7. B

WELLINGTON VILLAGE COUNCIL
AGENDA ITEM SUMMARY

AGENDA ITEM NAME: ORDINANCE NO. 2012-12 (WELLINGTON'S BEST MANAGEMENT PRACTICES (BMP) PHASE III)

AN ORDINANCE OF WELLINGTON, FLORIDA'S COUNCIL, AMENDING ARTICLE V, "STORMWATER QUALITY MANAGEMENT", OF CHAPTER 30 "ENVIRONMENT" OF WELLINGTON'S CODE OF ORDINANCE, TO PROVIDE ENHANCED STANDARDS FOR BEST MANAGEMENT PRACTICES FOR LIVESTOCK WASTE; PROVIDING DEFINITIONS, ENHANCING THE BEST MANAGEMENT PRACTICES PROGRAM FOR APPLICATION AND STORAGE OF FERTILIZER; PROVIDING FOR ENFORCEMENT; AND PROVIDING AN EFFECTIVE DATE.

ACTION REQUESTED: Discussion ☐ Approval ☒

BUDGET AMENDMENT REQUIRED: Yes ☐ No ☒ See Below ☐

PUBLIC HEARING: Yes ☒ No ☐ **QUASI-JUDICIAL** ☐

FIRST READING ☒

SECOND READING ☐

REQUEST: Adoption following second reading of Ordinance No. 2012-12 amending Wellington's Best Management Practices (BMP's) for Livestock Waste and Fertilizer Management.

EXPLANATION: Wellington's Best Management Practices (BMP's) have been adopted in phases. Phase I, adopted in 2000, implemented standards on the location, type and operation of manure bins, setbacks from storm water management systems, land application of animal wastes, and began regulating the disposal of manure. Those standards were instrumental in reducing the phosphorus loads in Wellington's internal waterways and in our discharges into regulated waterways. Phase II BMP's were adopted in 2004, addressed setbacks and construction and elevation of livestock waste bins. Phase III BMP's are the beginning steps toward meeting the federally mandated standards imposed under the Environmental Protection Agency's "*Numeric Water Quality Standards"* that have been adopted for Florida.

The principal changes and additions to the current livestock waste BMP's are referenced in the Florida Department of Agriculture and Customer Services (FDACS) Manual on Water Quality/Quantity Best Management Practices for Florida Equine Operations 2011 edition adopted in January 2012. This manual references state BMP's which established the standards for water quality in 1999 with the passage of the Florida Watershed Restoration Act. These principal changes and additions include:

- Livestock Waste Storage Areas - These areas will be required to be designed and constructed to be water-tight and covered, such that storm water (rain) will not be allowed to discharge from the area.
- Livestock waste storage facilities - Storage facilities shall also be 50 feet away from any turf grass drainage swale, 100 feet away from any public body of water, public or private drainage conveyances system with direct discharge into a public water body and any drainage inlet.
- A provision has been added to allow the Growth Management Director to establish alternate separation or setback requirements, when compliance with the code standard is not possible because of a property's unusual circumstances or pre-existing conditions not within the control of the owner.
- Spreading of livestock waste - Spreading of untreated manure will not be allowed, however, land application (spreading) of composted livestock waste will be permitted. A permit application for composting mirrors that of the Florida Department of Environmental Protection, but with a focus on the farm owner in Wellington.
- Livestock waste hauling – The hauler will be required to maintain hauling records that:
    - Identify the waste source
    - Document the quantity collected from each individual source
    - Document the quantity deposited (in cubic yards) at an approved disposal site
    - Include signed load tickets or affidavits certifying the loads from both the source and disposal site owners.
- Disposal sites must be certified and meet specific requirements:
    - They must meet the requirements established by the Florida Department of Environmental Protection (DEP) pursuant to Florida Statute 403.707, Chapter 62-709
    - They must maintain records of waste material collected and agree that those records may be audited by Wellington for compliance with disposal standards.

Finally, the BMP ordinance addresses the new County fertilizer provisions providing for:

- Fertilizer applications
- Fertilizer free zones
- Fertilizer content
- Fertilizer application rates
- Management of grass clippings
- Vegetative matter
- Exemptions
- Training
- Licensing of commercial applicators

On April 11, 2012, the Equestrian Preserve Committee recommended unanimously (5-0 with one member declining to vote) to approve Ordinance No. 2012-12.

On May 2, 2012, the Planning Zoning Adjustment Board recommended unanimously (6-0) to approve Ordinance No. 2012-12. The postponement of the first reading of Ordinance 2012-12 to June 12, 2012 was approved on May 22, 2012.

On June 12, 2012, Council recommended unanimously (5-0) to approve Ordinance No. 2012-12 on first reading.

LEGAL SUFFICIENCY: Yes

FISCAL IMPACT: N/A

VILLAGE GOAL: Respecting the Environment

RECOMMENDATION: Adoption following second reading of Ordinance No. 2012-12 amending Wellington's Best Management Practices (BMP's) for Livestock Waste and Fertilizer Management.

ORDINANCE 2012-12

AN ORDINANCE OF WELLINGTON, FLORIDA'S COUNCIL, AMENDING ARTICLE V, "STORMWATER QUALITY MANAGEMENT", OF CHAPTER 30 "ENVIRONMENT" OF WELLINGTON'S CODE OF ORDINANCES, TO PROVIDE ENHANCED STANDARDS FOR BEST MANAGEMENT PRACTICES FOR LIVESTOCK WASTE; PROVIDING DEFINITIONS, ENHANCING THE BEST MANAGEMENT PRACTICES PROGRAM FOR APPLICATION AND STORAGE OF FERTILIZER; PROVIDING FOR ENFORCEMENT; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, the Everglades ecological system is unique in the world and one of Florida's great treasures; and

WHEREAS, the Everglades ecological system not only contributes to South Florida's water supply, flood control, and recreation, but serves as the habitat for diverse species of wildlife and plant life; and

WHEREAS, the Everglades ecological system is endangered as a result of adverse changes in water quality and in the quantity, distribution, and timing of flows, and therefore, must be restored and protected; and

WHEREAS, the Florida Legislature has responded to adverse changes in water quality and in quantity, distribution, and timing of flows that endanger the Everglades ecological system by enacting the Everglades Forever Act; and

WHEREAS, the act authorized the Everglades Construction Project, which is by far the largest environmental cleanup and restoration program of this type ever undertaken; and

WHEREAS, the implementation of the Everglades Forever Act is critical to the conservation and protection of natural resources and improvement of water quality in the Everglades Protection Area and the Everglades Agricultural Area; and

WHEREAS, it has been determined that waters flowing into the Everglades Protection Area contain excessive levels of phosphorus and that a reduction in levels of phosphorus will benefit the ecology of the Everglades Protection Area, which includes the Arthur R. Marshall Loxahatchee National Wildlife Refuge; and

WHEREAS, Wellington is a municipal corporation located adjacent to the Arthur R. Marshall Loxahatchee National Wildlife Refuge; and

WHEREAS, Wellington discharges it's stormwater into the C-51 canal. Stormwater is then typically routed through the Stormwater Treatment Area 1 East (STA

1E), and then into the Arthur R. Marshall Loxahatchee National Wildlife Refuge, which ultimately discharges into the Everglades Protection Area; and

WHEREAS, the State of Florida and Palm Beach County have promulgated recommendations/regulation providing Best Management Practices for application and use of fertilizer; and

WHEREAS, it is the intent of Wellington to pursue comprehensive, aggressive, and innovative solutions to issues of water quality which face the Everglades ecosystem; and

WHEREAS, "Best Management Practices" for livestock waste and fertilizer management are among the best available technology for achieving the interim water quality goals of the Everglades Program and a reasonable method of achieving interim total phosphorus discharge reductions; and

WHEREAS, Wellington entered into a Joint Cooperation Agreement with the South Florida Water Management District on September 26, 2000 pursuant to which Wellington adopted and implemented regulatory measures aimed at lowering phosphorous discharge; and

WHEREAS, those regulatory measures as implemented achieved significant total phosphorus discharge reductions; and

WHEREAS, the previously adopted measures have had an effect on lowering the levels of phosphorous discharge; and

