

Operations Plan

Arboretum Demonstration Project Site Organics Compost Facility



SPECIALIZED ENVIRONMENTAL
TECHNOLOGIES, INC.



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Jointly Operated by
Specialized Environmental Technologies, Inc. &
Carver County Environmental Services

January 2011

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A. COMPOST OPERATIONS

A.1 Delivery of Material and Daily Operations

The Arboretum Demonstration Project Site Facility is open to commercial waste haulers and staff from the University of Minnesota Landscape Arboretum with pre-arranged agreements that allow them to deliver materials to this site. Residentially generated source separated compostable material (SSCM) and yard waste, brush and stumps delivered by waste haulers and SSCM generated on the U of M Landscape Arboretum grounds will be accepted at the site. No public drop off of materials is allowed at this site.

As part of their pre-arranged delivery agreements, all companies delivering material to the site will be instructed on proper access and departure from the site. Failure to follow these instructions will result in dissolution of their delivery agreements. Trucks may only enter the site traveling in an eastbound direction on SH 5 and may only exit the site traveling in an eastbound direction. This is a right turn in, right turn out site access only.

Volumes are recorded on a gate ticket by a gate attendant for all loads entering and leaving the site. There is no scale for recording the weight of materials.

Tipping areas for yard waste, SSCM, and brush and stumps are indicated on the attached site diagram (Attachment A).

A front-end loader, KW self-propelled windrow turner, a grinder and a screener is used for processing materials. SET will transport equipment from its other sites as necessary.

Yard waste is transported to the composting area and placed into static piles using a front end loader or truck. Brush and stumps are ground into mulch and used in the composting process, to generate electricity or sold as mulch products. Leaves are stockpiled in the area indicated as "feedstock" piles on the diagram. These are then used as feedstock/bulking agents to formulate the appropriate C:N ratios with incoming SSCM.

Best Management Practices for operations are implemented as recommended in the US Composting Council BEST MANAGEMENT PRACTICES (BMPS) FOR INCORPORATING FOOD RESIDUALS INTO EXISTING YARD WASTE COMPOSTING OPERATIONS. SSCM and bulking agents are combined and mixed using a front-end loader and windrow turner as needed. Aerated static piles utilizing positive forced aeration are created. Moisture content of the feedstock is adjusted to 50-60%. Moisture measurements in piles will be measured utilizing the "Squeeze" test as detailed in Attachment B. Feedstocks are utilized in a manner to maintain a C/N ratio in the range of 25:1-30:1. Adequate free air space is maintained and shall be measured utilizing the Bucket Test as detailed in Attachment C.

Static piles and stockpiles will not exceed 12 and 20 feet in height respectively. Each finished pile containing SSCM will be covered with a compost blanket, woodchips or "overs" from the screening process until PFRP has been met as listed in Minn. R. 7035.2836 for aerated static piles. This will improve heat retention, stabilize moisture levels, reduce odor generation, and increase decomposition rates. Composting materials will be turned when temperature and

moisture conditions indicate it is necessary to do so. A turning strategy based on processing parameters such as temperature also helps control offensive odor generation.

The finished compost is screened and analyzed for all parameters required in Minn. R. 7035.2836 and additional parameters outlined in the US Composting Council Seal of Testing Assurance program. This shall be done once per screening event. Additional screened compost will not be added to an already tested pile without the newly screened compost being sampled. Finished compost or mulch will be sold to both commercial and residential customers at another SET location or by delivery. No direct product sales will take place at this site.

A.2 ACCEPTABLE MATERIALS

The facility accepts source separated compostable materials as defined in Minn. Sta. 115A.03 subd. 32a, except for diapers and sanitary products, and yard waste, as defined in Minn.R 7035.0300, subp.12.

The material to be collected and composted under this demonstration project is source-separated household organics co-collected with yard waste and limited commercial organics generated primarily from the University of Minnesota Arboretum. The source-separated organics are made up of the following materials:

Food scraps including:

- Vegetables and fruits;
- Bread, rice, cereals, and pasta;
- Dairy products;
- Eggs, fish, shellfish, meat, and bones; and
- Coffee grounds, filters, and tea bags.

