



Mike DeWine, Governor
Jon Husted, Lt. Governor
Laurie A. Stevenson, Director

June 25, 2019

Roe Transportation, Inc.
3680 W. Michigan St.
Sidney, Ohio 45365

**Re: Roe Transportation, Inc.
Director's Final Findings and Orders (DFFO)
DFFO
Composting
Shelby County
CM010346**

Subject: Final Findings and Orders of the Director

Dear Sir or Madam:

Transmitted herewith are the Final Findings and Orders of the Director concerning the matter indicated for Roe Transportation, Inc.

You are hereby notified that this action of the Director of Ohio EPA (Director) is final and may be appealed to the Environmental Review Appeals Commission pursuant to Section 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. The appeal must be filed with the Commission within thirty (30) days after notice of the Director's action. The appeal must be accompanied by a filing fee of \$70.00 made payable to "Treasurer, State of Ohio." The Commission, in its discretion, may reduce the fee if by affidavit it is demonstrated that payment of the full amount of the fee would cause extreme hardship. Notice of the filing of the appeal shall be filed with the Director within three (3) days of filing with the Commission. Ohio EPA requests that a copy of the appeal be served upon the Ohio Attorney General's Office, Environmental Enforcement Section. An appeal may be filed with the Environmental Review Appeals Commission at the following address:

Environmental Review Appeals Commission
30 East Broad Street, 4th Floor
Columbus, Ohio 43215

If you have any questions, please contact Teri Finrock at (614) 644-3037.

Sincerely,

Jeri Main, Administrative Professional Unit
Division of Materials & Waste Management

Enclosure

cc: Teri Finrock, Legal
Jill Olberding, DMWM, SWDO
Angel Arroyo, DMWM, CO

Issuance Date: JUNE 25, 2019

Effective Date: JUNE 25, 2019

**BEFORE THE
OHIO ENVIRONMENTAL PROTECTION AGENCY**



IN THE MATTER OF

Roe Transportation, Inc.
3680 W. Michigan St.
Sidney, Ohio 45365

:
:
:

Director's Final
Findings and Orders

I. JURISDICTION

Ohio EPA JUN 25 '19
Entered Directors Journal

These Director's Final Findings and Orders ("Orders") are issued to Roe Transportation, Inc. ("Respondent"), pursuant to the authority vested in the Director of the Ohio Environmental Protection Agency ("Ohio EPA") under Section 3734.02(G) of the Ohio Revised Code ("ORC") and Rule 3745-500-220(B) of the Ohio Administrative Code ("OAC").

II. PARTIES BOUND

These Orders shall apply to and be binding upon Respondent. No change in ownership of the Property as defined herein shall in any way alter Respondent's obligations under these Orders.

III. DEFINITIONS

Unless otherwise stated, all terms used in these Orders shall have the same meaning as defined in ORC Chapter 3734 and the rules promulgated thereunder.

IV. FINDINGS

The Director of Ohio EPA ("Director") has determined the following findings:

1. Respondent is the owner and operator of a class IV composting facility, Registration number 75-C4R-0843, located at 3680 W. Michigan Street in Sidney, Shelby County, Ohio, 45365.
2. On February 13, 2017, Respondent submitted to Ohio EPA a request for approval of a pilot project to compost spent bleaching earth (SBE) generated by the Cargill, Inc. (Cargill) facility in Sidney, Ohio, by composting the SBE blended with yard waste, bulking agents, and agricultural plant materials. A revised version of this request was submitted on January 5, 2018.

3. On March 12, 2018, the Director issued Orders approving the pilot project, which had an expiration date of one hundred and eighty days from the effective date of the Orders.
4. Respondent did not start the project within one hundred and eighty days, hence the approval has expired.
5. On May 1, 2019, Respondent informed Ohio EPA of their intent to start the pilot project.
6. New Orders are required for reauthorization of the pilot project.
7. OAC Rule 3745-560-410(B) specifies that the owner or operator of a class IV composting facility "shall only accept yard waste, bulking agents, and additives limited to urea and bacterial or fungal inoculum."
8. OAC Rule 3745-560-210(B) specifies that the owner or operator of a class II composting facility "shall only accept yard waste, agricultural plant materials, dead animals, raw rendering material, animal waste, food scraps, bulking agents, and additives" and "alternative materials, as approved by the director pursuant to rule 3745-560-205 of the Administrative Code".
9. The SBE from Cargill consists of PURE-FLO® Perform® 5000, a bleaching earth manufactured by OilDri Corporation of America, Chicago, Illinois, that is used to filter food-grade soybean oil and that retains between 20 to 30 percent of the soybean oil. Because the SBE is generated during a food processing activity, it meets the definition of food scraps and may not be accepted at a class IV facility unless an exemption allowing acceptance without being registered and licensed as a class II composting facility has been granted by the Director.
10. ORC Section 3734.02(G) and OAC Rule 3745-500-220(B), provide in relevant part: "the Director may exempt any person generating, collecting, storing, treating, disposing of, or transporting solid wastes, in such quantities or under such circumstances that, in the determination of the director, are unlikely to adversely affect the public health or safety or the environment from any requirement to obtain a registration certificate, permit, or license... or other requirements of ORC Chapter 3734." "or any rules adopted thereunder." "Such an exemption shall be consistent with and equivalent to any regulations adopted by the administrator of the United States environmental protection agency under the 'Resource Conservation and Recovery Act of 1976,' 90 Stat. 2806, 42 U.S.C.A. 6921, as amended, except as otherwise provided in this chapter."
11. Based upon a review of Respondent's request, Ohio EPA has determined that granting an exemption to Respondent from the requirements for establishing a

class II composting facility in OAC Rule 3745-560-200 for the duration of the pilot project, at the Respondent's class IV composting facility located on 3680 W. Michigan Street in Sidney, Ohio, is unlikely to adversely affect the public health or safety or the environment.

V. ORDERS

1. Pursuant to ORC Section 3734.02(G) and OAC Rule 3745-500-220(B), Respondent is hereby granted an exemption from the requirements for establishing a class II composting facility in OAC Rule 3745-560-200 for the duration of the pilot project, at the Respondent's class IV composting facility located at 3680 W. Michigan Street in Sidney, Ohio, provided Respondent performs the activities in accordance with Respondent's request received on January 5, 2018, the pilot project plan in Attachment A, and these Orders.
2. These Orders revoke and replace the Orders dated March 12, 2018, including an updated version of Attachment A, the pilot project plan.
3. This exemption is issued solely to the Respondent's class IV composting facility located at 3680 W. Michigan Street in Sidney, Ohio. This exemption is not transferrable upon change of ownership of the Facility. This exemption is not transferrable to any other person. This exemption is not transferrable to Respondent's establishment or operation of a composting facility located on any other property owned or operated by Respondent, other than the Property specified herein.
4. Composting of the materials approved in this exemption shall occur in the area dedicated solely for the pilot project, as identified in the facility's pilot project plan view drawing.
5. Nothing in these Orders shall be construed to authorize any waiver from the requirements of any applicable federal or state laws or regulations except as specified herein. These Orders shall not be interpreted to release Respondent from responsibility under ORC Chapters 3704, 3714, 3734, and 6111; under the Federal Clean Water Act, the Resource Conservation and Recovery Act, or the Comprehensive Environmental Response, Compensation, and Liability Act.
6. This exemption shall expire upon the occurrence of either of the following, whichever occurs the earliest:
 - a. One hundred eighty (180) days after its effective date unless Respondent submits the Phase I interim reports required in Section VII of the SBE pilot project plan (Attachment A), and then requests and is granted authorization for continuation of the pilot project; or