WHEREAS, further measures are needed to continue to reduce the level of phosphorous discharge; and

WHEREAS, Wellington and South Florida Water Management District did enter into a Memorandum of Understanding on or about June 30, 2003 relating to improvement of water resource management facilities in the Basin B area of Wellington; and

WHEREAS, Wellington and South Florida Water Management District did enter into a Cooperative/Cost Share Agreement on or about September 11, 2003, for the implementation of Best Management Practices for livestock waste and fertilizer management to establish improved water resource management facilities in the Basin B area; and

WHEREAS, Wellington and South Florida Water Management District did enter into Memorandum of Understanding No. CP040318 on or about February 10, 2004, concerning the funding of the Acme Basin B Discharge Project; and

WHEREAS, pursuant to the agreements and memorandums of understanding with South Florida Water Management District, it is necessary and advantageous to Wellington to implement a revised third phase of Best Management Practices livestock waste and fertilizer management with enhanced regulations to further the goals of reducing phosphorous levels entering the Everglades; and

WHEREAS, Wellington is engaged in the long-range planning for the equestrian community and is requiring the quantification of horse waste for the purpose of determining environmental impacts to Wellington and the surrounding region; and

WHEREAS, Wellington proposes to monitor the amount of horse waste for a period of 5 years by requiring commercial and self-hauling reports.

NOW, THEREFORE, BE IT ORDAINED BY THE COUNCIL OF WELLINGTON, FLORIDA, THAT:

SECTION 1: Section 30-150, "Definitions" of Article V, "Stormwater Quality Management", of Chapter 30, "Environment" of Wellington's Code of Ordinances is hereby amended as follows:

Section 30-150. - Definitions

The following words, terms, and phrases, when used in this article, shall have the meanings ascribed to them in this section, except where the context indicates a different meaning:

(a) *Application or Apply*: the actual physical deposition of fertilizer to turf or landscape plants in Wellington.

(b) *Applicator:* any person who applies fertilizer on turf and/or landscape plants in Wellington.

(c) Approved Disposal Site: a real property in which a state or county registration or permit has been issued for the disposal and/or processing of livestock waste, as amended from time to time, and/or a plot of land that is conducting bona fide agricultural activities in accordance with Section 193.461,Florida Statutes(F.S).

(d) *Approved Test:* a soil test from a governmental entity or commercial licensed laboratory that regularly performs soil testing and recommendations.

~~(a) *Basin A:* Area north of Pierson Road, however includes Village of Wellington Wastewater Treatment Facility and Village Park property and the areas east of the C-8 Canal north of and including Versailles within the Acme Improvement District. (~~

~~b) *Basin B:* The area south of Pierson Road, excluding Basin A.~~

~~(c)~~(e) *Best Management Practices* or *"BMP":* A practice, or combination of practices, based on research, field-testing, and expert review to be the most effective and practicable, including economic and technological considerations and means of achieving a desired result such as improving water quality in discharges to an acceptable level.

~~(d)~~(f) *Best Management Practices Livestock Waste (Fertilization) Management Plan (BMPLW(F)MP):* A comprehensive waste management plan covering all aspects of managing livestock manure, urine, and bedding waste and/or all aspects of managing fertilizer storage and application developed to prevent the uncontrolled release of pollutants from these wastes.

(g) *Code Compliance Officer:* any designated employee or contractor of Wellington whose duty is to enforce codes and ordinances enacted by Wellington.

(h) *Commercial Fertilizer Applicator* (except as provided in section 482.1562(9), F.S.,): any person or entity who applies fertilizer for payment or other consideration to property.

~~(e)~~(i) *Commercial Livestock Waste Hauler.* person(s), firm(s), corporation(s), or other legal entity(ies) permitted by ~~the village~~ Wellington to provide livestock waste removal services for a fee within ~~the village~~ Wellington in accordance with terms and conditions established by this article.

~~(f)~~(j) *Common Livestock Waste Storage Area:* a livestock waste storage area established for the temporary storage of livestock waste from off-site livestock ~~boarding~~ facilities.

~~(g)~~k) *Composting:* the process by which biological decomposition of organic solid waste is carried out under controlled aerobic conditions, and which stabilizes the organic fraction into a material which can easily and safely be stored, handled, and used in an environmentally acceptable manner for a period of 30 to 90 days.

(l) Cover: the placement of a lid, roof or protective covering over a livestock waste storage area so as to shield the livestock waste from rain / stormwater intake.

~~(h)~~(m) District: The South Florida Water Management District.

~~(a)~~(n) *Drainage Basin ~~A~~:* a topographic region in which all water drains to a common area. ~~Wellington was divided into two basins, A & B. Basin A was the Area north of Pierson Road, however including Village of Wellington Wastewater Treatment Facility, and Village Park property, and the areas north and east of the C-8 Canal north of and including Versailles, all within the Acme Improvement District. (b) *Basin B:* Was noted as an The area south of Pierson Road and, excluding all of Basin A as described herein. These two~~

~~(i)~~(o) *Everglades Protection Area:* water conservation areas 2A, 2B, 3A, and 3B, the Arthur R. Marshall Loxahatchee National Wildlife Refuge (Water Conservation Area 1), and the Everglades National Park.

(p) *Drainage Conveyance Systems*: canals, detention/retention areas, grass swales, underground piping, drainage inlets, junction boxes, manholes are all components that store, collect, and convey rain/surface waters. Specifically above ground ports of entry or near surface components that store or collect rain/surface waters are herein referred to as drainage conveyance systems.

(q) *Fertilizing or Fertilization*: the act of applying fertilizer to turf, specialized turf, or plants.

(r) *Fertilizer*: any substance or mixture of substances that contains one or more recognized plant nutrients and promotes plant growth, or controls soil acidity or alkalinity, or provides other soil enrichment, or provides other corrective measures to the soil.

(s) *Institutional Applicator*: any person other than a private, non-commercial or commercial applicator (unless such definitions also apply under the circumstances), that applies fertilizer for the purpose of maintaining turf and/or landscape plants. Institutional applicators shall include, but shall not be limited to, owners, managers, or employees of public lands, schools, parks, religious institutions, utilities, industrial or business sites and any residential properties maintained in condominium and/or common ownership.

~~(j)~~(t) *Livestock:* all animals of the equine, bovine, or swine class.

~~(k)~~(u) *Livestock facility:* property under single ownership or control where livestock ~~are~~ is raised, boarded, trained, or exhibited.

~~(l)~~(v) *Livestock Waste:* ~~A solid~~ wastes composed of excreta of animals and residual materials that have been used for bedding, sanitary, or feeding purposes for such animals. For purposes of this article, livestock waste that has been properly ~~composed~~ composted shall not be considered livestock waste.

~~(m)~~(w) *Livestock Waste Self-Hauler:* Property owner ~~and/~~or authorized representative registered with ~~the village~~ Wellington to provide livestock waste removal services from their own property in accordance with the terms and conditions established by this article.

~~(n)~~(x) *Livestock Waste Storage Area:* an area constructed of impermeable material such as concrete or asphalt; ~~or an area containing~~ with an impermeable cover; or a mechanical storage container that can be sealed, lifted, and transported.

~~(o)~~(y) *Monitoring Wells:* strategically located wells from which water

samples are drawn for water quality analysis or measurement of ground water levels.

~~(p)~~(z) *Paddock:* a fenced grassed area of ¼ acre or less used primarily for exercise and secondarily for feeding of livestock.

~~(q)~~(aa) *Pasture:* a fenced, grassed area of approximately more than ¼ acre used primarily for exercise and secondarily for feeding of livestock.

(bb) *Prohibited Application Period:* the time period during which a Flood Watch or Warning, a Tropical Storm Watch or Warning, or a Hurricane Watch or Warning is in effect for any portion of Palm Beach County, issued by the National Weather Service, or if heavy rain (2 inches or more within a 24 hour period is likely).

(cc) *Saturated Soil*: a soil in which the voids are filled with water. Saturation soil does not require flow. For the purposes of this Ordinance, soils shall be considered saturated if standing water is present or the pressure of a person standing on the soil causes the release of free water.

