

# Mulch Processing Facilities

6 NYCRR Part 361-4

## Summary

This document serves as guidance for Mulch Processing Facilities as defined by 6 NYCRR Part 361-4, which took effect November 4, 2017. A copy of this Subpart has been included as an appendix to this document. Similar to other solid waste management facilities, mulch processing facilities have the potential to cause adverse impacts to the environment and human health. DEC is regulating the production and storage of mulch in order to reduce environmental impacts including dust, odor, adverse water quality, and fires.

This guidance does not cover *composting and other organics recycling facilities*, which are regulated under 6 NYCRR Part 361-3. Composting is the aerobic, thermophilic decomposition of organic waste to produce a stable, humus-like soil amendment used as a source of nutrients, organic matter, liming value, etc. *Mulch processing facilities* create a product derived from tree debris, yard trimmings, and other suitable woody material, which is intended for use on soil surfaces to prevent the growth of weeds and minimize erosion.

## Regulatory Overview (please see appendix for full 361-4 text)

Each mulch processing facility is regulated under a different ‘tier’ based on the *total quantity of material on site at any given time*. This includes both incoming material as well as processed material. Once the finished product leaves the facility, this material is not considered a waste (ref: Part 360.12(c)(4)(iii)).

In addition to the types and quantities of materials accepted, facilities will be held to one or more of the following:

- pile size and separation distance restrictions;
- contaminant preclusion and removal;
- the marketing and movement of their product;
- storage restrictions and time frames;
- temperature monitoring and pile restacking (See Page 8);
- the development of run-on and run-off plans; and
- buffer zones from properties and water resources.

Regulatory Tiers	
Exempt	Processing facilities located at the site of waste generation or at a location in the state under the same ownership or control as the site of waste generation. (Part 360.14(b)(1))
	< 10,000 cy on-site – <b>subject to pile size restrictions, 10-foot separation between piles, and incoming material type criteria</b> (Part 361-4.2(b))
	Small (< 1 acre) tree debris disposal sites outside of Long Island – conditions apply (Part 363-2.1(g))
	Storm debris management from a Governor-designated disaster area (Part 361-4.2(c))
	Facilities managing material subject to invasive species regulations such as Emerald Ash Borer or other disease organism restrictions or quarantines (Part 361-4.2(d))
Registered	Total quantity on-site < 25,000 cy, but > 10,000 cy – subject to all design and operating criteria (Part 361-4.3)
Permitted	> 25,000 cy total quantity on-site – subject to all design and operating criteria (Part 361-4.4)

cy – cubic yards

## Incoming Material

Mulch processing facilities can **accept, process, and store** the following materials:

- yard trimmings (other than grass clippings);
- tree debris including tree and shrub parts, including branches, stumps, and trunks, as well as other similar woody vegetation;
- wood debris including unadulterated wood pallets and unadulterated wood that originates from wood product manufacturing or other similar sources; and
- finished mulch products generated elsewhere.

Mulch processing facilities are **not permitted** to accept, process, or store the following materials:

- construction and demolition (C&D) debris; and
- adulterated or contaminated wood.

Note: If the facility also desires to compost yard trimmings, regulation under Part 361-3 also applies.

For the exact definitions of these materials, see Part 360.2(b) numbers (283), (312), and (314).

### Adulterated or Contaminated Materials

Spotting contamination in a waste source or finished product pile can be challenging. Contamination can range from unwanted additions to the pile such as rocks and plastic, to adulterated or contaminated wood products. Physical contaminants can damage the processing equipment, and lead to a low quality product. Adulterated or contaminated wood can pose a significant health risk when exposed to humans, wildlife, and the environment.

Types of adulterated or contaminated wood:

- adhesives and paint;
- creosote-treated wood;
- CCA-treated wood;
- asbestos-contaminated material; and
- other pesticide or pressure treated lumber.