- b. Upon termination of the registration for the Respondent's class IV composting facility located at 3680 W. Michigan St. in Sidney, Ohio, in accordance with OAC Rule 3745-560-401(B).
7. Absent the facility's registration and license as a class II composting facility, Respondent shall dispose of all materials remaining in the facility's pilot project area at a licensed solid waste landfill upon expiration of this exemption pursuant to Order 6.
8. Other than as specified herein, these Orders shall not be construed to release Respondent from any other obligation under ORC Chapter 3734 and OAC Rule 3745-560 applicable to the owner or operator of a class IV composting facility, including the requirement to conduct closure in accordance with OAC Rule 3745-560-435.
9. The Director of Ohio EPA may revoke these Orders for any reason, including but not limited to Respondent's failure to comply with any of these Orders or a determination by the Director that the activities performed pursuant to these Orders threaten or adversely affect public health or safety or the environment.

VI. OTHER APPLICABLE LAWS


All actions required to be taken pursuant to these Orders shall be undertaken in accordance with the requirements of all applicable local, state, and federal laws and regulations. These Orders do not waive or compromise the applicability of any other statutes or regulations.

VII. RESERVATION OF RIGHTS

Nothing contained herein shall be construed to prevent Ohio EPA from seeking legal or equitable relief to enforce the terms of these Orders or from taking other administrative, legal, or equitable action as deemed appropriate and necessary, for noncompliance with these Orders. Nothing contained herein shall be construed to prevent Ohio EPA from exercising its lawful authority to require Respondent to perform additional activities pursuant to ORC Chapter 3734 or any other applicable law in the future. Nothing herein shall restrict the right of Respondent to raise any administrative, legal, or equitable claim or defense with respect to such further actions which Ohio EPA may seek to require of Respondent. Nothing in these Orders shall be construed to limit the authority of Ohio EPA to seek relief for violations that may occur at the Property.

IT IS SO ORDERED:

Ohio Environmental Protection Agency



Laurie A. Stevenson
Director

Attachment A: SBE Composting Pilot Project Plan

I. Pilot Project Purpose

The purpose of this pilot project is: (1) to determine the feasibility of composting as an option for bioremediation of spent bleaching earth (SBE) from the food industry, based on available composting materials and Ohio's climatic conditions; and (2) divert SBE from landfills by incorporating it into a marketable compost product.

II. Background

Spent bleaching earth (SBE) is generated by Cargill, Inc. (Cargill) and similar companies within the food industry. The Cargill facility in Sidney, Ohio, generates daily truck-loads of SBE approximately four tons each, 350 days a year for an approximate total of 1,400 to 1,500 tons per year. The SBE is currently being disposed at the Rumpke Sanitary Landfill in Hamilton County, Ohio.

The SBE from Cargill consists of PURE-FLO® Perform® 5000, a bleaching earth manufactured by OilDri Corporation of America, Chicago, Illinois, that retains between 20 to 30 percent soybean oil during the oil purification process.¹ The PURE-FLO® Perform® 5000, is a bentonite clay that has been treated with an acidic solution of sulfuric acid (<5%) to increase its filtration effectiveness.^{2a} Bleaching earths treated with acidic solutions are used for filtration of oils by food processors all over the world. Other manufacturers of bleaching earths might use a different acid to improve the filtration effectiveness of the bentonite clay, but regardless of the acids used, the bleaching earth should perform equally for oil filtration.^{3a}

Test results provided by Cargill (Appendix A), shows that the SBE would meet the compost quality standards before incorporating into a composting mix, hence we can reasonably expect that a marketable compost product can be obtained. While SBE does not contain contaminants that threaten human health or the environment, it does present a management challenge as the oil retained by the bleaching earth can rapidly oxidize via clay-catalyzed auto-oxidation reactions and generate heat and even spontaneously combust. Proper mitigation procedures and precautions must be taken to dissipate heat and prevent spontaneous combustion.^{3b} Mitigation precautions recommended by bleaching clay manufacturers include dissipating heat by spreading out the SBE, spraying with water, and avoiding excessive blowing with air.^{2b} Cargill takes further steps by placing water cooled SBE in smaller roll-off containers to minimize the formation of high heat zones, and keeping the container under shaded cooled areas during the summer months.

The heating and combustion risk is a characteristic of all SBEs resulting from filtration of vegetable oils. This is not a problem unique to Cargill's Sidney location. Finding an environmentally sustainable management option for SBE will benefit all food processors in Ohio and provide a model that could be used nationally and internationally. Research shows that the heating and combustion risk is eliminated from SBE once the vegetable

oil is naturally biodegraded, however this can take over six months to happen and would require enough space and labor to store SBE with the mitigation procedures needed initially. Mixing the SBE with topsoil or compost product can be an effective mitigation option as it minimizes the formation of heat zones and allows soil microorganism to biodegrade the oils faster, but this takes about six months. Research indicates that mixing SBE with soil or compost will immediately reduce the heat and combustion risk, but because the oil is still present, the mix will repel water, so it can't be used as plant growth media until the oils are biodegraded by microorganisms.⁴

Due to the challenges of the two options above, researchers have looked at mixing the SBE with fresh compostable materials such as shredded yard waste and wood chips, which would allow for microorganisms to compost/biodegrade the oil at the same time as the fresh material is being composted.^{3c,5} Composting has been demonstrated to be an effective method to quickly reduce the combustion risk and biodegrade the oil in a much shorter period (25 to 45 days expected range depending on the compostable materials). Similar to mixing SBE with soil and compost product, initial mixing with fresh compostable materials dissipates the heat and reduces the possibility of SBE heat zones. Mixing also exposes composting microorganisms to the oil, providing them with nutrients that speed up their metabolism and resulting in the biodegradation of the oil in a shorter time. The bentonite clay in the SBE itself will not compost, as it is already a mineral. However, composting SBE should result in a compost product enriched with clay, making it more valuable for manufacturing soils.⁶

Under current composting regulations, SBE is considered a food waste, thus, it can only be accepted at class II composting facilities. The interest for composting SBE is increasing as Ohio companies strive to achieve zero waste goals. Currently there are not enough class II composting facilities in the state to meet current demand by Ohio's food industry. For this reason, Ohio EPA is interested in determining if SBE can be successfully composted when implementing proper management of the SBE upon receipt at the composting facility. Roe Transportation, Inc. and Cargill's pilot project proposal presents an opportunity for Ohio EPA to investigate this possibility.