(dd) *Slow Release*, *controlled release*, *timed release*, *slowly-available*, or *insoluble nitrogen*: nitrogen in a form which delays its availability for plant uptake and use after application, or which extends its availability to the plant longer than a reference rapid of quick release product.

~~(r)~~(ee) *Soil Test:* an analysis of a site soil sample by a qualified laboratory to determine fertilizer needs of the site, specifically phosphorus needs of the plants grown on the site.

~~(s)~~(ff) *Spreading:* refers to human or mechanical ~~means~~ distribution of composted livestock waste. Animals on pasture shall not be considered spreading of livestock waste. Spreading of unprocessed livestock waste shall not be allowed.

~~(t)~~(gg) *Stormwater Treatment Areas* ~~or~~ *-"STAs":* those water quality treatment and water storage areas know as Stormwater Treatment Area 1 East (STA 1E) as described and depicted in the district's conceptual design document of February 15, 1994, and any modifications thereto.

(hh) *Turf*, *Sod*, *or* L*awn*: an area of grass-covered soil held together by the roots of the grass.

(ii) *Urban Landscape*: pervious areas on residential, commercial, industrial, institutional, highway rights-of-way, or other nonagricultural lands that are planted with turf or horticultural plants. For the purposes of this section, agriculture has the same meaning as provided in Section 570.02 of the Florida Statutes.

SECTION 2: Section 30-151 “Purpose” of Article V, “Stormwater Quality

Management", of Chapter 30, "Environment" of Wellington's Code of Ordinances is hereby amended as follows:

Section 30-151. - Purpose

The purpose of these Best Management Practices (BMPs) for livestock waste and fertilizer management is to comply with Policy 1.2.1~~2~~1 and 13 of the Conservation Element ~~of the Village~~ Wellington's Comprehensive Plan and to comply with the conditions of the Joint Cooperation Agreement between ~~the village~~ Wellington and the South Florida Water Management District which requires ~~the village~~ Wellington to implement a compliance-based pollution prevention program designed to reduce nutrient discharges, specifically phosphorus, from its surface water system into the Everglades Protection Area. ~~The village~~ Wellington is therefore implementing a ~~best management practices (~~BMPs~~)~~ program designed to reduce, abate, and prevent, directly and indirectly, phosphorus discharges to the surface water system within ~~the Village of~~ Wellington.

SECTION 3: Section 30-152 "Applicability" of Article V, "Stormwater Quality Management", of Chapter 30, "Environment" of Wellington's Code of Ordinances is hereby amended as follows:

Sec. 30-152. - Applicability.

These standards shall apply to all property within the boundaries of the Village of Wellington.

SECTION 4: Section 30-153 "Best Management Practices for Livestock Waste" of Article V, "Stormwater Quality Management", of Chapter 30, "Environment" of Wellington's Code of Ordinances is hereby amended as follows:

Sec. 30-153. - Best management practices for livestock waste.

Livestock waste shall be placed, or stored in a livestock waste storage area or water tight container such as a roll-off or dumpster ~~container~~ which is associated with a permit issued by the Village of Wellington. Livestock waste shall not be placed, accepted, stored, or allowed to accumulate on any property in Wellington ~~the village~~, except as provided herein.

(a) *Management of Livestock Waste.*

(1) Each livestock facility shall provide a storage area for livestock waste.

(2) Livestock waste shall be placed, or stored in a livestock waste storage area that meets the following requirements:

a. A livestock waste storage area shall be constructed with an impermeable floor with sidewalls constructed of concrete block, concrete or molded resin based plastic~~, or other approved impermeable material,~~ on three sides. The storage area shall be

designed and constructed to be water-tight with a cover which will not allow storm water discharge. The ~~impermeable~~ floor shall be impermeable and have a curb or rolled lip of asphalt or concrete not less than one inch in height or a slab pitched downward toward the rear wall of the storage area. (Minimum fall from front to rear of two inches)~~.~~; and

b. The livestock waste storage area shall be elevated to a minimum of six inches above the crown of road/access easement; or 12 inches below the residential finish floor whichever is greater;~~ or~~ and

c. A building "permit" or a zoning compliance determination shall be obtained from the Village of Wellington ~~planning, zoning and building department~~ prior to constructing or altering a livestock waste storage area within ~~village~~ Wellington boundaries; ~~or~~ and

d. The determination of the size of the livestock waste storage area is the responsibility of the property owner based upon the number of horses on the property and their daily generation of manure, urine and bedding material as well as intended frequency of removal for disposal. At no time shall livestock waste be allowed to accumulate beyond the threshold of the livestock waste storage area, ~~outside of the confine of the livestock waste storage area;~~ ~~or~~ and

e. Roll-off and dumpster containers may be used as livestock waste storage areas subject to the following requirements:

i. Roll-off and dumpster containers used as livestock waste storage areas shall be placed on a concrete or asphalt pad with at least a two inch curb around the entire storage area; and

ii. Roll-off and dumpster containers used as livestock waste storage areas shall meet the same elevation requirements as in [(2) b].

iii. Roll-off and dumpster containers must be water tight at all times.

(3) ~~Those facilities~~ All equestrian facilities shall ~~with im~~properly store~~d~~ livestock-waste and ~~in existence as of September 26, 2000,~~ shall have livestock waste removed from the facility as provided in this section.

(b) *Location of Waste Storage Facilities.*

(1) Livestock waste storage and roll-off and dumpster containers shall be located:

a. At least five feet away from any adjacent structure roof overhang;

b. At least 50 feet away from any ~~(public)~~ grassed drainage swale ~~conveyance or drainage inlet~~;

c. At least 100 feet away from any drainage port of entry, body of water, public or private storm drainage conveyance system which has direct discharge into any body of water ~~not separated from the public conveyance)~~;

d. At least ~~150~~ 100 feet away from a potable water supply well.

e. Within reasonable proximity to the stable/ barn structure and in accordance with the minimum accessory use set back requirements.

(2) Extenuating circumstances**;** if compliance with the setback regulations is not possible because of properties unusual circumstances, the property owner may submit an alternate method of compliance. Any alternate method of compliance must;

a. Meet the intent of these provisions,

b. Demonstrate the ability to mitigate water quality impacts

c. Provide a secondary method of containment and

d. Be supported by an engineering study.

Mitigation measures such as berms, grading changes or secondary containment systems can be considered in addressing unique and unusual circumstances. If alternative measures are approved they must be installed and maintained in accordance with the approved specifications.

~~Compliance with the setback shall be determined by the village planning, zoning and building department~~.

(c) *Livestock Waste Storage Area Maintenance.*

(1) The removal and transportation of livestock waste on commercial and private properties within ~~village~~ Wellington boundaries shall be done exclusively by either a registered commercial livestock waste hauler or a registered livestock waste self-hauler.

(2) The commercial livestock waste hauler and livestock waste self-hauler shall be registered, as required annually with ~~the village~~ Wellington ~~(environmental engineering/public works department)~~.

(3) Livestock waste shall be confined within the waste storage structure.

(4) Livestock waste storage area(s) shall be continuously maintained so that no stormwater runoff ~~rainfall~~ or any types of liquids/materials are allowed to be released.

(5) All ~~L~~ivestock waste storage areas, containers and pads shall be ~~checked and~~ inspected by a ~~BMP~~ Code Compliance Officer or Building Inspector

~~annually~~ periodically for cracks, crevices~~, and~~ holes, and other damages. Repair shall be made as warranted to prevent spillage or discharge. ~~done in a timely manner. Inspections will be done by a BMP Code Compliance Officer or Building Inspector~~.