Figure 1 CCA-treated lumber often has a visibly greenish hue



Figure 2 Creosote-treated lumber is found frequently in railroad ties and marine structures



Figure 3 Small contaminants from mulch

Types of physical contamination:

- plastics;
- C&D debris;
- rocks/stones;
- garbage, strings and rope; and
- materials that will readily compost and generate heat.



Figure 4 Plastic-contaminated mulch



Figure 5 Rough grind mulch contaminated with colored plywood



Figure 6 Finished mulch with CCA wood (note how difficult it is to see contamination once mulch is processed)

## Processing

Following Part 361 regulations and best management practices will assist the mulch facility with avoiding *odors and dust, contaminated product, damaging equipment, impacting water resources, and fire events.*

### Pile Types and Grinds

Depending on what the facility produces, there can be many different wood grind sizes and colors of mulch. *Primary*, or *rough*, grind is any material that has gone through an initial machinery grind with the largest pieces measuring roughly 4 to 6 inches long. A *double* or *finely* ground mulch has been further processed, either through the same equipment or with a finer grate/blade setting to make the chips smaller.

Typically, material is treated with a *rough* or *primary* grind initially, and is sold as-is or is further processed into a *double* ground mulch. The finer the grind, the less air flow the pile receives, which increases the risk of hot spots and fires. (See: Fire Safety section)



Figure 7 Single grind mulch



Figure 8 Double grind mulch



Figure 9 Fine ground mulch

Below are some examples of equipment commonly used at mulch processing facilities.



Figure 10 Tub grinder with conveyor



Figure 11 Wood chipper



Figure 12 Horizontal grinder with colorizer

### Odor Issues

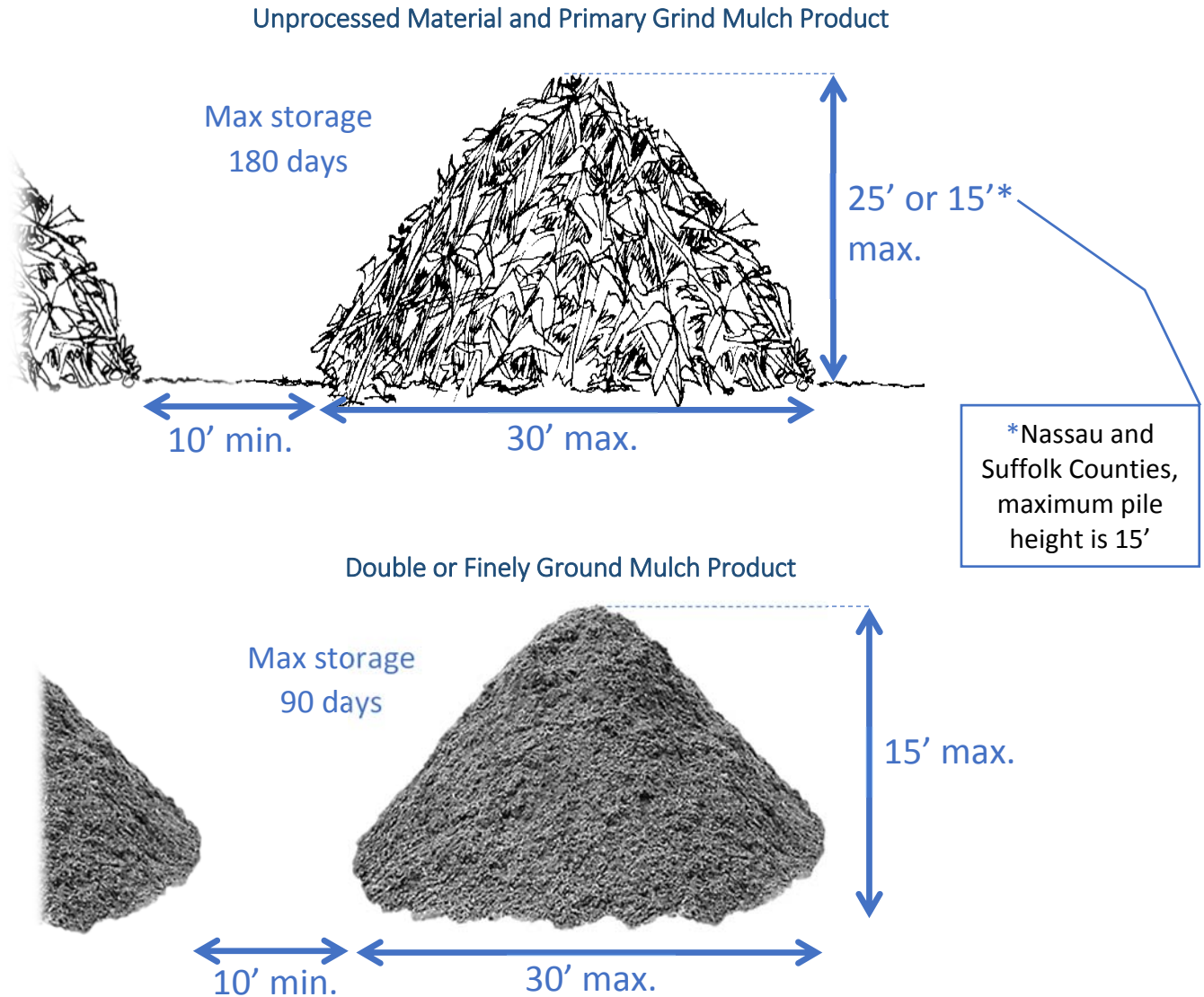
When managed properly, and only exposed to aerobic conditions, mulch piles should not produce objectionable odors. Facilities must be mindful of neighbors – odor inspections should be conducted along the perimeter of the facility, recorded, and any odor complaints need to be addressed. If necessary, the use of odor neutralizing sprays can be implemented. However, it is important to note that objectionable odors from a mulch pile may be indicative of other issues. If piles become too large, hot, or wet, they may undergo anaerobic decomposition, and thus emit odors. For double ground mulch, keeping these piles as a coarse grind while they “age” until they are closer to sale can minimize odor risks. Turning or restacking piles can also help to prevent odors (see: Fire Risk and Safety section), and should be done under wind conditions that minimize offsite impacts.