III. Roe Transportation Inc., Class IV Composting Facility Description

The pilot project will take place at the Roe Transportation, Inc. class IV composting facility (Facility) located at 3680 West Michigan Street in Sidney, Ohio, 45365. The Facility is registered (#75-C4R-0843) and has operated as a class IV composting facility since 2002. The Facility typically receives pallets, clean wood waste, and yard waste, and produces compost, mulch, and top soils.

Composting of the SBE will occur in an isolated area dedicated solely for the pilot project, at the north edge of the current Class IV operations, as identified in the facility plan view drawing (Appendix B). The area is a grassy area that will be graded and prepared to allow for management of surface water.

The barn building directly east of the project site may be used for storage of compost containing SBE that has been tested and met the quality standards required in this Pilot Project Plan and considered to be a compost product.

The following equipment is available for management of the pilot project material: wheel loaders, bulldozer, excavator and soil/compost mixer.

IV. Generation and Characterization of Cargill's SBE

Cargill's Sidney facility currently generates daily truck-loads of SBE approximately four tons each, 350 days a year for an approximate total of 1,400 to 1,500 tons per year. The SBE from Cargill is currently being disposed of at Rumpke Sanitary Landfill in Hamilton County.

The SBE from Cargill consists of PURE-FLO® Perform® 5000, a bleaching earth manufactured by OilDri Corporation of America, Chicago, Illinois, that retains between 20 to 30 percent soybean oil during the oil purification process. The PURE-FLO® Perform® 5000, is a bentonite clay that has been treated with an acidic solution of sulfuric acid (<5%) to increase its filtration effectiveness.

Upon generation, the SBE is cooled down by mixing/aeration and adding a small amount of water, then stored in a roll-off container in a shaded area until pick up for disposal.

Analytical results for Cargill, Inc.'s SBE and Material Safety Data Sheet for PURE-FLO® Perform® 5000 are found in Appendix A.

V. SBE Management Requirements

Loads of approximately four (4) tons will be received daily. The Facility shall take measures to ensure the risk of heating and combustion in the SBE is minimized during the transport and delivery to the Facility and prior to incorporating into a composting mix. The Facility shall:

1. Record the temperature of the SBE loads upon pick up at Cargill's Sidney facility and upon delivery at the Facility. This information shall be sent electronically to Ohio EPA every seven days or as requested by Ohio EPA to the e-mail address provided in Section VII.
2. Loads stored at Cargill with temperatures above 130°F shall not be accepted for transportation to the Facility until Cargill takes measures to cool down the load.
3. Loads for which the temperature rose above 130°F during transportation shall be immediately cooled down upon receipt at the Facility by:
 - a. Removing from the roll-off container and spreading the SBE on a surface to dissipate heat; or
 - b. Mixing it thoroughly with feedstocks or bulking agents; or
 - c. Adding water.

4. The Facility shall implement measures to collect and appropriately manage any observable non-absorbed liquids in the incoming loads or while cooling down the loads.
5. Any load that cannot be managed as required above shall be rejected and arrangements for delivery to a licensed solid waste landfill shall be made on the same day the load was rejected.

VI. Composting Process Management Requirements

The pilot project is divided into two phases. Phase I is intended to test the performance of feedstocks and bulking agents and finding an optimum recipe that will result in faster biodegradation of the soybean oil, and determining the length of time required for the oil to be completely biodegraded in the composting mix. At the end of Phase I, the Facility should be able to identify the optimum SBE and materials recipes and the length of time required to biodegrade the soy bean oil. Phase II is intended for replicating the most effective recipes to verify their effectiveness and the length of time required to biodegrade the soy bean oil.

(A) Phase I

The Facility will perform this phase as described below. The Facility may submit written requests for variations from the requirements to Ohio EPA. The request must explain the need for the variation and include any applicable supporting documentation. Variations may be implemented after receiving written concurrence from Ohio EPA. The Facility shall send written notification to Ohio EPA at least seven (7) days prior to first acceptance of SBE.

Phase I Project Design

1. The amount of SBE incorporated shall not exceed 20% by volume of the composting mix.
2. The Facility may use the following feedstocks and bulking agents:
 - a) Yard waste as defined in OAC 3745-500-02.
 - b) Agricultural plant materials as defined in OAC 3745-560-02
 - c) Bulking agents limited to wood chips, straw, clean untreated wood, shredded cardboard, sawdust, shredded brush, and stover.
3. Each load of SBE shall be blended with the intended feedstocks and bulking agents on the day it was received.
4. The blended material shall be placed in windrows with the approximate size of ten (10) feet wide, six (6) feet height and one hundred (100) feet in length.
5. A maximum of eleven (11) windrows shall be constructed during Phase I. At an SBE acceptance rate of four (4) tons per day, it is estimated that it would take about 85 days to complete the construction of the first eleven (11) windrows.
6. There shall be a minimum twenty (20) feet of separation between windrows to allow for passage of equipment without disturbing other windrows.
7. A minimum of one windrow shall be constructed using yard waste as the sole bulking material.

8. Windrow temperatures shall be measured at least every three (3) days to monitor the composting process and ensure the mix is actively composting within a range of at least 121°F to 140°F. The Facility may turn windrows whenever it's deemed necessary by Ohio EPA or the Facility to maintain optimum composting conditions. However, windrows shall be turned whenever temperatures reach or exceed 160°F to ensure the heat does not kill the composting microorganisms.
9. The following information shall be tracked during Phase I:
 - a) Bulking material used for each windrow, including the inclusion rate if more than one material was used. For example: 20% SBE, 50% yard waste, and 30% shredded cardboard.
 - b) Date that each windrow was started and date windrow construction was completed.
 - c) Temperatures.
 - d) Dates when windrows are turned.
 - e) Observations on windrow moisture content: Dates water was added because windrow was too dry, and dates that windrows were turned because they were too wet, as applicable.
 - f) Dates samples for testing are taken.
 - g) Any other observation Roe Transportation considers useful for demonstration of the success of the project, future improvements, and replication at other facilities.
10. Phase I windrows shall be considered a compost product and distributed when the composting mix in each windrow constructed has no detectable soybean oil, meets the pathogen standards in Table 4, has been tested for the general parameters in Tables 5 and 6, and upon written concurrence from Ohio EPA after review of the interim report for the windrow. Phase I has ended once Ohio EPA provides written concurrence for all 11 interim windrow reports.

(B) Phase II

The Facility will perform this phase as described below. The Facility may submit written requests for variations from the requirements to Ohio EPA. The request must explain the need for the variation and include any applicable supporting documentation. Variations may be implemented after receiving written concurrence from Ohio EPA.

Phase II Project Design

1. Phase II may start when the first Phase I windrow has been determined to be compost product, per the testing requirements and upon written concurrence from Ohio EPA after review of the test results, and removed from the pilot project area.
2. Phase II windrows shall be constructed, monitored, and tracked according to conditions 2 to 7 and 9 to 10 in Phase I, except for improvement variations requested by the Facility and approved by Ohio EPA.
3. Phase II windrows will be constructed on space vacated from Phase I windrows. No more than 11 windrows shall be constructed at one time.
4. Phase II windrows shall be considered a compost product and distributed when the composting mix in each windrow constructed has no detectable soybean oil,

meets the pathogen standards in Table 4, has been tested for the general parameters in Tables 5 and 6, and upon written concurrence from Ohio EPA after review of the and after Ohio EPA has reviewed the analytical results and has given written concurrence.