~~(6) Roll-off and dumpster containers that are used for storage of livestock waste shall be checked annually for cracks, crevices, holes and/or leaks. Any containers with holes, broken welds or improperly fitting lids shall be repaired or replaced immediately.~~

~~(7) Concrete and asphalt pads used for storing roll-off and dumpster containers which store livestock waste shall be inspected annually for cracks, crevices, holes and/or leaks to prevent soil contamination. The two inch curb and/or rolled lip around the storage area shall be inspected annually. Inspections will be done by a BMP code compliance officer.~~

(~~e~~d) *Composting of Livestock Waste*

(1) The disposal of livestock waste on properties within Wellington must be accomplished by composting the waste or otherwise in accordance with a DEP permit. Composting of livestock waste is permitted under the following conditions within ~~shall be prohibited within the village~~ Wellington's boundaries, ~~except as provided herein~~:

a. Where the composter has received a ~~an approved~~ permit from the Florida Department of Environmental Protection (DEP) pursuant to F.S. § 403.707, and in accordance with ~~Rule~~ Chapter 62-709, Florida Administrative Code. The approved DEP Form ~~#62-701.900(10)~~ shall be submitted to ~~the village~~ Wellington ~~environmental services coordinator~~. A copy of any and all annual reports required to be filed with DEP shall be filed with Wellington annually.

b. Where the composter proposes to spread compost within their property and is not required to obtain a permit from the DEP pursuant to F.S. § 403.707, and in accordance with Chapter 62-709, Florida Administrative Code, the composter shall prepare and submit a permit application to Wellington's Engineer as described in this section. This application entitled: Registration and Annual Reporting for Composting shall be completed and reviewed based on the following standards.

1. Property Information:

a) The number of horses kept within the owner's properties.

b) The amount of livestock waste being generated monthly.

c) The amount of composted waste being generated monthly.

d) Site plan denoting area calculation of available lands i.e. landscape areas, pastures, etc. in which to apply composted manure.

e) Setbacks from wells, drainage inlets and water bodies as referenced in Section 30-135 (b) 1.

f) Soil and composted manure test sample results (UF-IFAS soil testing laboratories).

2. Site plan of property to include:

a) A description of all structures located on property including proposed size, location, use and setbacks (Section 6.10.6 - Development standards, (A) - minimum setbacks).

b) Composting pad location and construction materials.

c) Livestock waste storage facility location and construction materials section 30-135 (a) 2a.

3. Narrative to include: (see Composting Frequently Asked Questions)

a) A brief description of what the projects are designed to do.

b) A description of how odor and vectors will be controlled.

c) A description of the methods used to disinfect the solid waste processed, and the option that will be used to demonstrate that disinfection has been achieved.

d) A description of how stormwater intrusion will be controlled and the type of cover to be provided in the storage structure.

e) The operating parameters to be followed for managing the process.

f) A description of how the facility will be closed.

4. Application:

a) Completed Application for Registration and Annual Composting.

b) $25.00 non-refundable application fee made payable to Wellington.

c) Completed Annual Report for a Solid Waste Management Facility Producing Compost Made from Solid Waste (Part C).

(~~d~~e) ~~*Stable waste*~~ *Compost Spreading Plan*

(1) The spreading of livestock waste shall be prohibited within ~~the village~~ Wellington's boundaries, except as provided herein:

a. ~~A Village of Wellington~~ The property owner must prepare a Best Management Practice Livestock Waste Management Plan (BMPLWMP) ~~shall be prepared~~ in accordance with ~~village~~ Wellington requirements and submitted to ~~the village~~ Wellington's Engineer or designee, who will coordinate with all other departments ~~environmental services coordinator~~ for review and approval. Spreading of composted livestock waste is prohibited without an approved plan. All existing spreading plans shall be required to submit a new BMPLWMP by October 1, 2013 and all BMPLWMP's shall be subject to an annual renewal at which time the property owner shall submit to Wellington an annual report on spreading activates.

b. Livestock waste shall be composted before any spreading occurs.

~~b. Best management practices program livestock waste management plans are available at the public works department.~~

c. Best Management Practices ~~program~~ Livestock Waste Management Plan~~s~~ applications, which ~~that~~ have been approved by ~~the village~~ Wellington, shall be ~~inspected by the environmental services coordinator~~ reviewed annually to ensure practices are being followed as originally submitted and in accordance with the annual report.

(f) *Livestock Waste Hauling.*

(1) All commercial livestock waste haulers and/or livestock waste self-haulers shall be permitted ~~or~~ and registered, as required, annually ~~by the village~~ by Wellington ~~environmental engineering department~~.

(2) Livestock waste may be moved from one livestock facility to another in ~~the village~~ Wellington only for~~.:~~

a. The purpose of composting in an approved composting area; or

b. Storage in a common livestock waste storage area.

(3) All livestock facilities within ~~the village~~ Wellington boundaries shall remove livestock waste by either a commercial livestock waste hauler or a livestock waste self-hauler that is registered by ~~the village~~ Wellington.

(4) Disposal of livestock waste must be within an approved disposal site which is registered to operate under Florida Administrative Code Chapter 62-709.320, additionally the disposal facility must provide copies of all current valid permits annually to Wellington and must agree

to periodic audits and provide copies of all load tickets to Wellington which were obtained from the haulers.

(5) Commercial livestock waste haulers will pay a permit fee to ~~the village~~ Wellington in the amount of $500.00 or as may be adjusted from time to time. Livestock waste self-haulers will not pay a fee.

(6) Commercial livestock waste haulers and livestock waste self-haulers permits and registrations shall be subject to revocation for failure to abide by the terms of this article ~~and the provisions set forth in Florida Administrative Code Chapter 62-709.320~~

(7) Hauling reports shall be provided by commercial livestock waste haulers and livestock self-haulers to Wellington quarterly. Hauling records shall identify the waste source, quantity in cubic yards, and the waste disposal site with quantity deposited in cubic yards within an approved site. Hauling records shall include signed load tickets or affidavits certifying the loads from both the source and disposal site owners. Failure to provide quarterly hauling records may result in the loss of the haulers permit in Wellington. Wellington reserves the right to audit the hauling record and load tickets from the generating properties and disposal sites which have been approved as a disposal site as defined herein.

SECTION 5 Section 30-154 "Best Management Practices for the Application and Storage of Fertilizer" of Article V, "Stormwater Quality Management", of Chapter 30, "Environment" of Wellington's Code of Ordinances is hereby amended as follows:

Sec. 30-154. - Best management practices for the application and storage of fertilizer.

(a) All fertilizers shall be stored in a dry storage area protected from rainfall and ponding.

(b) No fertilizer containing in excess of two percent phosphate/phosphorus (P^2O^5) per guaranteed analysis label (as defined by F.S. Ch. 576) shall be applied to turf grass, pastures, paddocks, or used in nurseries unless justified by a soil test.

(c) Fertilizer containing in excess of two percent phosphate/phosphorus (P^2O^5) per guaranteed analysis label shall not be applied within ten (10) ~~five~~ feet of the edge of water or within ten (10) ~~five~~ feet of a drainage facility.

(d) All fertilizer shall be applied such that spreading of fertilizer on all impervious surfaces is minimized.

(e) Liquid fertilizers containing in excess of two (2) percent phosphate/phosphorus (P^2O^5) per guaranteed analysis label shall not be applied through an irrigation system within ten (10) feet of the edge of water or within ten (10) feet of a drainage facility.

(f) Liquid fertilizers containing in excess of two percent phosphate/phosphorus (P^2O^5) per guaranteed analysis label shall not be applied through high or medium mist application or directed spray application within ten (10) feet of the edge of water or within ten (10) feet of a drainage facility.

(g) ~~The village~~ Wellington shall establish a public education program that is focused on the following: proper irrigation of landscaped areas; application rates of fertilizer; appropriate types of fertilizer for different plants; and proper use of organic fertilizers and soil amendments.

(h) Timing of fertilizer applications.

(1) No applicator shall apply fertilizers containing nitrogen and/or phosphorus to turf and/or landscape during the prohibited application period and within the fertilizer free zones as identified in Section 30-154(i) (1) below or to saturated soils.

(2) Fertilizer containing nitrogen and/or phosphorus shall not be applied before seeding or sodding a site, and shall not be applied for the first thirty (30) days after seeding or sodding, except when hydro-seeding for temporary or permanent erosion control in an emergency situation (wildlife, etc.), or in accordance with the Stormwater Pollution Plan for that site.

(i) Fertilizer free zones.

(1) Fertilizer shall not be applied within ten (10) feet of any pond, stream, lake, canal, water body or wetland as defined by the Florida Department of Environmental Protection (Chapter 62-340), Florida Administrative Code or from the top of a headwall or lake bulkhead. Newly planted turf or landscape plants may be fertilized in its zone only for a sixty (60) day period beginning no sooner than thirty (30) days after planting if needed to allow the plants to become well established. Caution shall be used to prevent direct deposition of nutrients into the water.