## Pile Size and Storage Limitations

Pile size limitations in Part 361-4 are based on the type of grind the material has been through as well as the location of the facility. The figures below show maximum pile height and base dimensions as well as the maximum time allowed to store on-site. Grinding mulch beyond a primary/rough grind should factor in enough time before the anticipated sale to meet the maximum storage limits, as mulch sales are seasonal in NY.

*Piles must be triangular in cross-section.* Proper pile sizing will minimize anaerobic conditions within the pile, which will limit odor impacts as well as reduce the risk of fires. (See: Fire Safety section) Pile size restrictions will also reduce the risk of on-site accidents, especially with driven equipment. Local laws or regulations may vary and, in some instances, be more constraining than Part 361-4 limits. This guidance document does not supersede other local, state, or federal requirements.

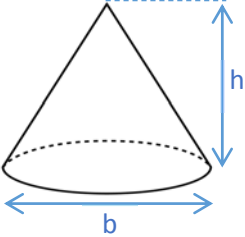

Note: All piles must be at least 10 feet apart. Standing water on the storage area must be minimized.



## Estimating Pile Volume

Mulch piles *must be* approximately triangular in cross-section. The following formulas may be used to estimate the total pile volume:

**Conical**

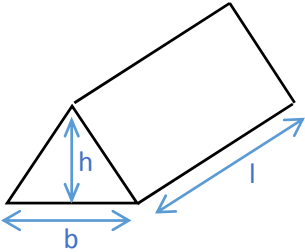



Volume Formula:

$$V = \frac{1}{3} \pi r^2 h$$

(where  $r = \frac{b}{2}$ )

**Windrow or Long Triangular**



Volume Formula:

$$V = \frac{1}{2} bhl$$

## Recordkeeping and Reporting

All facilities must keep records of daily operations and must report annually to DEC by March 1<sup>st</sup> of each year. Annual reporting forms are updated by December 15<sup>th</sup> of each year and can be found on the DEC website at [http://www.dec.ny.gov/chemical/52706.html#Annual\\_Report\\_Forms](http://www.dec.ny.gov/chemical/52706.html#Annual_Report_Forms).