VII. Project Reporting Requirements

1. All electronic correspondence regarding this pilot project shall be sent to: SWDODMWM.Submittals@epa.ohio.gov
2. During Phase I, the Facility shall submit to Ohio EPA written interim reports for each windrow including, but not limited to, copies of the analytical test results, observations on the performance of the materials mix used for the windrow and lessons learned.
3. Within thirty (30) days of completion of Phase II, the Facility shall submit to Ohio EPA a pilot project report containing, at a minimum, a summary of the results of the pilot project, recommendations or lessons learned, and copies of test results.
4. The Facility shall submit any other information requested by Ohio EPA upon review of the interim windrow reports or final pilot project report.

VIII. Compost Sampling, Analytical Testing & Compost Product Distribution Requirements

This section specifies the compost sampling methodology, sampling and testing schedule, analytical tests to be performed, and when the compost can be considered a compost product for distribution.

1. Sampling methodology.
 - a. Individual composting windrows shall be sampled according to Method 02.01 "Field Sampling of Compost Materials" of the Test Methods for the Examination of Composting and Compost, U.S. Composting Council's Seal of Testing Assurance Program, issued on August 27, 2001, included in Appendix C.
 - b. The Facility shall contact an analytical laboratory and obtain instructions for the proper handling of the sample and attach the instructions to the pilot project records.
2. Sampling and Testing Schedules.

Testing of Phase I and Phase II windrows will follow the sampling schedules outlined in Tables 1 and 2 below. Day one (1) is the first day that a windrow is formed.

Table 1. Phase I Sampling and Testing Schedule.

Parameters	Day 1	Day 15	Day 30	Day 45	Prior to Distribution
Oil content, Table 3	Always must test.	Always must test.	Dependent on Day 15 results. ¹	Dependent on Day 30 results ¹ .	Yes, must sample prior to distribution. ¹
Pathogens, Table 4	No testing required.	Testing optional, not required.	Testing optional, not required.	Testing optional, not required.	Yes, must sample prior to distribution. ²
General Parameters, Table 5	No testing required.	Testing optional, not required.	Testing optional, not required.	Testing optional, not required.	Yes, must sample prior to distribution. ²
Heavy metals, Table 6	No testing required.	No testing required.	No testing required.	No testing required.	Yes, must sample prior to distribution. ²

¹ Phase I windrows will be sampled every 15 days for soybean oil content until oil is no longer detected.

² Once soybean oil is no longer detected, the Facility tests for parameters in Tables 4 to 6 prior to distribution. Once oil is no longer detected and the compost meets the standards in Table 4 for pathogens, and Table 5 for heavy metals, the compost may be considered a compost product and may be distributed.

Table 2. Phase II Sampling and Testing Schedule.

Parameters	Day 1	Day 15	Day 30	Day 45	Prior to Distribution
Oil content, Table 3	No testing required ¹ .	Always must test.	Dependent on Day 15 results. ²	Dependent on Day 30 results. ²	Yes, must sample prior to distribution. ^{2,3}
Pathogens, Table 4	No testing required.	Testing optional, not required.	Testing optional, not required.	Testing optional, not required.	Yes, must sample prior to distribution. ³
General Parameters, Table 5	No testing required.	Testing optional, not required.	Testing optional, not required.	Testing optional, not required.	Yes, must sample prior to distribution. ³
Heavy metals, Table 6	No testing required.	No testing required.	No testing required.	No testing required.	Yes, must sample prior to distribution. ³

¹ The purpose of sampling during Phase I for oil content on Day 1 is to gather baseline data for initial oil content. The Facility is not required to gather baseline data on initial oil content for Phase II windrows.

² Phase II windrows will be sampled every 15 days for soybean oil content until oil is no longer detected.

³ Once soybean oil is no longer detected, the Facility tests for parameters in Tables 4 and 5 prior to distribution. Once oil is no longer detected and the compost meets the standards in Table 4 for pathogens, and Table 5 for heavy metals, the compost may be considered a compost product and may be distributed.

3. Analytical Tests Required.

The Facility shall have the samples collected and tested as specified in Tables 3 to 5 below. The Facility may request Ohio EPA to add or replace the testing methods specified in Tables 3 to 5 below, for methods that are more suitable for verifying the effectiveness of the composting process.

Table 3. Oil content.

Parameter	Analytical method
Soybean oil content	SW-846 9071B

Table 4. Pathogens.

Parameter	Microbial count	Preparation method	Analytical method	TMECC equivalent method
Fecal coliform	Limit of less than 1000 Most Probable Number per gram of total solids (dry weight) (1000 MPN/GTS)	Standard methods part 9221E or part 9222D	Standard methods 9260D/B and either 9222D, 9221E or 9223	TMECC 07.01-B
Salmonella spp.	Limit of less than 3 Most Probable Number per 4 grams of total solids (3MPN/4GTS)	Standard method part 9260B	Standard methods 9260D/B and either 9222D or 9221E, or Neogen Reveal® 2.0 or AOAC 999.09	TMECC 07.02

Table 5. General parameters

Parameter	Analytical method
Maturity	TMECC 05.08-A Specific Oxygen Uptake Rate or TMECC 05.08-B Carbon Dioxide Evolution Rate or TMECC 05.08-C In-situ Oxygen Refresh Rate or TMECC 05.08-D Dewar Self-Heating Test or TMECC 05.08-E Solvita® Maturity Index or TMECC 05.08-F Biologically Available Carbon
pH	TMECC 04.11-A or North central regional (NCR) publication 221 or SW-846 9045D soil pH or ASTM D2976
Salinity	TMECC 04.10 A or NCR publication 221
Total nitrogen	AOAC 968.06 or TMECC 04.02-D or TMECC 04.02-A or AOAC 993.13
Total organic carbon	SW-846 9060 A or TMECC 04.01-A or ASTM D 5373
Total phosphorus	TMECC 04.03-A or Preparation: SW-846 3050B or SW-846 3051A and Analytical: SW-846 6010 or SW-846 6020 or AOAC 985.01 (modified)
Total potassium	TMECC 04.04-A or Preparation: SW-846 3050B or SW-846 3051A and Analytical: SW-846 6010 or SW-846 6020 or SW-846 7000B

