner. This glove box is only used during emergencies to manage leaking cylinders and will not be used routinely to empty cylinders.

#### 4.3.3 Drum Pumping Station Glove Box

A second eductor vents the drum pumping station glove box. Compressed air to the eductor draws a vacuum of 1" WC in the glove box. If compressed air to the eductor cannot be maintained, the system will automatically switch to nitrogen to continue venting the glove box.

#### 4.3.4 Shred Tower

The shred tower vents from the top of the upper shredder and the purge chamber. A blower draws a vacuum and exhausts it to the afterburner. If the blower fails, the shred system shuts down.

## 5.0 Emissions of Organic Vapors from Equipment Leaks

This section outlines the requirements for complying with the air emission standards for equipment leaks as established in 40 CFR 264 Subpart BB. The requirements include tagging and marking of affected equipment, inspecting, and monitoring the equipment, repairing and reporting equipment leaks, and record keeping.

The regulated equipment includes any valve, pump, flange, grooved pipe connection, pressure relief device, or open-ended valve that is in contact with gas, liquid, or sludge hazardous waste.

In order to eliminate the difficulty and expense of characterizing the organic content of the many waste streams processed at the facility, it will be assumed that all of the gas, liquid, and sludge waste have greater than ten percent organic content and all equipment is considered to be in light liquid service. Thus, all equipment that is used for processing gas, liquid, or sludge waste is subject to these requirements. The physical state of all pumpable hazardous waste is considered to be liquid.

## 5.1 Equipment Tagging and Marking

All equipment subject to these requirements (described above) will be marked with a tag containing a unique equipment identification number. For most of these items the tag will be a weatherproof bar-coded tag. These tags will also have the identification number in human readable form. Flanges that are covered by insulation must also be marked, either by bar coded tags, or by permanently marking the outside of the flange cover. These markings must be plainly visible. New or replaced equipment will also be marked as described above.

A weatherproof repair tag will be attached to any piece of equipment for which there is evidence of a leak (defined below). Each repair tag will be marked with the following information: the date the evidence of a leak was found (date suspected), the date that the leak was actually detected by monitoring (date detected), and the equipment Subpart BB identification number. The repair tag must be left in place before, during, and after repairs. It may be removed from any equipment item, except for valves, after the equipment repairs have been inspected. Repair tags for valves must remain on the valves until each valve has been monitored for two successive months without detecting any leaks.

## 5.2 Inspecting and Monitoring the Equipment

Monitoring in this section means testing with a VOC analyzer in accordance with EPA Method 21. Inspection shall mean a visual inspection for leaks. Leaks shall be defined as (1) hydrocarbon vapor monitor (HVM) instrument readings greater than 10,000 ppm, (2) visual indications of liquids dripping from a pump seal, or (3) physical evidence of leaking (visual, auditory, olfactory, or otherwise).

The pumps at the facility must be visually inspected weekly and monitored monthly. There are no alternative schedules for pump monitoring. Pumps must always be monitored each month regardless of how infrequently leaks are found.

Valves will be monitored on a monthly or quarterly basis. Initially, all valves shall be monitored monthly. For each valve that is not found to be leaking for two consecutive months, the monitoring frequency can be reduced to quarterly monitoring. An alternate frequency may be implemented upon notification of the Director as outlined below.

(1) If fewer than two percent of all the valves within a hazardous waste management unit have detectable leaks for at least two consecutive quarters, all of the valves in that hazardous waste management unit may be monitored on a semi-annual basis.

(2) If fewer than two percent of all the valves within a hazardous waste management unit have detectable leaks for at least five consecutive quarters, all of the valves in that hazardous waste management unit may be monitored on an annual basis.

If the percentage of valves for any hazardous waste management unit exceeds two percent after achieving any of these monitoring frequencies, then the monitoring frequency will revert back to monthly. If after reverting to monthly monitoring, the requirements are again met for the alternate frequencies, then Aragonite may again notify the Director of the facility's intent to comply with the alternate frequency.

There are conservation vents and rupture disks located on each tank farm tank and the large sludge tank. The conservation vents are vented through a closed vent system to a control device (afterburner or carbon canister system) as described in Attachment 14. The flanges around the rupture disks are marked. In the event that a rupture disk releases pressure, the disk will be replaced, and it will be monitored and achieve a standard of no detectable emissions (<500 ppm) within five calendar days of the pressure release.

There are currently no sampling connections in place at the facility. There are also no compressors at the facility that are in use with hazardous waste streams.

An open-ended valve is any valve, except pressure relief valves, having one side of the valve seat in contact with the process fluid and one side open to the atmosphere, either directly or through an open pipe. All open-ended valves that are connected to gas, liquid, or sludge hazardous waste piping must be fitted with a threaded cap or plug, which can be finger tight. The caps or plugs must be in place at all times except when necessary to open the valves during normal use of the equipment. As an alternative, a second valve may be installed in series. If a second valve is used, the first (inner) valve must be closed first, and any hazardous waste allowed to drain or vent before the second (outer) valve is closed so that no process fluid is behind the second valve.