## Site Water Management

Mulch processing sites must take care to prevent water pollution resulting from their processing activities. Because water both entering and exiting the site have the potential to bring in and off contaminants, all registered and permitted facilities must have a written run-on and run-off plan that is approved by DEC.

### Site Design Criteria

Mulch processing facilities must employ best management practices appropriate to their operation to restrict the amount of run-on and run-off generated on the site. Facilities must also adhere to specified buffer zones between property, water features, and all materials (including both processing and storage, listed below).

Buffer Areas	
Feature	Minimum Horizontal Separation Distance (feet)
Property line	25
Residence*	200
Potable water well	200
Surface water	200
State regulated wetland	200

\*Excludes owner's or operator's residence or a residence that existed prior to the effective date of 361-4.

## Water Contamination

### Sources

- Run-on from off site
- Stormwater from structures, covered areas, and impermeable surfaces
- Stormwater contacting unprocessed and processed stored materials and piles

### What makes them a threat?

The water sources listed above can contain many different contaminants:

- BOD/COD
- Nutrients
- Turbidity

It is also possible that organic matter carried by the runoff water can cause the release of elements (iron, manganese, etc.) that already exist in the surrounding soils.



## Preventing Run-On and Run-Off

Run-on and run-off are influenced by many things; the size of the site, physical properties and materials of the pad, topography, location, climate, storm intensity, and rainfall are all possible factors. Below are some examples of best practices used at facilities as run-on and run-off prevention measures. These are examples of measures that may be considered for inclusion in the facility's site water management plan. One critical factor that must always be considered is minimizing the amount of run-on to the site. All run-on should be diverted around the operating and storage areas.



Low permeability pad – strategically sloped to direct water and reduce ponding (with or without runoff collection and treatment).



Bioswales / biofiltration structures; stormwater ditches lined in vegetation, cleaned regularly



Covering piles with breathable fabric



Compost filter socks or berms



Infiltration or storage ponds, sized appropriately for the site

These are just recommendations; each site must develop plans appropriate for the particular site.

## Fire Risk and Safety

Tree debris and wood debris are highly combustible and there are many ways a mulch pile could catch fire, either spontaneously or through human action. These fires are difficult to extinguish and have a high risk of spreading to nearby piles and structures. It is important for facilities to have a plan in place and work with their local fire departments to ensure preparedness in case of a fire emergency (including planning for a reliable water supply).

### ENVIRONMENTAL FACTORS TO WATCH FOR

- Dry weather conditions
- Minimal recent rainfall
- High winds
- Hot ambient temperatures

### AVOIDING FIRE RISK: PREVENTATIVE MEASURES

- Take care concerning the sudden introduction of oxygen/air into a pile (e.g., temperature probing, turning piles, etc.).
- Restack piles to avoid reaching high internal temperatures (See: *Restacking Piles* below).
- Do not compress materials in a pile (See: *Compressing Piles* below).
- Check for overheated machinery or equipment that causes a lot of friction on dry wood.
- Keep piles away from areas where there is a risk of electrical malfunctions and sparks.
- Keep piles away from gas vents.
- Do not allow smoking on the site. Post clear signage to educate visitors.
- Restrict site access to avoid vandalism, especially off-hours.



### Restacking Piles

All *processed material piles* must be turned, or restacked (pulled apart and reassembled), at least once in every 180-day period. This will help avoid reaching dangerous internal temperatures (maximum allowed temperature in Part 361-4 is 140°F) and anaerobic conditions (a lack of oxygen) in the piles.

This can be accomplished simply with a loader or typical compost turner. Site operators will need to ensure that their facility has enough extra space to restack piles. Piles should be restacked when prevailing winds are blowing away from neighbors and other sensitive receptors.