Table 6. Heavy Metals

Parameter	Concentration limit mg/kg dry weight	Preparation methods	Analytical methods	TMECC equivalent methods
Arsenic	41	SW-846 3050B or SW-846 3051A	SW-846 6010 or SW-846 6020 or SW-846 7010	TMECC 04.06-As
Boron	Not Applicable	SW-846 3050B or SW-846 3051A	SW-846 6010 or SW-846 6020 or AOAC 957.02 or AOAC 985.01 (modified)	TMECC 04.05-B
Cadmium	35	SW-846 3050B or SW-846 3051A	SW-846 6010 or SW-846 6020 or SW-846 7000B or SW-846 7010	TMECC 04.06-Cd
Copper	1500	SW-846 3050B or SW-846 3051A	SW-846 6010 or SW-846 6020 or SW-846 7000B or SW-846 7010	TMECC 04.06-Cu
Lead	300	SW-846 3050B or SW-846 3051A	SW-846 6010 or SW-846 6020 or SW-846 7000B or SW-846 7010	TMECC 04.06-Pb
Mercury	7.8	SW-846 7471B	SW-846 7471B SW-846 6010 or SW-846 6020 or SW-846 7000B or SW-846 7010 or SW-846 7470A	TMECC 04.06-Hg
Nickel	420	SW-846 3050B or SW-846 3051A	SW-846 6010 or SW-846 6020 or SW-846 7010	TMECC 04.06-Ni
Selenium	100	SW-846 3050B or SW-846 3051A	SW-846 6010 or SW-846 6020	TMECC 04.06-Se
Zinc	2800	SW-846 3050B or SW-846 3051A	SW-846 6020 or SW-846 7000B or SW-846 7010	TMECC 04.06-Zn

4. Distribution.

- a) Tested compost material that does not contain detectable soybean oil and meets pathogen standards in Table 4 shall be considered as compost product and may be distributed as is or in blends.
- b) The Facility may remove material considered as compost product from the pilot project area for further curing or storage in a designated location at the class IV composting facility.
- c) Compost that does not meet the oil content or pathogen testing requirements shall be:
 - i) Remixed with additional feedstock or bulking agents, composted for another 15 days and retested. The process may be repeated until all soybean oil is non-detectable and compost meets the pathogen standards; or
 - ii) Disposed at a licensed solid waste disposal facility, or
 - iii) Used in other legal and authorized applications.
- d) Prior to distribution, if cross-contamination has occurred, the Facility shall resample and analyze the windrow an additional time for oil content and/or pathogen standards prior to distribution. As defined in OAC 3745-560-220(A)(4), cross-contamination has occurred if compost that has been previously sampled and tested is mixed with any amounts of additional feedstocks, bulking agents, additives, or other untested compost.

IX. Background References

1. Cargill. (2014). Safety Data Sheet: Soybean Oil. #5106 version#: 01.
2. OilDri Corporation of America. (2010). Material Safety Data Sheet: PURE-FLO® Perform® 5000 & 5000 CG (#5002850).
3. Loh, S. K., Cheong, K. Y., & Salimon, J. (2017). Surface-active physicochemical characteristics of spent bleaching earth on soil-plant interaction and water-nutrient uptake: A review. *Applied Clay Science*, 140, 59-65.
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X. Test Methods References

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Appendix A
SBE Test Results and Material Safety Data Sheets



Brookside Laboratories, Inc.
Analytical Report

200 White Mountain Drive
New Bremen, OH 45369
Phone: (419) 977-2766
Fax: (419) 977-2767

Client Number: 75475
Client Name: Roe Transportation
Consultant Name: Brookside Consultants of Ohio, Inc.
Date Collected:
Date Received: 01/11/2017

Lab Number: ZE0111021
Location: COMPOST
Description:
Sub Description:

Code	Procedure Name	Prep Method	Analysis Method	Completed Prep	Anal	Analyst	Result	LOQ
IA070	BORON	3050B	6010C	Jan-19	Jan-27	JMO	85.55045 mg/kg	1.523052
IB030	ARSENIC	3050B	6010C	Jan-19	Jan-27	JMO	< 1.5200 mg/kg	1.523051
IB080	CADMIUM	3050B	6010C	Jan-19	Jan-27	JMO	0.733944 mg/kg	0.382282
IB120	COPPER	3050B	6010C	Jan-19	Jan-27	JMO	4.143730 mg/kg	0.764525
IB140	LEAD	3050B	6010C	Jan-19	Jan-27	JMO	3.806727 mg/kg	0.822929
IB172	MERCURY (COMPOST)	3050B	7471B	Jan-19	Jan-23	JMO	< 0.0382 mg/kg	0.038225
IB190	NICKEL	3050B	6010C	Jan-19	Jan-27	JMO	0.633639 mg/kg	0.764525
IB210	SELENIUM	3050B	6010C	Jan-19	Jan-27	JMO	< 2.2935 mg/kg	2.293577
IB300	ZINC	3050B	6010C	Jan-19	Jan-27	JMO	64.32721 mg/kg	2.293577

Approval

Kori Long

Comments:

Kori Long
Environmental Services Coordinator
LOQ - Limit of Quantitation

Name Roe Transportation File 75475
Address 3680 W. Michigan St. Received 09/21/2016
Sidney, OH 45365 Reported 09/23/2016
Submitted by Brookside Consultants of Ohio, Inc.



PHONE (419) 977-2766
FAX (419) 977-2767

FEED ANALYSIS REPORT

Sample Number			13742		
Description of Feedstuff			Spent Clay		
			AS IS BASIS	DRY BASIS	AS IS BASIS DRY BASIS
pH		%	3.59		
Moisture		%	8.40		
Dry Matter		%	91.6		
Fat		%	19.2	21.0	
Crude Protein		%	0.17	0.19	
Digestible Protein		%	0.13	0.14	
Fiber		%	3.48	3.80	
Ash		%	50.3	54.9	
NFE (Crude Carbohydrates)		%	18.3	20.0	
Digestible Carbohydrates		%	15.4	16.8	
TDN		%	48.6	53.1	
ENE	Mcal/100 lbs		39.0	42.6	
NE (Gain)	Mcal/lb		0.16	0.18	
NE (Lactation)	Mcal/lb		0.49	0.54	
Digestible Energy	Mcal/lb		0.97	1.06	
Calcium	Ca	%	0.673	0.735	
Phosphorus	P	%	0.213	0.232	
Potassium	K	%	0.426	0.465	
Magnesium	Mg	%	1.695	1.850	
Sodium	Na	%	0.027	0.029	
Sulfur	S	%			
Iron	Fe	ppm	13648.	14900.	
Manganese	Mn	ppm	153.0	167.0	
Copper	Cu	ppm	7.4	8.1	
Zinc	Zn	ppm	44.3	48.4	
Water-Soluble Nitrogen (NO ₃)		%			
Ammonia (NH ₄)		%			
Neutral Detergent Fiber		%			
Acid Detergent Fiber		%			
Unavailable Crude Protein (ADF-Protein) %					
Relative Feed Value					

2016
Certified
Chemistry
by **NETA**

Approved *[Signature]*

DA: CP: *[Signature]* AN: N/A

BROOKSIDE LABORATORIES, INC.

**** MANURE ANALYSIS REPORT ****

Roe Transportation
3680 W. Michigan St.
Sidney, OH 45365

File Number: 75475
Date Received: 09/21/2016
Date Reported: 09/23/2016

Submitted By: Brookside Consultants of Ohio, Inc.