(j) Fertilizer content and application rates.

(1) Fertilizers applied to turf within Wellington shall be formulated and applied in accordance with requirements and directions provided by Rule 5E-1.003(2), Florida Administrative Code, Labeling Requirements for Urban Turf Fertilizers. Under Rule 5E-1.003(2), Florida Administrative Code, required application rate and frequency maximums, which vary by plant and turf types, are found on the labeled fertilizer bag or container.

(2) Unless a soil or tissue deficiency has been verified by an approved test, nitrogen or phosphorus fertilizer shall not be applied to turf or landscape plants except as provided in section (1) above for turf, or in UF/IFAS recommendations for landscape plants, vegetable gardens, and fruit trees and shrubs.

(3) Fertilizer used for sports turf at golf courses shall be applied in accordance with the recommendations in "Best Management Practice for the Enhancement of Environmental Quality of Florida Golf Courses", published by the Florida Department of Environmental Protection, dated January 2007. Fertilizer used at parks or athletic fields shall be applied in accordance with Rule 5E-1.003(2), Florida Administrative Code.

(k) Fertilizer Application Practices.

(1) Spreader deflector shields shall be used when fertilizing via rotary (broadcast) spreaders. Deflectors must be positioned such that fertilizer granules are deflected away from all impervious surfaces, fertilizer-free zones and water bodies, including wetlands. Any fertilizer applied, spilled, or deposited, either intentionally or accidentally, on any impervious surface shall be immediately and completely removed to the greatest extent practicable.

(2) Fertilizer released on an impervious surface must be immediately contained and either legally applied to turf or any other legal site, or returned to the original or other appropriate container

(3) In no case shall fertilizer be washed, swept, or blown off impervious surfaces into stormwater drains, ditches, conveyances, or water bodies. Property owners and managers are encouraged to use an Integrated Pest Management (IPM) strategy as currently recommended by the University of Florida Cooperative Extension Service publications.

(l) Management of grass clippings, vegetative matter.

(1) In no case shall grass clippings, vegetative material and/or vegetative debris intentionally be washed , swept, or blown on to or into storm water drains, ditches, conveyances, water bodies, wetlands, sidewalks or roadways. Any material that is inadvertently deposited shall be immediately removed to the maximum extent practicable.

(m) Exemptions.

The provisions set forth above in this ordinance shall not apply to:

(1) Bona fide farm operations as defined in the Florida Right-to-Farm Act, Section 823.14, Florida Statutes (F.S.).

(2) Other properties not subject to or covered under the Florida Right-to-Farm Act that have pastures used for grazing livestock.

(3) Any lands used for bona fide scientific research, including, but not limited to, research on the effects of fertilizer use on urban stormwater, water quality, agronomics, or horticulture.

(n) Training

(1) All Commercial and Institutional Applicators of Fertilizer within Wellington shall abide by and successfully complete the six hour training program in the "Florida-Friendly Best Management Practices for Protection of Water Resources by the Green Industries" offered by the Florida Department of Environmental Protection through the University of Florida/Palm Beach County Cooperative Extension Service "Florida Friendly Landscapes" program or approved equivalent program.

(2) Non-commercial and non-institutional applicators not otherwise required to be certified, such as private citizens on their own residential property, are encouraged to follow the recommendations of the University of Florida/IFAS "Florida Friendly Landscape Program" and label instructions when applying fertilizer.

(o) Licensing of commercial applicators.

(1) All businesses applying fertilizer to turf of landscape plants (including, but not limited to, residential lawns, golf courses, commercial properties, multi-family, equestrian and condominium properties) must ensure that the business owner or his/her designee holds the appropriate "Florida-Friendly Best Management Practices for Protection of Water Resources by the Green Industries" training certificate prior to the business owner obtaining a Local Business Tax Certificate. Owners for any category of occupation which may apply any fertilizer to Turf and/or Landscape Plants shall provide proof of completion of the program to the Wellington. It is the responsibility of the business owner to maintain the "Florida-Friendly Best Management Practices for Protection of Water Resources by the Green Industries" certificate to receive their Business Tax Receipt annually.

(2) After December 31, 2013, all commercial applicators of fertilizer within Wellington, shall have and carry in their possession at all times when applying fertilizer, evidence of certification by the Florida Department of Agriculture and Consumer Services as a Commercial Fertilizer Applicator per Rule 5E-14.117(18) Florida Administrative Code.

(3) All businesses applying fertilizer to turf and/or landscape plants (including, but not limited to, residential lawns, golf courses, commercial properties multi-family, equestrian and condominium properties) must ensure that at least one (1) employee has an appropriate "Florida-friendly Best Management Practices for Protection of Water Resources by the Green Industries" training certificate prior to the business owner obtaining a Business Tax Receipt. Standard Business Tax Receipt (BTR) and transaction fees shall apply.

SECTION 6 Section 30-155 "Commercial Fertilizer Applicators" of Article V, "Stormwater Quality Management", of Chapter 30, "Environment" of Wellington's Code of Ordinances is hereby amended as follows:

Sec. 30-155. - Commercial fertilizer applicators.

(a) Any person, firm, corporation, or other legal entity which provides fertilization services for a fee with a physical address within ~~the village~~ Wellington shall register with ~~the village~~ Wellington ~~on the registration forms provided by the village.~~

(b) Any person, firm, corporation, or other legal entity which provides fertilization services for a fee ~~within the village~~ and whose physical address is outside Wellington shall pay such an annual registration fee of $25.00 or as may be adjusted from time to time. This registration fee may, from time to time, be adjusted by resolution of ~~the village~~ Wellington ~~c~~Council.

(c) Commercial fertilizer registrations shall be subject to revocation for failure to abide by the terms and conditions established in this and other regulations of ~~the village~~ Wellington.

Sec. 30-156. - Enforcement.

Any owner, owner's representative, tenant or person violating any provision of this part may be subject to enforcement as provided in Chapter 2 Article IV, Division 1 and 2 of the Wellington Codes of Ordinances.

SECTION 7: Should any section paragraph, sentence, clause, or phrase of this Ordinance be declared by a court of competent jurisdiction to be invalid, such decision shall not affect the validity of this Ordinance as a whole or any portion or part thereof, other than the part to be declared invalid.

SECTION 8: Should any section, paragraph, sentence, clause, or phrase of any prior Wellington ordinance, resolution, or municipal code provision, then in that event the provisions of this Ordinance shall prevail to the extent of such conflict.

SECTION 9: This Ordinance shall take effect 90 days from date adopted by Wellington's Council.

PASSED this 12th day of June upon first reading.

PASSED AND ADOPTED this _____ day of _____ 2012, on second and final reading.

WELLINGTON

	FOR	**AGAINST**
BY:_____ Bob Margolis, Mayor	_____	_____
_____ Howard K. Coates, Jr., Vice Mayor	_____	_____
_____ Matt Willhite, Councilman	_____	_____
_____ Anne Gerwig, Councilwoman	_____	_____
_____ John Greene, Councilman	_____	_____

ATTEST:

BY: _____
Awilda Rodriguez, Wellington Clerk

APPROVED AS TO FORM AND LEGAL SUFFICIENCY

BY: _____
Jeffrey S. Kurtz, Esq., Attorney for Wellington

Best Management Practices for Livestock Waste and Fertilizer Management
Re-Cap May 2012

When we think of all the benefits of our equestrian amenities and the lifestyle we sometimes overlook the byproducts of this lifestyle. Horse waste is perhaps the most onerous byproduct of the equestrian lifestyle. Conservatively, Wellington's equestrian community produces more than over 50,000 tons of horse manure annually. That's enough manure to be spread one foot thick over 135 acres, little wonder that horse waste is viewed as a "Wellington problem". If you add bedding material to the equation the waste amount could easily double. Still, the horse population in Wellington is only a portion of Palm Beach County's equestrian population. The County's horse distribution extends from Jupiter to Boca Raton, from Greenacres to the Acreage and into the Glades. Regionally, improper disposal of horse waste affects water quality, which in turn affects the groundwater supply, all of which can and does generate real environmental impacts.