### Compressing Piles

**Myth:** Driving heavy machinery on mulch piles to process them for a better product, compress them for added space, and reach the tops of piles are part of normal operation.



Compressing a mulch pile (making it denser) is known to cause spontaneous fires. When the pile is compressed, aeration is stopped, and the pile becomes anaerobic and begins to 'cook.' Temperatures can easily reach unsafe levels. When oxygen/air is introduced suddenly into a hot, anaerobic pile, flash fires can occur. Keep the piles loose!



### Biodegradation Emits Heat

Because the materials that create mulch are organic, there will be some break down in the piles over time. Wood and tree debris are both have the capacity to biodegrade, thus emitting heat. This is why temperatures must be monitored, just like in compost piles, to avoid issues.



## Temperature Monitoring

Use the *temperature probe* to take measurements at multiple points in the pile, including:

- center of the pile, where the temperature could be highest;
- within visible surface vents\*; and
- beneath growing fungi areas.



Fungi can show where warm, wet air is being emitted from the pile!

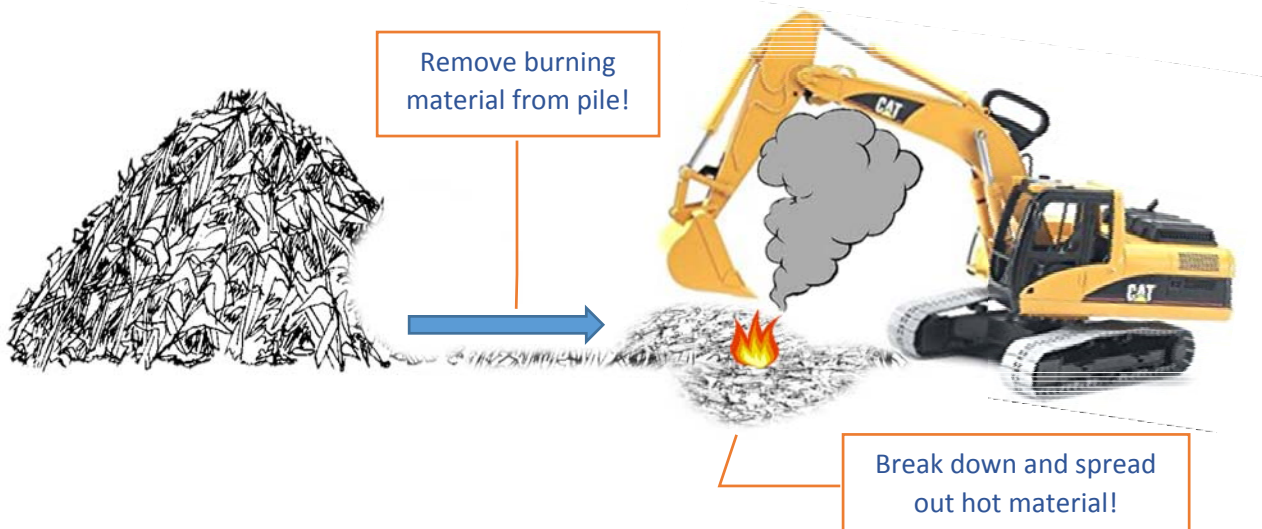
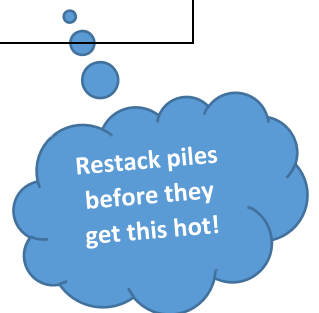


\*Surface vents can show visible vapor, especially during the cooler hours of the day. This will indicate where the warmer areas of the pile are. Probe cautiously! The sudden introduction of oxygen/air can cause a flash fire under the right conditions!