Lab Number 13743
Description Spent Clay

		% Dry Basis	% Wet Basis	lbs/ Ton
Moisture			8.42	168.40
Mineral Matter		54.94	50.31	1006.2
Lost By Ign (Org M+)		45.06	41.27	825.40
Total Nitrogen		0.04	0.038	0.76
Ammonium-N (NH ₄ -N)			< 0.010	
Nitrate-N (NO ₃ -N)			< 0.010	
Organic-N		0.04	0.038	0.76
Phosphorus (P)		0.23	0.211	4.22
Phos. as (P ₂ O ₅)		0.53	0.485	9.70
Potassium (K)		0.44	0.403	8.06
Potassium as (K ₂ O)		0.53	0.485	9.70
Calcium (Ca)		0.72	0.659	13.18
Magnesium (Mg)		1.80	1.648	32.96
Sodium (Na)		0.03	0.027	0.54
Sulfur (S)		0.86	0.788	15.76
		ppm Dry Basis	ppm Wet Basis	lbs/ Ton
Boron (B)		13.50	12.36	0.025
Iron (Fe)		14900.00	13645.4	27.291
Manganese (Mn)		166.00	152.02	0.304
Copper (Cu)		8.02	7.34	0.015
Zinc (Zn)		48.70	44.60	0.089

Reviewed by





Material Safety Data Sheet

PURE-FLO® Perform® 5000 & 5000 CG (#5002850)

(312)321-1515, Information (800)424-9300, Emergency

1. PRODUCT IDENTIFICATION

MSDS Number: 5002850

Identity: PURE-FLO® Perform® 5000 & 5000 CG

Issued: June 23, 2010

Chemical Name Fullers Earth and/or Bentonite (Montmorillonite type) Clay treated with Sulfuric Acid

2. COMPOSITION

Component	CAS Number	Amount
Fullers Earth and/or Bentonite (Montmorillonite type) Clay	8031-18-3/1302-78-9	85-99%
Quartz	14808-60-7	0-10%
Sulfuric Acid	7664-93-9	<5%

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

This product is a non-combustible mineral. Eye contact may cause irritation. Breathing dust may cause irritation to the eyes, mucous membranes and respiratory tract. This mineral sample contains a small amount of naturally occurring crystalline silica as quartz. Prolonged overexposure to respirable crystalline silica may cause lung disease (silicosis). IARC, in Monograph 68, has concluded that crystalline silica inhaled in the form of quartz from occupational sources is carcinogenic to humans (Group 1); however, carcinogenicity was not detected in all industrial circumstances studied. Because applications and exposure data indicate that exposure to respirable quartz in this product with normal use is well below the OSHA Permissible Exposure Limit (PEL) and ACGIH Threshold Limit Value (TLV); and because the company is not aware of any scientific or medical data available indicating that exposure to dust from this product under conditions of normal use will cause silicosis or cancer; adverse long-term effects would not be expected from normal use of this product.

HEALTH HAZARDS

INGESTION: May cause irritation to the mouth, throat and gastrointestinal tract. May be harmful if swallowed.

INHALATION: Inhalation of dust may cause irritation to the eyes, nose, throat and respiratory tract.

EYE: Contact may cause moderate irritation with possible injury.

SKIN: Contact, especially with moist skin, may be irritating and cause redness and irritation.

SENSITIZATION: No adverse effects expected.

CHRONIC/CARCINOGENICITY:

Inhalation of excessive concentrations of any dust, including this material, may lead to lung injury. This product contains crystalline silica. Excessive inhalation of respirable crystalline silica may cause silicosis, a progressive, disabling and fatal disease of the lung. Symptoms may include cough, shortness of breath, wheezing and reduced pulmonary function. The International Agency for Research on Cancer (IARC), in Monograph 68 has concluded that crystalline silica inhaled in the form of quartz or cristobalite, from occupational sources is carcinogenic to humans (Group 1).



Material Safety Data Sheet

PURE-FLO® Perform® 5000 & 5000 CG (#5002850)

☎ (312)321-1515, Information (800)424-9300, Emergency

However, in making the overall evaluation, the Working Group noted that carcinogenicity was not detected in all industrial circumstances studied. Carcinogenicity may be dependent on inherent characteristics of the crystalline silica or on external factors affecting its biological activity or distribution of its polymorphs. The National Toxicology Program (NTP) classifies crystalline silica as a known carcinogen. Because applications and exposure data indicate that exposure to respirable quartz in this product with normal use is well below the OSHA Permissible Exposure Limit (PEL) and ACGIH Threshold Limit Value (TLV); and because the company is not aware of any scientific or medical data available indicating that exposure to dust from this product under conditions of normal use will cause silicosis or cancer; adverse effects would not be expected from normal use of this product.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:

Individuals with respiratory disorders such as asthma and bronchitis may be at increased risk for respiratory irritation from dust exposure.

4. FIRST AID MEASURES

EYE:	Immediately flush eyes with cool running water, for at least 15 minutes, lifting upper and lower lids. If irritation persists or for foreign body in the eye, get immediate medical attention.
SKIN:	Wash thoroughly with soap and water. Remove contaminated clothing and launder before re-use.
INGESTION:	Rinse mouth out with water and get immediate medical attention.
INHALATION:	Remove to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen. Get immediate medical attention.

5. FIREFIGHTING MEASURES

FLASH POINT: Not Applicable

FLAMMABLE LIMITS Not Applicable

EXTINGUISHING MEDIA:

Use media that is appropriate for surrounding fire.

UNUSUAL FIRE OR EXPLOSION HAZARDS:

None

SPECIAL FIREFIGHTING INSTRUCTIONS

Firefighters should always wear self-contained breathing apparatus and full protective clothing for fires involving chemicals or in confined spaces.

HAZARDOUS COMBUSTION PRODUCTS:

Extremely high temperatures may generate sulfur dioxide.

6. ACCIDENTAL RELEASE MEASURES

Sweep up, taking care not to generate airborne dust and collect for re-use or disposal.

7. HANDLING AND STORAGE



Material Safety Data Sheet

PURE-FLO® Perform® 5000 & 5000 CG (#5002850)

(312)321-1515, Information (800)424-9300, Emergency

HANDLING: Avoid generating airborne dust. Avoid eye and skin contact. Use good housekeeping in storage and use areas to prevent dust accumulation.

STORAGE: Store in a dry area. Keep containers closed when not in use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE GUIDELINES:

Component	Exposure Limit
Fullers Earth and/or Bentonite (Montmorillonite type) Clay	PEL - 15 mg/m ³ TWA (total dust) PEL - 5 mg/m ³ TWA (respirable fraction)
Quartz	PEL - 10 mg/m ³ /%SiO ₂ +2 TWA TLV - 0.025 mg/m ³ TWA
Sulfuric Acid	PEL - 1 mg/m ³ TWA TLV - 0.2 mg/m ³ TWA (thoracic fraction)

PEL- OSHA Permissible Exposure Limit. TLV- American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value. TWA- 8 hour Weighted Average. STEL-Short Term Exposure Limit.

ENGINEERING CONTROLS:

For operations where the exposure limit may be exceeded, local exhaust ventilation is recommended.

RESPIRATORY PROTECTION:

For operations where the exposure limit may be exceeded, a NIOSH/MSHA approved high efficiency particulate respirator is recommended.

SKIN PROTECTION: Impervious gloves such as rubber or neoprene are recommended to avoid prolonged or repeated skin contact.