Non-recyclable paper including:

- Food-soiled paper;
- Paper napkins, plates, cups; and
- Paper towels,
- BPI Certified compostable products.

All incoming loads will be visually inspected for unacceptable materials. If any are found, the customer will be asked to remove them or the load will be rejected. Overs from the screening of the finished product will be reincorporated into the compost process for further breakdown, used as pile cover or sold as to end users who desire a coarser grade material.

A.3 SITE CAPACITY

This project proposes to provide 13,000 yards total annual composting capacity of which 20% or 2,600 yards will consist of source separated organics (SSO) material composting. SET has secured contracts to supply bulking materials as well as carbon sources to comply with MPCA requirements regarding Carbon/Nitrogen ratios as well as bulk density testing. There will be both residential mixed loads as well as limited commercial sources of organics delivered to the site.

A.4 HOURS OF OPERATION

The hours are Monday through Friday 7:00 am to 6:00 pm. The Facility is closed on Saturday & Sunday for deliveries. Some site operational activities may take place on Saturday as needed between the hours of 8:00 am – 12:00 pm.

A.5 STORMWATER AND LEACHATE MANAGEMENT ON SITE

The site is graded to prevent the ponding of water. The general grade of the site runs from northeast, the high point, to southwest, the low point. Currently there is no active management of leachate on the site.

For the purposes of the demonstration project leachate/stormwater will be managed by placing a 2'X2' foot compost berm on the southwest end of the site to collect and filter any water leaving the site (see appendix A). In addition a 3" seeded compost blanket will be installed on the north and south side of the berm to absorb runoff before it leaves the site. The 3" seeded compost blanket will extend the length of the berm and be six feet in width.

A.6 COMPOST WATER COLLECTION AND ANALYSIS PLAN

The compost site is designed to capture compost water during the composting process through six (6) buried ceramic tubes under both the commingled residential organics aerated static pile as well as the yard waste only non aerated static pile. Please refer to the Compost Water Monitoring System diagram. Professor Thomas Halbach, from the University of Minnesota will oversee the installation of the lysimeters. Qualitative and quantitative characteristics of compost water generated from the commingled residential organics will be compared to that collected from the yard waste only pile.

The collection points will be located at each pile in the following locations:

- 1) Two lysimeters will be located underneath the piles
- 2) Two lysimeters will be located down slope and in front of the compost water management berms. (*The compost water management berm will be constructed as recommended by the Minnesota Pollution Control Agency including a 3-inch seeded compost blanket is installed on the north and south sides of this berm to help absorb runoff.*)
- 3) Two lysimeters will be located down slope behind the compost water management berms.

There are two lysimeters located at each location for redundancy purposes. A single sample will be taken from each collection area for a total of three samples from the organics pile and three samples from the yard waste only pile. Compost water will be collected at least three times from the ceramic tubes following significant (.5 inches and above) rainfall events between April and November. A rain gauge will be kept on site to quantify rainfall received on site. Carver County staff will be trained by Professor Thomas Halbach on sample collection techniques from the lysimeters. A qualified analytical laboratory will conduct analysis of the samples such as Pace Analytical, Braun Intertec or Minnesota Valley Testing Laboratory.

The following analysis will be conducted on collected unfiltered samples:

- pH
- Total Kjeldahl Nitrogen (EPA Method 351.2), Phosphorus (EPA Method 365.4), and Potassium (EPA Method 200.7)
- Total Dissolved Solids (Standard Method 2540C)
- Total Suspended Solids (Standard Method 2540D)
- CBOD₅ (Standard Method 5210B)
- 503 metals (Arsenic, Cadmium, Copper, Lead, Mercury, Molybdenum, Nickel, Selenium, Zinc) (EPA Method 200.7)
- Total Coliform and E. Coli (Standard Method 9223B)

As there are no current standards for compost water, analytical results will be compared to drinking water standards for comparative purposes only.