Scheduled monitoring of gasketed flanges, blind flanges, and grooved connectors is not required. If there is physical evidence of a leak, the flange or connector must be monitored within five days of such evidence being noted.

### 5.3 Repairing and Reporting Equipment Leaks

When leaks are found, the first attempt at repair (tightening packing nuts, etc.) must be initiated within five calendar days from the date the leak was found. The repairs must be completed within fifteen days of the discovery of the leak.

Repairs to leaking equipment can be delayed, provided that any of the following conditions are met:

(1) The repair is technically infeasible without shutting down the hazardous waste management unit. Repairs delayed for this reason must be completed before the end of the next scheduled hazardous waste management unit shutdown.

(2) The equipment is valved out and any hazardous waste is removed.

(3) For valves, the emissions resulting from the repair would be greater than the emissions resulting from delaying the repair. The purged material resulting from the repair must be collected and destroyed or captured in a control device.

(4) For valves, repairs beyond the next hazardous waste management unit shutdown are allowed if the valve must be replaced and valve supplies have been depleted (the valve assembly supplies must have been sufficiently stocked before they were depleted). This delay of repair past the next shutdown will not be allowed unless the next shutdown occurs sooner than six months after the first shutdown.

(5) Delays in repairs for pumps are allowed if the repair requires the use of a dual mechanical seal system that includes a barrier system, and the repair is completed as soon as possible but not later than six months from when the leak was detected.

Reports shall be submitted to the Director every six months and shall contain the following information: (1) the name, address, and EPA ID number of the Aragonite facility, (2) for any equipment discovered to be leaking and which was not repaired within the fifteen day limit, provide the identification number, the hazardous waste management unit location, a description of the piece of equipment, and the reason(s) for not completing the repairs within the required time, and (3) dates of any hazardous waste management unit shutdowns. If all repairs were completed within the required time frames, no report will be required.

## 5.4 Record keeping

A database will be maintained that includes all of the required equipment. It will include the equipment identification number, the type of equipment, the hazardous waste management unit to which it is related, dates of inspection or monitoring, the name or ID number of the inspector, physical evidence of the leak (visual, sound, etc.), dates of leak detection, dates of first attempt at repair, and dates the repair was completed. Maintenance work orders will also be prepared and maintained to document the repairs made to the equipment. The identification numbers of all valves that are designated as either "difficult to monitor" or "unsafe to monitor" shall be entered into the database.

The approximate location of each piece of equipment will be shown on drawings to be maintained at the facility. These drawings and the database will be updated to reflect changes that are made to the equipment or piping. The equipment will be grouped into hazardous waste management units. These are defined by functional boundaries (i.e., kiln, front wall, south ABC, etc.)

The records shall include the dates of pressure release, repair dates, and monitoring results for rupture disks. For each pump, it will be specified which method of compliance will be used (either "monthly monitoring" or "equipped with dual mechanical seals"). If repairs to leaking equipment are delayed beyond fifteen days, the reason for the delay will be recorded as well as the expected date of repair. Documentation supporting the delay of repair of a valve beyond the next hazardous waste management shutdown shall be maintained. The statement and signature of the operator (or designee) who made the decision that a repair could not be made without a hazardous waste management shutdown shall also be maintained.

If either of the alternate frequencies for monitoring of valves has been chosen, all supporting documentation (e.g., letters to the Director, monitoring results, calculation of percentage leaking if there are any leaking, equipment lists by hazardous waste management unit, etc.) shall be maintained.