EYE PROTECTION: Safety glasses or goggles recommended.

OTHER: Appropriate protective clothing recommended when needed to prevent skin contact. An eye wash facility should be available in the work area.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR:

Grey to tan powder, odorless.

PHYSICAL STATE: Solid

BOILING POINT: Not applicable

VAPOR PRESSURE: Not applicable

VAPOR DENSITY: Not applicable

SOLUBILITY IN WATER:

Partially soluble

SPECIFIC GRAVITY: 2.2



Material Safety Data Sheet

PURE-FLO® Perform® 5000 & 5000 CG (#5002850)

☎ (312)321-1515, Information (800)424-9300, Emergency

pH: 2-5
MELTING POINT: Not applicable
OCTANOL/WATER COEFFICIENT:
Not available

10. STABILITY AND REACTIVITY

STABILITY: Stable
INCOMPATIBILITY: Physical contact between this material and turpentine, hydrofluoric acid, vegetable oil or other unsaturated organic compounds (such as fish oil) may generate heat and/or fire. Do not use this material with these compounds without following the disposal considerations in Section 13.

HAZARDOUS DECOMPOSITION PRODUCTS

Extreme heat may generate sulfur dioxide.

HAZARDOUS POLYMERIZATION:

Will not occur.

11. TOXICOLOGICAL INFORMATION

Sulfuric Acid: Oral Rat LD50 2140 mg/kg; Inhalation Rat LC50 320 mg/m3/2 hr

12. ECOLOGICAL INFORMATION

No data available.

13. DISPOSAL CONSIDERATIONS

Unused material is suitable for disposal in sanitary landfill. Without proper precautions, spent bleaching clay used in bleaching fats and edible oils or with other unsaturated organic compounds is known to spontaneously combust. Procedures for handling spent clay follow: Landfills: To suppress spontaneous combustion, heat can be dissipated by spreading out the clay and/or spraying with water. Cover spent clay with non-combustibles. Plant Use: When purging the filter cake of excess oil before cleaning the filter press, excessive blowing with air can cause spontaneous combustion. To eliminate this risk, either use nitrogen or limit blowing with air. When purging the filter cake with steam, it is recommended that you not follow the steam purging with air blowing.

14. TRANSPORT INFORMATION

PROPER SHIPPING NAME:

Not Regulated

UN NUMBER: Not Applicable

HAZARD CLASS/PACKING GROUP:

Not Applicable

LABELS REQUIRED: None

15. REGULATORY INFORMATION

CERCLA/SUPERFUND Spills of this product over the RQ (reportable quantity) must be reported to the National



Material Safety Data Sheet

PURE-FLO® Perform® 5000 & 5000 CG (#5002850)

☎ (312)321-1515, Information (800)424-9300, Emergency

Response Center. The RQ for the product, based on the RQ for Sulfuric Acid (5% maximum) of 1000 lbs, is 20,000 lbs. Many states have more stringent release reporting requirements. Report spills required under federal, state and local regulations.

SARA HAZARD CATEGORY (311/312):

Acute Health and Chronic Health

SARA 313: This product contains Sulfuric Acid (<5%) CAS No. 7664-93-9. Sulfuric acid may be reportable when manufactured, processed or used as an aerosol.

TSCA: All of the components of this product are listed on the EPA TSCA Inventory or exempt from notification requirements.

EINECS: All of the components of this product are listed on the EINECS Inventory or exempt from notification requirements

EEC R&S Phrases: For Perform 5000: R36/38 Irritating to eyes and skin; S24/25 Avoid contact with skin and eyes; S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

For all : Xn Harmful; R48/20 Harmful: Danger of serious damage to health by prolonged exposure through inhalation; S22 Do not breath dust; S38 In case of insufficient ventilation, wear suitable respiratory equipment.

JAPAN MITI: All of the components of this product are existing chemical substances as defined in the Chemical Substances Control Law.

AICS: All of the components of this product are listed on the AICS Inventory or exempt from notification requirements

CANADIAN DSL: All of the components of this product are listed on the Canadian Domestic Substance List or exempt from notification requirements.

CA PROPOSITION 65: This product contains respirable crystalline silica which is known to the State of California to cause cancer.

16. OTHER INFORMATION

NFPA RATING: Health=1 Fire=0 Reactivity=0

HMIS RATING: Health=1* Fire=0 Reactivity=0

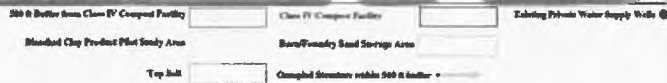
The information in this data sheet is believed to be accurate. However, each purchaser should make its own test to determine the suitability of the product for its purposes. OIL-DRI CORPORATION OF AMERICA MAKES NO WARRANTY, EXPRESSED OR IMPLIED, WITH RESPECT TO THE PRODUCT and assumes no responsibility for any risk or liability arising from the use of the information or the product. Statements about the product should not be construed as recommendations to use the product in infringement of any patent.



Material Safety Data Sheet
PURE-FLO® Perform® 5000 & 5000 CG (#5002850)

☎ (312)321-1515, Information (800)424-9300, Emergency

Appendix B
Facility Plan View Drawing



Roe Transportation Inc. Plan View Drawing
CM010346
3680 State Route 47, Sidney, Ohio

Appendix C
“Field Sampling of Compost Materials”,
Test Methods for the Examination of Composting and Compost

Sample Collection and Laboratory Preparation
Field Sampling of Compost Materials 02.01

Test Method: Selection of Sampling Locations for Windrows and Piles						Units: NA		
Test Method Applications								
Process Management							Product Attributes	
Step 1: Feedstock Recovery	Step 2: Feedstock Preparation	Step 3: Composting	Step 4: Odor Treatment	Step 5: Compost Curing	Step 6: Compost Screening and Refining	Step 7: Compost Storing and Packaging	Safety Standards	Market Attributes
		02.01-B	02.01-B	02.01-B	02.01-B	02.01-B	02.01-B	02.01-B

02.01-B SELECTION OF SAMPLING LOCATIONS FOR WINDROWS AND PILES

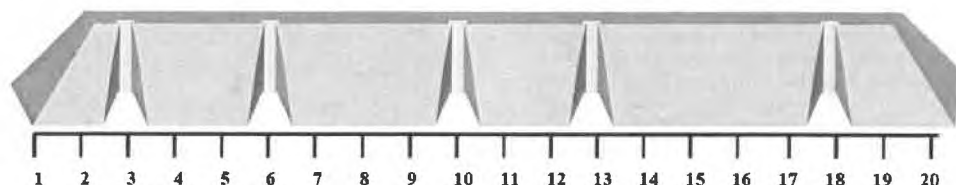


Fig 02.01-B1 Hypothetical sample collection pattern from a compost windrow.

NOTE 1B—In this example, a scale from 1-20 is superimposed on the long dimension of a compost windrow. Five distances (3, 6, 10, 13 and 18 m) are randomly selected to each side of the windrow, (e.g., numbers randomly pulled from a hat), to assign sample collection locations. Point-samples are collected from within three zones at each cutout.