A.7 MPCA REQUIREMENTS

The facility is currently permitted by the MPCA under a permit-by-rule (attached). SET will comply with all MPCA requirements as outlined in the MN Rules 7035.2836.

B. HOUSEKEEPING AND NUISANCE MANAGEMENT

B.1. Dust and Blowing Material

Blowing of rejects during screening operations could potentially be a problem on windy days. Portable screens or fencing may be used at the discretion of site personnel, to catch litter downwind from the operation. SET will employ temporary employees to help in the control of the litter if necessary.

Good housekeeping practices will be regularly employed to remove any accumulation of materials or debris that may contribute to the formation of dust. Dust from gravel roads can be minimized using standard construction methods such as the use of water as a dust control. Since the nature of composting operations requires that material remain moist, dusting from the compost and mulch piles will be minimal.

B.2. Odors

Odor generation can be minimized through process control in material handling, good housekeeping, and maintaining aerobic conditions in the static piles. SET will install a weather station to monitor ambient weather conditions. This will include a windsock that will be used to determine when piles are turned. Documentation will be made of all odor complaints, causes and steps to remediate cause of odors will be taken in a timely manner.

B.3. Vectors

Good housekeeping and operation measures will be the primary methods for controlling insects, rodents, and other vermin.

The facility and material handling equipment will be cleaned regularly to help minimize odors and vectors. If a nuisance problem develops, remedial measures will be initiated. Documentation of any vector issues and corrective measures will be maintained.

B.4. Noise

Noise associated with the compost operation includes truck traffic, fixed equipment and safety signals on mobile equipment. Most equipment associated with this type of operation typically create noise levels of about 80 db measured at 50 feet. A regularly scheduled maintenance program will be followed to ensure all equipment is kept in good working order. Documentation of any noise complaints and corrective measures will be maintained.

C. CONTINGENCY ACTION AND EMERGENCY RESPONSE

The purpose of this plan is to identify potential hazards that could endanger human health or the environment and establish procedures that would minimize those hazards.

The plan will be reviewed and modified as appropriate.

C.1. Facility Downtime

If the facility were not operable due to natural disasters, accidents, vandalism or failure on constructed design features, the facility would cease accepting feedstocks. Scheduled deliveries of feedstocks would be diverted to one of our other sites.

C.2. Site Communication

Compost site personnel carry mobile phones with which to communicate with other management and each other if necessary.

C.3. Procedural Manual For Emergency Response

Events which require emergency or corrective action may include:

- Unauthorized access to the Facility
- Fire
- Severe storm
- Serious injury
- Delivery of unacceptable materials
- Spill or leak of vehicle fuel

The person responsible for all emergency response is the site manager. Employees are trained in the proper response to emergencies.

The Facility has a fully stocked first aid kit. Staff attends regularly scheduled safety meetings and is trained in emergency procedures. Staff uses gloves, hard-soled shoes, hard hats, dusk masks, hearing protection and other safety clothing and equipment as necessary.

C.3.1 Unauthorized Access to the Facility

SET and Carver County will control site access to prevent unauthorized traffic from entering the working area.

SET and Carver County reserves the right to refuse Facility access at their discretion. Individuals who gain access to the Facility and are considered unsuitable, will be escorted off site by the Operator to the extent that the Operator deems it safe to interact with the unauthorized individuals. If staff considers the unauthorized individuals to be a threat to their safety or to the safety of authorized users of the Facility, they will contact the Carver County Sheriff Department for assistance.

C.3.2 Fire

All incoming loads will be inspected for any unacceptable materials that might present a fire hazard. Any loads that would present a fire hazard will be rejected and returned to the hauler.

Fire extinguishers are located on site near equipment and by the gate attendant. Woody material is processed in a timely manner. The mulch stockpiles will not exceed 20 feet.

In the event a fire does occur, the site manager will determine if it is necessary to shut down the facility. The Carver County Sheriff's Department will be called. If a small fire or smoldering materials are identified, staff may separate the fire from the bulk of the materials and attempt to extinguish it by using facility fire extinguishers and/or water hoses/water truck. Following a fire, the facility will be inspected for any sign of damage or hazard prior to reopening.