<u>So what is Wellington doing about its horse waste?</u>

Wellington has a long agricultural history. Prior to C. Oliver Wellington developing the Flying C.O.W. Ranch in the early 1950s, Wellington was home to a variety of cattle and farming operations. With the establishment of the Acme Improvement District, a series of canals and pump stations drained and irrigated what we know today as Wellington. In the early to 1970s, the urbanization of Wellington began in earnest. At about the same time the State and Federal regulatory climate began to recognize the impacts of development on the environment. A myriad of Federal, State and regional agencies began to develop regulations designed to control impacts of our surface waters and wetlands.

1972 - The Florida legislature enacts Chapter 373 commonly known as the "Florida Model Water Resources Code". This act provided regulatory authority to the five Water Management Districts and to the Florida Department of Environmental Regulation to regulate discharges into Florida's waterways and impacts on wetlands. The basic framework for Wellington's drainage and storm management system was permitted in 1978 under this act.

1994 - The Florida legislature enacted the Everglades Forever Act (EFA) to serve and protect the natural resources of the Everglades Protection Area (EPA). In addition, the act required the reduction of the excessive levels of phosphorus that flow into the Everglades Protection Area.

1998 - The South Florida Water Management District (SFWMD) and The U. S. Department of Environmental Protection (EPA) notify Wellington that phosphorous loads from discharges both into the Arthur R, Marshall Loxahatchee National Wildlife Preserve and into the West Palm Beach Canal exceed allowable limits.

1999 - The Village entered into a cooperative agreement with the South Florida Water Management SFWMD and the EPA to perform water quality monitoring and to identify water quality problem areas.

2000 - Although the extent and exact sources of the phosphorus issues within Wellington have not been determined, livestock waste and fertilizer application were identified as the primary contributors to phosphorus discharge into Wellington's surface water system.

2000 - Wellington adopted its initial Best Management Practices (BMP's) to reduce and prevent phosphorus discharges into the Village's surface water system based on an overall average discharge rate. Additionally, the regulations addressed the storage and disposal of livestock waste.

2004 - The BMP ordinance was updated to address setback requirement along with the construction of the livestock waste bin and a minimum floor elevation.

2008 - Wellington completed the re-plumbing of the Basin "B" storm water drainage system. This was a $10 million effort that included: new storm pump stations, new storm drainage weirs, canal dredging and drainage sumps and most importantly removed discharges into the Loxahatchee National Wildlife Refuge and rerouted them north into the West Palm Beach Canal.

2010 - Wellington completed the re-plumbing of its surface water management system along with the construction of the 365 acre Wellington Environmental Preserve at the Marjory Stoneman Douglas Everglades Habitat (WEP); also known as Section 24, at a cost of $16.5 million.

There has been nearly $40 million invested in improvements designed to reduce Wellington's phosphorus levels from over 200 parts per billion (ppb) to an average of just under 50 ppb which meets our current permit requirements.

2012 – Phase III of the BMP's continues to be a "work in progress". The proposed ordinance (2012–12) provides: additional definitions, language modifications or additions, and addresses the new County fertilizer provisions.

Then additional definitions are:

- Approved Disposal Site
- Approved Test
- Code Compliance Officer
- Commercial Fertilizer Applicator
- Cover
- Fertilizer
- Fertilizing
- Fertilization
- Instructional Applicator
- Prohibited Application Period
- Slow Release
- Sod
- Turf
- Lawn

Modification or additions to the proposed ordinance include:

Livestock Waste Storage Areas - These areas will be required to be designed and constructed to be water-tight and covered, such that storm water (rain) will not be allowed to discharge from the area.

Livestock waste storage facilities - Storage facilities shall also be 50 feet away from any turf grass drainage swale, 100 feet away from any public body of water, and public or private, drainage conveyance system with direct discharge into a public water body, and any drainage inlet.

Growth Management Director - A provision has been added to allow the Growth Management Director to determine compliance with the separation or setback requirements, when the setback regulations are not possible because of a property's unusual circumstances or existing structures.

Spreading of livestock waste - Spreading will not be allowed, however, composted livestock waste will be allowed to be spread. A permit application for composting including a fee mirrors that of the Florida Department of Environmental Protection, but with a focus on the farm owner in Wellington.

Livestock waste hauling – The hauler will be required to maintain hauling records that identify the waste source, documenting the quantity deposited in cubic yards within an approved disposal site. The hauling records must include signed load tickets or affidavits certifying the loads from both the source and disposal site owners.

Disposal sites must be certified and meet specific requirements:

- They must meet the requirements established by the Florida Department of Environmental Protection (DEP) pursuant to Florida Statutes 403.707, Chapter 62-709.
- They must maintain records of waste material collected and agree that those records may be audited by Wellington for compliance with disposal standards

Finally, the BMP ordinance addresses the new County fertilizer provisions providing for:

- Fertilizer applications
- Fertilizer free zones
- Fertilizer content
- Fertilizer application rates
- Management of grass clippings
- Vegetative matter
- Exemptions
- Training
- Licensing of commercial applicators

For over 15 years Wellington has been engaged in developing and improving its "*Best Management Practices*", while at the same time improving storm water protection and enhancing water quality throughout the Village.

It is important to understand that recent court actions resulting from litigation over the "Everglades Forever Act" is that the EPA has enacted Florida specific "Numeric Water Quality Standards" that have a key change to the regulation standard. Total phosphorus load measurement changes from an "AVERAGE" daily load to a "TOTAL MAXIMUM DAILY LOAD" (TMDL). Should the criteria ultimately stand, Wellington could be required to spend an additional 30 to 40 million dollars to go from an "Average" standard to a "TMDL" standard.

Horse Waste Disposal

Varieties of physical disposal methods have been examined and some show future promises, while others such as bio-fuel productions await technological improvements. Some of the current technologies available for producing biofuels actually consume more energy during the production process than the biofuel generate itself. Chemical conversion of horse waste has environmental concerns, while inefficiencies of some processes hinder market acceptance.

Conclusion

Wellington continues to pursue a comprehensive program to address horse waste in our community. With the physical improvements in place, Wellington is looking to the private sector initiatives, and working with neighboring governments in a collaborative effort to educate and enforce regulations to curb illegal dumping. Finally, we will be undertaking an educational program to promote the legitimate licensed haulers and highlight proper disposal. Additionally, the list of licensed hauler will be made available to our residents so they can be sure to use haulers which are complying with our program and disposing of the horse waste at an approved disposal site.

WELLINGTON

Application for Registration and Annual Report for Composting

Checklist

Please be sure to include all the documents along with application. Missing documents could delay approval.

- ☐ Completed Application for Registration and Annual Report for Composting
- ☐ $25.00 non-refundable application fee made payable to Wellington
- ☐ Evidence of permission to operate a solid waste operating facility (including farms, ranchettes, ranches or small properties) at site (if applicable)
- ☐ Narrative to include:
  - o A brief description of what the projects is designed to do.
  - o A description of how odor and vectors will be controlled.
  - o A description of the methods to be used to disinfect the solid waste processed, and the option that will be used to demonstrate that disinfection has been achieved.
  - o A description of how stormwater will be controlled and the type of cover to be provided.
  - o The operating parameters to be followed for managing the process.
  - o A description of how the facility will be closed.
- ☐ Site plan of property to include (See Exhibit A: Compost Spreading Plan Example):
  - o All structures located on property including size, location, use and setbacks.
  - o Composting area including size and setbacks.
  - o Composting pad construction material.
  - o Denote all land areas in which compost materials will be applied.
- ☐ Completed Annual Report for a Solid Waste Management Facility Producing Compost Made from Solid Waste (If applicable)

***The proposed Checklist and Application are being provided as companion documents to Ordinance 2012-12 Best Management Practices for Livestock Waste and Fertilizer Management. These documents are referenced in the proposed revisions of Section 30.153(d) and (e) of Wellington's Code of Ordinances.**

Application for Registration and Annual Reporting for Composting

PART A – GENERAL INFORMATION

1. Type of Application: New____ Renewal (due October 1)____ Annual Report Submission____
2. Type of Facility: Manure Blending____ Vegetative, animal byproducts or manure compost____
3. Type of Waste Processed: Yard Trash____ Manure____ Animal Byproducts____ Pre-Consumer Vegetative____ Vegetative (could/did come into contact with animal product/byproducts____
4. _____ Facility Name: _____
5. _____ Registrant Name (or Permittee if Annual Report Only): _____
6. _____ Address: _____ City: _____ State:_____ Zip:_____
7. _____ Mailing Address (if different):_____ City: _____ State:_____ Zip:_____
8. _____ Facility Property Control Number: _____
9. _____ Contact Person: Telephone Num

PART B – ADDITIONAL INFORMATION REQUIRED FOR REGISTRATION APPLICATION

10. _____ Records will be kept at the facility? Yes No ____

If no, please indicate where these records will be kept and made available upon Wellington's request to review the records:_____

11. _____ Does the registrant own the facility site? Yes____ No ____

Facility Name:_____

Permit Number: _____

If answered no, please attach evidence that the facility owner or operator has permission from the landowner to operate a solid waste organics recycling facility at this site.