Required Temperature Monitoring Standards		
Pile Type	Monitoring Frequency	Maximum Acceptable Temp.
Unprocessed Piles	2x/month	140° F
Single Grind Mulch	2x/month	
Double or Fine Grind Mulch	Weekly	

## Breaking Down and Cooling a Pile

If piles exceed an internal temperature of 140° F, or if the pile is showing a rapidly increasing temperature, the facility must act to break down and cool the heated pile. Using water wisely is important – **large volumes of water are ineffective at fighting mulch fires**. Flooding the pile will not help with its suppression. The facility should focus on separating the burning material from the greater pile and targeting the hot spot with water while waiting for the local fire department to arrive.



## Fire Safety Summary

### Fire Prevention

- Keep pile sizes small
- Restack piles every 180 days
- Monitor piles, especially double and fine ground piles, looking for maximum 140° F
- Avoid pile compaction and driving machinery over piles
- Keep piles away from facility structures
- Watch for overheating machinery or electrical malfunctions
- Do not smoke at the facility; post signage to avoid cigarette butt disposal on-site
- Secure the site during off-hours to prevent vandalism
- Look for pile surface vents and fungi growing on the surface
- Do not introduce oxygen/air to a hot pile quickly



### If a fire occurs...

- Contact the local fire department and begin to follow the site's emergency plans
- Immediately begin to break down the pile with an excavator or equivalent machinery
- Use water resources strategically, targeting the hot spot of the separated pile  
**\*DO NOT FLOOD PILES!\***
- Keep smoking/smoldering material away from other piles and structures



### After a fire occurs...

- Provide community outreach about the emergency event and the actions taken by the facility
- Reassure the public by making them aware of the facility's emergency plan using newsletters, social media, or another platform
- Review facility operations to determine what caused the fire and the preventative measures that can be taken to avoid fire in the future

# APPENDIX

## 6 NYCRR Part 361-4 Mulch Processing Facilities

The following regulations are part of a rulemaking package associated with 6 NYCRR Part 360: Solid Waste Regulations. For additional information, as well as definitions, please see Part 360 (General Requirements) for all solid waste facilities.

## SUBPART 361-4

### MULCH PROCESSING FACILITIES

- 361-4.1**    **Applicability**
- 361-4.2**    **Exempt facilities**
- 361-4.3**    **Registered facilities**
- 361-4.4**    **Permit application requirements**
- 361-4.5**    **Design and operating requirements**
- 361-4.6**    **Recordkeeping and reporting requirements**

#### **Section 361-4.1 Applicability**

This Subpart applies to facilities that process yard trimmings (other than grass clippings), tree debris, and wood debris into mulch. This Subpart does not govern the processing of construction and demolition (C&D) debris into mulch. The requirements contained in Part 360 of this Title also apply to this Subpart. This Subpart does not apply to:

- (a) a facility that composts yard trimmings. That type of facility, or portion thereof, is regulated under Subpart 361-3 of this Part;
- (b) a facility for combustion or thermal treatment. That type of facility, or portion of one, is regulated under Subpart 362-1 of this Title; and
- (c) a facility that processes wood that is C&D debris. That type of facility, or portion thereof, is regulated under Subpart 361-5 of this Part.

#### **Section 361-4.2 Exempt facilities**

In addition to the exemptions provided in section 360.14 of this Title, the following facilities are exempt from this Subpart:

- (a) A tree debris disposal facility as specified in subdivision 363-2.1(g) of this Title.
- (b) A facility with less than 10,000 cubic yards total,

including storage of incoming material and processed material, provided the piles adhere to the size restrictions found in paragraphs 361-4.3(a)(4) and (5) of this Subpart and ten feet is maintained between piles.

(c) A facility used for the storage and processing of yard trimmings or wood debris that is considered storm debris from an area designated as a disaster area by the governor of New York State, provided criteria specified by the department are followed.

(d) A facility used for the management of materials subject to Emerald Ash Borer (EAB) or other disease organism regulations and other quarantine restrictions required by the department specified within that area.

#### **Section 361-4.3 Registered facilities**

Facilities of the following types are subject to the registration provision of section 360.15 of this Title unless otherwise exempt. In addition to the criteria in Part 360 of this Title, each facility must comply with the operating requirements specified in this section.