## Table 1 -- NDOs During Normal Operations

| Opening Description | Location Description | Dimensions of NDO | Size ($in^2$) | Comments |
|---|---|---|---|---|
| North Roll Up Door (10'x16') | East side of bulk solids building | ½" x 32' | 192 | Gap around door edge |
| Middle Roll Up Door (10'x16') | East side of bulk solids building | ½" x 32' | 192 | Gap around door edge |
| South Roll Up Door (10'x16') | East side of bulk solids building | ½" x 32' | 192 | Gap around door edge |
| North Roll Up Door (10'x16') | East side of bulk solids building | ½" x 10' | 60 | Gap at top of door |
| Middle Roll Up Door (10'x16') | East side of bulk solids building | ½" x 10' | 60 | Gap at top of door |
| South Roll Up Door (10'x16') | East side of bulk solids building | ½" x 10' | 60 | Gap at top of door |
| Man door 3'x7' (shredder feed chute) | 4th floor, west side | ⅛" x 17' | 25.5 | Gap around door |
| Man door 3'x7' (shredder feed chute) | 4th floor, west side | ⅛" x 3' | 4.5 | Gap under door |
| Man door 3'x7' (crane bay) | 5th floor, south side | ⅛" x 17' | 25.5 | Gap around door |
| Man door 3'x7' (crane bay) | 5th floor, south side | ⅛" x 3' | 4.5 | Gap under door |
| Shredder Camera Opening | Inside west 2nd floor double doors, west side of shredder | 6" x 6" | 36 | Opening into shredder |
| Shredder Camera Light Opening | Inside west 2nd floor double doors, west side of shredder | 6" x 6" | 36 | Opening into shredder |
| Shredder Side Access Door | Inside west 2nd floor double doors, east side of shredder | 4 x 36" x ¼" | 36 | Gaps around door edges |
| Shredder Area Clean Up Door | Inside west 2nd floor double doors, south side of room at floor level | 2 x 12" x ¼" | 6 | Gaps around door edges |
| Shredder Ram Access Door | Inside west 3rd floor door, west side of shredder | 2 x (28" + 28½") x ¼" | 28.3 | Gaps around door edges |
| Shredder Chute Cleanup Doors | Inside west 1st floor opening, ladder to 2nd floor of shredder chute | ((18" x 2 + 52" x 2) + 2 x 4 x 19") x ½" | 146 | Gaps around edges of doors:<br>Two side doors - 19" x 19" (east and west sides)<br>One front door - 52" x 18" (south side) |
| Apron Feeder Dribble Chute (opening) | Inside south 4th floor door, inside apron feeder (door on the east) below back end of conveyor | 72" x 24" | 0 | Not part of enclosure |
| Apron Feeder Feed Chute | Inside south 4th floor door, bottom of feed hopper, above conveyor in apron feeder | 72" x 24" | 1728 | At bottom of chute |
| Dribble Chute Access Door | Inside south 4th floor door, on floor north of east end of apron feeder | 2 x (24" + 24") x ½" | 0 | Not part of enclosure |
| TOTAL | | | 2832.3 | |

Table 2 -- NDOs During Backup Operations

| Opening Description | Location Description | Dimensions of NDO | Size (in$^2$) | Comments |
|---|---|---|---|---|
| North Roll Up Door (10'x16') | East side of bulk solids building | ½" x 32' | 192 | Gap around door edge |
| Middle Roll Up Door (10'x16') | East side of bulk solids building | ½" x 32' | 192 | Gap around door edge |
| South Roll Up Door (10'x16') | East side of bulk solids building | ½" x 32' | 192 | Gap around door edge |
| North Roll Up Door (10'x16') | East side of bulk solids building | ½" x 10' | 60 | Gap at top of door |
| Middle Roll Up Door (10'x16') | East side of bulk solids building | ½" x 10' | 60 | Gap at top of door |
| South Roll Up Door (10'x16') | East side of bulk solids building | ½" x 10' | 60 | Gap at top of door |
| Man door 3'x7' (shredder feed chute) | 4th floor, west side | ⅛" x 17' | 0 | Gap around door, sealed |
| Man door 3'x7' (shredder feed chute) | 4th floor, west side | ⅛" x 3' | 0 | Gap under door, sealed |
| Man door 3'x7' (crane bay) | 5th floor, south side | ⅛" x 17' | 0 | Gap around door, sealed |
| Man door 3'x7' (crane bay) | 5th floor, south side | ⅛" x 3' | 0 | Gap under door, sealed |
| Shredder Camera Opening | Inside west 2nd floor double doors, west side of shredder | 6" x 6" | 0 | Sealed with Visqueen and duct tape |
| Shredder Camera Light Opening | Inside west 2nd floor double doors, west side of shredder | 6" x 6" | 0 | Sealed with Visqueen and duct tape |
| Shredder Side Access Door | Inside west 2nd floor double doors, east side of shredder | 4 x 36" x ¼" | 36 | Gaps around door edges |
| Shredder Area Clean Up Door | Inside west 2nd floor double doors, south side of room at floor level | 2 x 12" x ¼" | 6 | Gaps around door edges |
| Shredder Ram Access Door | Inside west 3rd floor door, west side of shredder | 2 x (28" + 28½") x ¼" | 0 | Gaps around door edges sealed with duct tape |
| Shredder Chute Cleanup Doors | Inside west 1st floor opening, ladder to 2nd floor of shredder chute | ((18" x 2 + 52" x 2) + 2 x 4 x 19") x ½" | 0 | Gaps around edges of doors sealed with duct tape:<br>Two side doors - 19" x 19" (east and west sides)<br>One front door - 52" x 18" (south side) |
| Apron Feeder Dribble Chute (opening) | Inside south 4th floor door, inside apron feeder (door on the east) below back end of conveyor | 72" x 24" | 0 | Cover over opening |
| Apron Feeder Feed Chute | Inside south 4th floor door, bottom of feed hopper, above conveyor in apron feeder | 72" x 24" | 0 | Cover over opening |
| Dribble Chute Access Door | Inside south 4th floor door, on floor north of east end of apron feeder | 2 x (24" + 24") x ½" | 0 | Gap around door edge, sealed |
| TOTAL | | | 798 (5.5 ft$^2$) | |