12. _____L

andowner (if different then applicant): _____

Mailing Address: _____

City: _____State:_____ Zip:_____

Landowner Contact Person: _____

Email Address: _____Telephone Number: _____

If the landowner is different from the applicant, please attach evidence that the facility owner or operator has permission from the landowner to operate a solid waste organics recycling facility at this site

13. Has the organic recycling facility begun operations? Yes____ No ____

If this facility was operating in the previous fiscal year, the annual report in Part C must be completed.

14. Provide the following information within a narrative and attach to this application:
    a. A brief description of what the projects is designed to do.
    b. A description of how odor and vectors will be controlled.
    c. A description of the methods to be used to disinfect the solid waste processed, and the option that will be used to demonstrate that disinfection has been achieved.
    d. A description of how stormwater will be controlled and the type of cover to be provided.
    e. The operating parameters to be followed for managing the process.
    f. A description of how the facility will be closed.
    g. The soil and compost manure test sample results.
15. On a site plan of the property, include the following (See Exhibit A: Compost Spreading Plan Example):
    a. All structures located on property including size, location, use and setbacks.
    b. Composting area including size and setbacks.
    c. Composting pad construction material.
    d. Denote on the plan all land areas in which compost materials will be applied.
16. Include a check or money order in the amount of $25.00 payable to Wellington for the non-refundable annual registration fee.

I affirm that I have read Section 30.153(d) and (e) of Wellington's Code of Ordinances and shall comply with the requirements specified in those rules. I also affirm that the information provided in the

Facility Name:_____

Permit Number: _____

application is true, accurate, and correct to the best of my knowledge. I have attached all documents and/or authorization that are required.

_____

Print Name and Title of Registrant or Authorized Agent

_____

Signature **Date**

PART C – ANNUAL REPORT (See separate form)

Facility Name:_____

Permit Number: _____

PART D – MAILING/DROP OFF INSTRUCTION

Please include application, all required documentation and a $25.00 annual registration fee and drop off or mail to:

Wellington
12300 Forest Hill Boulevard
Wellington, FL 33414

OFFICE USE ONLY:

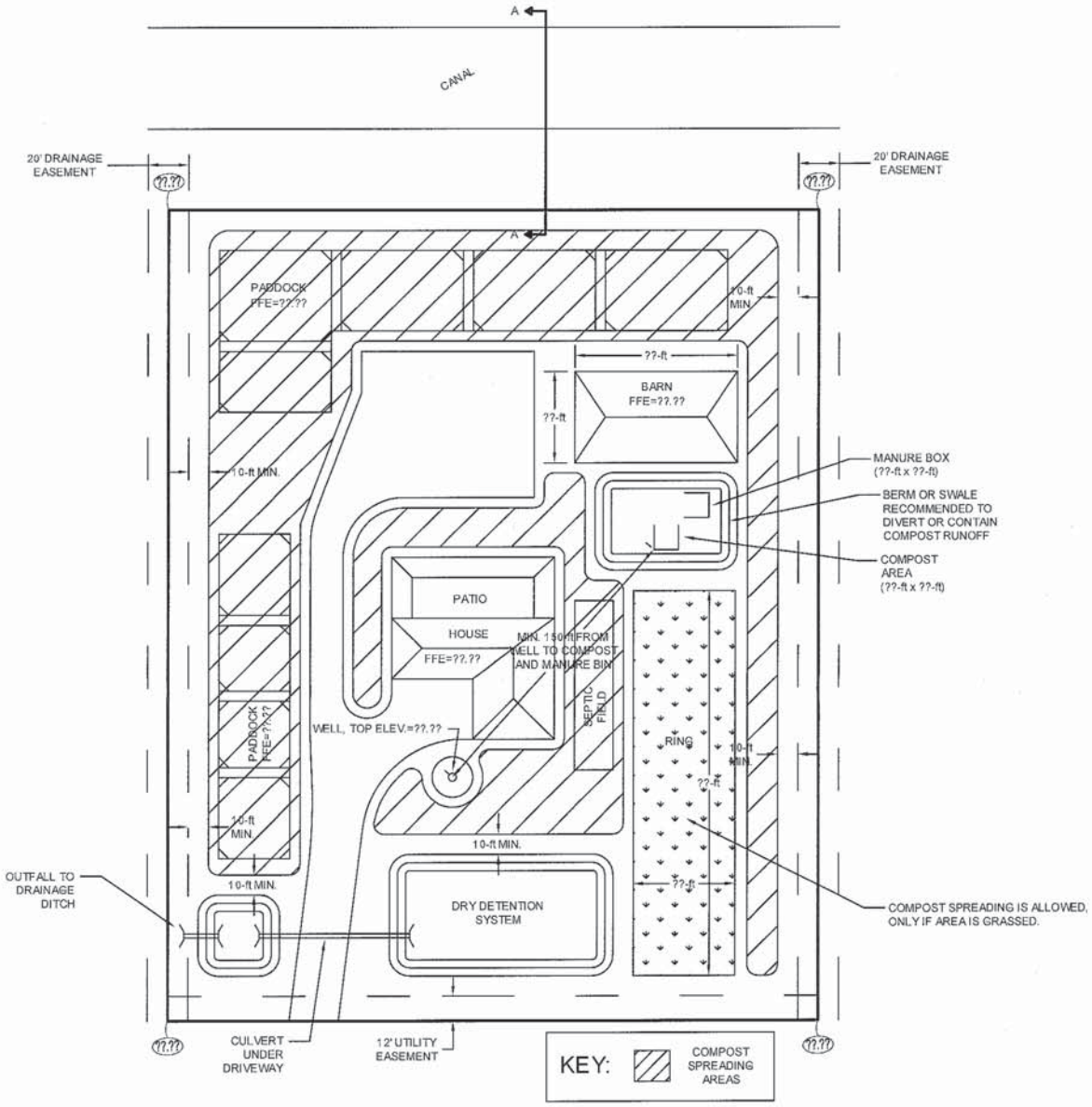
Processed by:_____ Date:_____

Approved by:_____ Date: _____

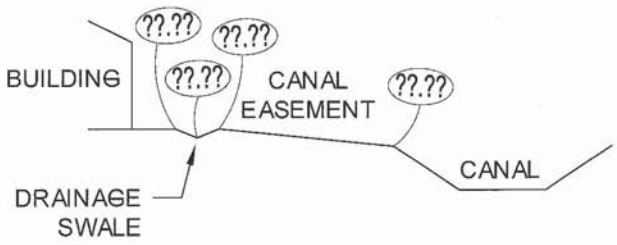
Permit Number:_____

$25.00 Non-Refundable Fee: Cash____ Money Order____ Check____ Check Number_____

EXHIBIT "A"
COMPOST SPREADING PLAN
"EXAMPLE"



CROSS-SECTION A-A



NOTE: ELEVATIONS MUST BE SHOWN AT ALL GRADE CHANGES.