NOTE 2B—The illustrated cut-outs are depicted on one side of the windrow; in a real operation, the cut-outs must be randomly assigned to each side of the windrow. Cone-shaped piles have a circular base. Measure around the base of a cone-shaped pile and randomly assign cutout positions along the pile's meridian, or circumference.

10. Apparatus for Method B

10.1 Sampling Container—five 16- to 20-L (4- to 5-gal), plastic (HDPP), glass.

10.1.1 Organic Contaminant Tests—For samples to be analyzed for the presence of organic contaminants, please refer to Table 02.01-6 Organic Contaminant Tests: Sampling containers and conditions for compost and source ingredient testing. Modify sample packaging steps presented in this section accordingly.

10.2 Sampling Device—silage auger, tilling spade, or other appropriate sampling device.

10.3 Tractor Loader—with loader, (e.g., Bobcat, etc.).

10.4 Trowel—high-density polypropylene (HDPP), for stirring and mixing composite sample.

10.5 Pail—16- to 20-L (4- to 5-gal), square pails. Use standard 5-gal plastic pails for shipping only when square pails are not available (e.g., square pails are available through Cleveland Bottle & Supply Co.; 850 East 77th Street; Cleveland, OH 44103; telephone: 216 881 3330; Fax: 216 881 7325; URL: <http://www.clevelandbottle.com/squrpail.html>).

11. Reagents and Materials for Method B

11.1 Plastic Bags—three 4-L (1 gal) durable bags with seal, (e.g., Ziploc® Freezer bags).

11.2 Plastic Gloves.

11.3 Tarp—clean plastic, canvas, or other type of mixing surface if feedstock is liquid sludge.

11.4 Cold Packs—chemical ice packs, or 4-L plastic bags (e.g., heavy duty Ziploc® freezer bags) filled with approximately 0.5 L of water and frozen flat. One ice pack per 4-L sample container of compost to be shipped, (e.g., three ice packs are recommended for three compost 4-L samples).

11.5 Aluminum Foil—lining for plastic shipping pail, and

11.6 Packing Material—newspaper or other appropriate bulking material to be used as packing or fill to minimize sample movement within the shipping container (square pail) during shipping.

11.7 Adhesive Tape—duct tape, 5-cm (2-in.) width.

12. Procedures for Method B

12.1 Cut into Finished Compost—Using tractor skid-loader, bobcat or shovel, or sample boring device, cut into the finished compost pile or windrow at five or more randomly selected positions. Collect samples from the full profile and breadth of the compost windrow or pile. Refer to Fig 02.01-B1.

12.2 Collect Point-Samples—Samples of equal volume are extracted from the compost pile at three depths or zones measured from the pile's uppermost surface. Collect no less than five point-samples from each of the three depths or zones illustrated in Fig 02.01-B2. The five point samples for each zone must be collected in a manner to accurately represent the horizontal cross-section of the windrow or pile. Use a sanitized sampling tool (a gloved hand, clean shovel or auger) when collecting samples and when transferring samples to the 5-gal sample collection pail.

Sample Collection and Laboratory Preparation
02.01 Field Sampling of Compost Materials

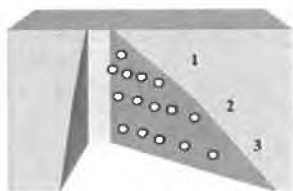


Fig 02.01-B2 Five horizontally dispersed point-samples are collected from each of three depths or zones within each cutout.

NOTE 3B—(1) upper $\frac{1}{3}$ of compost profile height; (2) middle $\frac{1}{3}$ of compost profile height; and (3) lower $\frac{1}{3}$ of compost profile height, where compost pile does not exceed the recommended overall height of 3 m. Create more than three sampling depths or zones within each cutout when the curing pile exceeds a height of 3 m, relative variability is high or the property of interest is found at very low concentrations, near the laboratory detection limit.

12.3 Composite Point-Samples—Place all 15 point samples from one cutout together into one sanitized plastic pail. Completely mix the point samples by stirring thoroughly with a sanitized wooden stick or lath, and by covering and shaking the pail to further mix the samples.

12.3.1 Repeat the blending process at least four times until all point samples are thoroughly blended to form one composite sample that accurately represents the compost for the cutout.

12.3.2 Proceed to the next compost sample cutout and repeat this process to collect one thoroughly blended composite sample from each of the five cutouts.

12.3.3 Composite Sample—Transfer the five composite samples from the sample collection pails onto a mixing tarp or other appropriately sanitized surface or container, such as into a large pail where all samples can be mixed, blended and then covered to minimize moisture loss. Thoroughly blend the five composite samples to form one large sample that represents the average condition of the entire batch or windrow in question.

12.3.3.1 Quarter the composite sample and thoroughly mix and quarter again. Continue to subdivide and split the sample into quarters and mix as described until sample size reaches approximately 12 L (3 gal).

12.4 Stratified Sampling—This sample collection strategy is used to evaluate for the presence of spatial variations or gradients in compost characteristics across and through a windrow or pile.

12.4.1 Stratified Samples across Cutouts—Use this sampling strategy to test for differences in compost characteristics between sample cutouts and along the longer dimension of a windrow. Do not composite materials from the five separate cutouts when

monitoring for the presence of gradients along the longer dimension of a windrow. Pack and prepare five separate samples (i.e., five separate composite samples, one from each cutout) for shipment as described in step 12.5.

12.4.2 Stratified Samples within Cutouts—Use this sampling strategy to evaluate for the presence of spatial variations or gradients that occur with changes in pile depth or distance from the windrow core to its surface.

12.5 Prepare for Shipment and Storage:

12.5.1 Transfer the blended compost to three 4-L (1-gal) sample bags, (e.g., plastic Ziploc® freezer bags).

12.5.2 Line the shipment pail with aluminum foil or other reflective material to minimize sample heat-gain. Place the sample bags containing the compost sample into the plastic pail and interleave with ice packs for shipping (refer to Fig 02.01-B3).

12.5.3 Cover the pail with its lid. Seal and secure the lid with a packing tape. Send the sample pail by one-day express delivery service to your selected laboratory for analysis. Include a chain of custody information sheet with environmental regulatory samples (Refer to Method 02.01-E).

NOTE 3B—Maintain cool samples at 4°C (39.2°F) to diminish microbial and chemical activity prior to and during sample shipment.

Foil lined plastic pail lid

Three 4-L sample containers

Two 4-L ice packs

Foil lined shipping pail

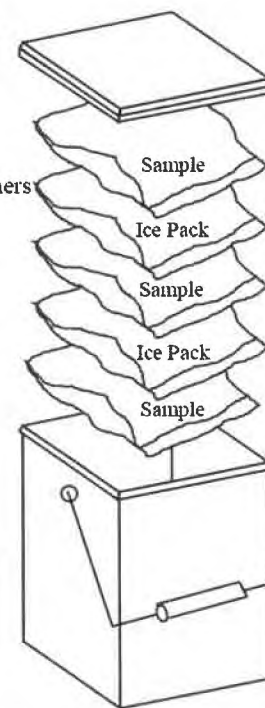


Fig 02.01-B3 Preparation for shipment.