C.3.3 Severe Storm

In the event of a severe storm, the facility may be damaged due to high winds or heavy precipitation. The cost of repairs will depend on the extent of the damage. If the facility was unable to process wastes while repairs were being made, the feedstock deliveries would be canceled and generators would be directed to another SET site.

C.3.4 Serious Injury

The probability of personal injury will be minimized through operator training. Signage clearly indicates traffic patterns into and out of the facility.

Facility employees will be trained in basic first aid so that in the event of bodily injury, first aid will be administered. 911 will be called while first aid is in progress. Appropriate authorities as outlined above will be notified of the accident and a follow up report will be produced.

C.3.5 Delivery of Unacceptable Waste Materials

No hazardous waste, infectious waste, waste oil or radioactive waste will be accepted at the facility. The delivery of these materials highly unlikely since this is a yard waste facility only.

Should any of these materials inadvertently be delivered, the generator and/or hauler will be identified and required to remove the waste. Any hazardous waste will be handled as hazardous waste.

C.3.6 Spill or leak of vehicle fuel

The likelihood of a fuel spill or leak of significant environmental impact is considered very small. There will be no below ground fuel storage tanks used for operations on-site. If there were a spillage, it would be of minor environmental impact. The spilled product will be cleaned up and any contaminated soils would be excavated and treated according to MPCA regulations.

C.3.7 Unscheduled Shutdown

At the discretion of the Owner and Operator, the Facility can shut down due to emergency situations. If the shutdown is due to an emergency situation, the Operator will follow all applicable emergency response steps and procedures before starting the unscheduled shutdown cycle. The unscheduled shutdown cycle procedures will include the following:

1. Call SET and Carver County

- Notify contracted haulers, its reasons, and expected duration.
- If shutdown will be extended due to heavy weather damage or other unusual event, staff will notify the MPCA.

2. Close and Lock Entrance Roadway Gates

- Construct “Unscheduled Shutdown” signs to declare the Facility closed and provide a number to call for questions.
- Close and Lock entrance roadway gates. Hang “Unscheduled Shutdown” sign on the gates.

3. Complete Routine On-site Operational and Closure Activities

- **Short-term Shutdown:** Complete as many remaining activities as possible under conditions.

- **Extended Shutdown:** Complete routine daily operational activities, if possible. Process all remaining material. Complete all other routine on-site closure activities.

C.4. COMMUNICATIONS PLAN FOR ADDRESSING CITIZEN CONCERNS

Citizen concerns are of top priority. Staff is instructed to respond to citizen concerns as outlined below:

1. Staff will maintain a community notification list of those residents who would like advance notice of site operations that may create temporary odors, temporarily increased traffic to the site, or temporary increased noise.
2. Complaints will be handled as follows: Site staff will record the call in detail including time and date, caller's name, address and phone number, and a detailed description of the concern. A complaint log will be maintained at the site.
3. Site staff will contact SET management immediately.
4. SET management will contact the resident immediately to obtain further information on the citizen's concern.
5. **Odor:** Personnel will walk the facility to identify the source of the odor including the scale, pads and pond. Operations will also be investigated. Current weather conditions will be recorded including wind direction, temperature, rainfall, etc. Once the source of odor has been identified, procedures to alleviate the problem will be implemented. This may include ceasing to turn piles, adding moisture, mixing in bulking agent and others.
6. **Litter:** If the citizen concern is litter, staff will be dispatched immediately to clean up the problem area.
7. **Other:** Citizen concern regarding dust, vector control or any other problem will be dispatched to our staff for immediate response.
8. Once the problem has been identified and a course of action decided upon, staff will contact the citizen to inform them of the measures being taken to address their concern.