(a) A facility with more than 10,000 cubic yards of material but less than 25,000 cubic yards of material, including storage of incoming material and processed material, provided the following design and operating criteria are followed.

- (1) For wood debris, the facility has a program to

preclude the acceptance of contaminated wood and to inspect and remove any contaminated wood that arrives at the site. If the facility accepts pallets, the facility has equipment to remove nails and operate the equipment whenever pallets are being processed.

- (2) The facility does not accept C&D debris.
- (3) Material does not remain on-site unprocessed for more than 12 months.
- (4) All piles of material that contain unprocessed material or material that has gone through a primary rough grind (4 to 6 inch pieces) do not exceed 25 feet high and 30 feet wide at the base and piles are triangular in cross section, except in Nassau and Suffolk County pile sizes do not exceed 15 feet high and 30 feet wide at the base. In all cases, primary grind material is not stored for more than 180 days.
- (5) All piles of double or finely ground mulch do not exceed 15 feet high and 30 feet wide at the base and piles are triangular in cross section. Double or finely ground mulch is not stored for more than 90 days.
- (6) For all piles of double or finely ground mulch, the temperature in the piles is monitored at least once per week, twice per month for other piles. Multiple points in the piles are monitored with emphasis placed on areas that appear to be the hottest such as vents and areas of fungal growth. Probing is done cautiously to avoid introducing air into a hot spot and causing a flash fire. If the temperature is above 140 degrees Fahrenheit or a portion of the pile shows an increasing trend in temperature, the affected material is immediately be broken down and cooled.
- (7) All piles of material, both unprocessed and processed, are separated by at least ten feet.
- (8) Piles of processed material must be restacked as necessary to avoid temperatures above 140F, piles are restacked at least once in a 180 day period.
- (9) Restacking of piles must occurs when winds

are blowing away from sensitive receptors.

- (10) Piles of processed material are piled loosely and not compacted in any manner.
- (11) If a fire occurs, the affected portion of the pile is dismantled and watered to douse the fire or managed in a manner recommended by a local fire department.
- (12) Standing water on the storage area is minimized.
- (13) For the purposes of Part 360 and this Part, precipitation, surface water, and groundwater that has come in contact with wood debris, tree debris, and yard trimmings, both incoming and processed, is not considered leachate, but must be managed in a manner acceptable to the department. The facility must have a written run-on and run-off plan, submitted with the registration request, that is acceptable to the department that outlines the methods that will be used to prevent run-on from entering and run-off from leaving the site and to minimize the movement of organic matter into the soil at the site.
- (14) The following buffer areas from processing and storage are followed:

Feature.....	Min horizontal separation distance (feet)
Property line.....	25
Residence*.....	200
Potable water well.....	200
Surface water and State regulated wetland.....	200

\* Excludes owner’s or operator’s residence or a residence that existed prior to the effective date of this Subpart

**361-4.4 Permit application requirements**

A mulch processing facility that is not an exempt

facility or subject to the registration provisions of section 361-4.3 of this Title must obtain a permit, and must submit an application that demonstrates compliance with the requirements identified in section 360.16 of this Title and a description of how the facility will comply with the operating requirements in Part 360 of this Title and sections 361-4.5 and 4.6 of this Subpart.

### **361-4.5 Design and operating requirements**

A mulch processing facility required to obtain a permit must, in addition to the requirements identified in section 360.19 of this Title, design and operate the facility in compliance with the design and operating requirements specified in section 361-4.3 and the recordkeeping and reporting requirements of section 361-4.3 of this Part. Also, the facility must

have stormwater and run-off controls that minimize the potential for organic matter to reach groundwater and surface water resources.

### **361-4.6 Recordkeeping and reporting requirements**

The following criteria apply to both registered and permitted facilities:

- (a) The facility must keep records as required by subdivision 360.19(k) of this Title.
- (b) The facility must submit an annual report as required by paragraph 360.19(k)(3) of this Title.