D. Personnel Training

Facility personnel will be trained in all procedures relevant to their positions including contingency action implementation and compost quality data collection. Training will be provided in the following areas:

- using, inspecting, repairing and replacing Facility emergency and monitoring equipment
- activating communication and alarm systems

- procedures for ceasing feedstock deliveries
- appropriate response to fire and other emergencies
- responding to surface water pollution incidents
- procedures for managing incoming waste other than acceptable wastes
- rejecting waste not accepted at the Facility
- feedstock quality control
- mixing feedstocks
- PFRP requirements and documentation
- temperature reading in compost system
- proper sampling techniques for samples to be analyzed by independent laboratories
- data entry and record keeping
- safety
- equipment operation
- Compost site employees will be sent to one of several compost courses such as those offered by the University of Minnesota and the United States Composting Council where appropriate. Re-training will take place when needed.

E. CLOSURE PLAN

The Closure Plan has been developed for use in the event that SET and Carver County decides to permanently close the Facility.

E.1. Dates of Operation

The closure date of the Facility is not specified at this time.

E.2. Site Contact

Contact persons for the Facility are:

Ken Tritz and Anne Ludvik.
Specialized Environmental Technologies
6321 Bury Dr. #13
Eden prairie, MN 55346
(952) 946-6999

Marcus Zbinden
Carver County Environmental Services
600 E. 4th Street
Chaska, MN 55318
(952) 361-1800

E.3. Notification of Final Closure

At the time of final closure, a list of contacts for the Facility will be submitted to the MPCA. The contacts list will include names, addresses, and telephone numbers of individuals who are knowledgeable about the Facility design, construction, maintenance, closure, and potential future uses of the Facility.

The MPCA will be notified of the projected closure date in writing at least 90 days prior to initiating closure activities at the Facility. Customer will also be notified on writing. A notice will be posted at the entrance of the Facility indicating the date of the closure and provide a listing

of other facilities accepting similar materials at least 60 days before closure. A notice will also be published in the local newspaper 30 days prior to the closing.

Final closure activities will begin within 30 days of receiving the last shipment of waste. Following completion of final closure activities, a date and time for a final closure inspection by SET/Carver County will be established. The MPCA will also be notified of the date and time of this final closure inspection. The purpose of this inspection is to verify complete physical closure of the processing facility.

E.4. Closure Activities and Cost

At the time of the Facility closure SET and Carver County will jointly coordinate and share responsibility and expense for the following:

- Remove and transport all remaining waste to an appropriate composting facility.
- Remove all finished compost off site.
- Remove all equipment off site.
- Provide for the continued security and maintenance of the Facility.

Attachment A

Arboretum Project Site Diagram



Attachment B

The Squeeze Test

Squeeze test: Field Measurement of Pile Moisture Percent

Mix moisture percent can be approximated by squeezing a handful of material as follows:

1. Reach into the pile and take a handful of material
2. Squeeze the handful of material firmly
3. Release your grip and inspect the material you squeezed in your hand.

Interpretation of results:

1. If the material you squeezed is crumbly and doesn't stick together, and your hand is dry, the material is about 40% moisture or less.
2. If the material you squeezed sticks together, and your hand is moist, the material is around 50% moisture
3. If the material you squeezed sticks together and drips, and your hand is wet and dripping, the material is around 60% moisture or more.

With practice you can distinguish 55% moisture, from 50% and 60% moisture.

Attachment C

The Bucket Test

Five-Gallon Bucket Test

Materials needed:

- five-gallon pail
- one-gallon pail
- typical mix of materials added to the compost pile (horse manure, wood shavings, straw, etc.)

Fill the five-gallon pail one-third full with a mixture of typical compost materials. Drop the pail 10 times from a height of six inches onto a concrete floor or sidewalk. Be careful not to spill any of the compost materials.

Add more material to fill the five-gallon pail two-thirds full. Drop the pail 10 times from a height of six inches.

Fill the five-gallon pail up to the top. Drop the pail 10 times from a height of six inches. Fill the five-gallon pail to the top once again. Add water to the five-gallon pail, keeping track of how much you can fit in before it overflows. If you can add 2-1/2 to 3 gallons of water, you have adequate free air space. If not, you need to add more bulking material, such as straw, coarse wood chips, or shredded bark. If you can add more than 3 gallons of water, you have too much free air space. The particle size must be reduced by shredding or grinding the compost materials or by mixing finer materials into the compost.