Part C:
Annual Report for a Solid Waste Management Facility Producing Compost Made from Solid Waste

OFFICE USE ONLY:
Processed by:_____Date:_____ Permit Number:_____Approved By:_____

1. _____F
   acility Name: _____
2. _____
   Registrant Name: _____
3. _____A
   ddress: _____
   City: _____State:_____ Zip:_____
4. Mailing
   Address (if different):_____
   City: _____State:_____ Zip:_____
5. _____F
   acility Property Control Number: _____
6. _____Contact Person: Telephone Num
7. _____Year covered by this report:
8. _____Total quantity in tons or cubic yards and type of
   waste on site at the beginning of the report year:
   - Processed _____
   - Unprocessed _____
9. _____Total quantity in tons or cubic yards and type of
   waste received during report year:
   - Yard Trash _____
   - Manure _____
   - Other Solid Wastes _____
   - Sludge (in tons dry weight) _____
   - Other _____

10. Total quantity in tons or cubic yards and type of waste processed into compost during report year

Yard Trash _____

Manure _____

Other Solid Wastes _____

Sludge (in tons dry weight) _____

Other _____

11. Total quantity in tons or cubic yards and type of compost produced during report year. Identify type using classification codes specified in Rule 62-709.550, Florida Administrative Code (F.A.C).

Type:	**Quantity:**
_____	_____
_____	_____
_____	_____

12. Total quantity in tons or cubic yards and type of compost removed from facility for use or disposal during reporting year. Identify type classification codes specified in Rule 62-709-.550, F.A.C. If "used" is circled, include a general description of the market.

Type:	**Quantity:**	**(circle one)**	**Market:**
_____	_____	used/disposed of	_____
_____	_____	used/disposed of	_____
_____	_____	used/disposed of	_____

13. _____ Average number of horses on the property per month:

January _____

February _____

March _____

April _____

May _____

June _____

July _____

August _____

September _____

October _____

November _____

December _____

Note that the sum of items (8) plus (9) must equal the sum of items (10) and (12)

Total of items (8) and (9):_____ Total of items (10) and (12):_____

Person completing this form:_____

Telephone Number: _____ Email Address: _____

I affirm that I have read Section 30.153(d) and (e) of Wellington's Code of Ordinances and shall comply with the requirement specified in those rules. I also affirm that the information provided in the application is true, accurate and correct to the best of my knowledge.

_____

Print Name and Title of Registrant or Authorized Agent

_____

Signature **Date**

Composting Frequently Asked Questions

WHAT IS MANURE COMPOSTING?

Composting may be defined as the controlled breakdown or degradation of organic material (vegetative matter) into a product known as humus. Composting is an excellent way of disposing and recycling horse manure. Composting manure decreases the volume of waste, makes handling waste easier, and will allow the compost to be spread on the owners property. The following sections describe the basic considerations for composting horse manure.

BENEFITS OF MANURE COMPOSTING?

In Wellington, horse owners and managers do not typically have access to crop or garden lands to use the manure. Therefore, composting offers a means of enhancing the material for on-site use while also reducing its volume. While composting takes additional time and expense, it can have a number of advantages depending on the specific needs of the site . Composting of horse manure alone can take 30 to 60 days, while manure with bedding may require as long as 6 months for complete composting.

DOES A MANURE PILE CONSTITUTE COMPOSTING?

No; Composting is a managed process that accelerates decomposition and conversion of organic matter to stable humus. Composting manure is an effective way to transform waste into a valuable resource for pastures, fields, and/or gardens. During the composting process, a large mass of “hungry” microbes break organic materials into smaller physical and chemical particles and build new organic molecules. Composting is both an art and a science. Good composting practice involves maintaining the optimal environmental conditions for microbial growth (water, air, organic matter or carbon, and nitrogen). Merely piling manure for some undetermined time is not composting!

DOES COMPOSTING PROVIDE VALUE?

Yes; Composting can reduce the total volume of manure and bedding generated on your property. Thorough composting will typically reduce the initial volume of material by 40 to 50 percent. Good composting can reduce the risk of manure effecting water quality through:

- *Reduction and elimination* of microbial pathogens;
- *Reduction* of ammonia-N levels;
- *Reduction* in water-soluble phosphorus;
- *Reduction* of water-soluble organic matter (BOD); and
- *Reduction* in total soluble salts.

In a process called aerobic thermophilic composting, microbial activity creates heat that causes the pile to reach temperatures that can kill weed seeds and eliminate pathogens and parasites. Flies are reduced because breeding conditions are eliminated. Composting removes the odor and results in a valuable product that can be utilized to eliminate or reduce the need for chemical fertilizers. The finished compost is a valuable soil amendment, adding nutrients, organic material, and texture to the soil.

DOES COMPOSTING REQUIRE MANAGEMENT?

The basic elements of composting involve maintaining adequate air (oxygen), temperature, and moisture necessary for microbes to flourish. Horse manure and bedding typically contains the correct ratio of carbon to nitrogen necessary for successful composting, although occasionally this may require adjustment. The decomposing manure and bedding in compost is a carbon and nitrogen "convertor" fueled by oxygen, high temperatures, and water. In order to function, a compost pile must have sufficient "breathing" spaces for the microbes and allow the carbon dioxide from their breakdown of organic matter to exit. Moisture is key to maintaining a habitat for large microbe populations. Another challenge is to ensure the proper proportions of the materials in the compost. The type and amount of bedding will substantially affect the ease and rate of composting. Less bedding in the compost results in a faster process and a higher quality final product. Different types of organic materials compost differently. You'll need to customize the process to fit your specific combination of manure, bedding, and other organic materials. You can find the best mixture by developing a clear understanding of the process, accurately measuring materials, and going through some trial and error.

HOW DO I DEAL WITH BEDDING MATERIAL?

Typical bedding materials such as shavings and sawdust can create challenges for composting and the production of a quality finished product. Wood is composed of complex organic compounds rather than simple ones. A compound called lignin is an important component of wood because its chemical structure resists decomposition by many microbes that may flourish in a compost pile. In fact, only a small proportion of microbes (predominantly fungi) can completely decompose lignin to carbon dioxide and water. Therefore, the breakdown of woody material is slow even in the most active composting process. Too much woody bedding will result in a lower quality compost product with a high carbon and nitrogen (C:N) ratio that is less desirable for tilling into the soil. Adding nitrogen to reduce the initial C:N ratio is more cost-effective than adding special microbe inoculants that are on the market and may be necessary in some cases.

In the presence of oxygen, organic material degrades. Approximately two-thirds of the compost piles' initial volume should be free air space. Air space allows oxygen to move into the pile while allowing carbon dioxide and water vapor to leave. Horse manure combined with ample wood shavings or straw is porous and very permeable to gases because of varied particle size. Mixtures of manure and sawdust require a slightly higher degree of management to maintain adequate permeability in the compost bulk. If managed properly, however, sawdust will compost faster than coarser bedding materials. Too little air space reduces the oxygen available to the microorganisms while too much air space dries the pile out and prevents it from reaching temperatures high enough to compost effectively.

Carbon and Nitrogen

Horse manure alone will have close to the optimum proportions of carbon and nitrogen that compost microbes require. Carbon is the major component of organic matter (45-55%) in manure and bedding. A long established "rule of thumb" suggests that a starting carbon-to nitrogen ratio (C:N ratio) of 25 - 35:1 is optimal for composting. Horse manure may range from 25:1 to 50:1. However, with the addition of bedding, particularly that derived from wood, C:N ratios will be higher as the bedding contains much

higher amounts of carbon. Given this reality, manure, hay, and bedding must be relatively fresh for optimal composting so that the microbe-available carbon and nitrogen is high. Alternatively, when bedding such as sawdust, rice hulls, or shavings is used in high proportions, additional nitrogen might need to be added to enhance the decomposition of the woody material. This additional nitrogen might be supplied with fresh grass clippings, hay, or fertilizer.

WHAT IS THE IDEAL TEMPERATURE FOR COMPOSTING?

The highest quality compost is produced at internal compost pile temperatures ranging between 131-150°F (Rynk, 1992). The above factors of air and water have much to do with achieving these temperatures. At these elevated temperatures, microbial pathogens are destroyed and all but the most hardy weed seeds are killed.

IS WATER REQUIRED FOR COMPOSTING?

Yes; Water is required for good composting. Microorganisms grow best with a moisture content of around 50 - 60 percent by weight of the compost pile (Rynk, 1992). If the compost feels like a freshly wrung out sponge, the pile most likely contains the proper amount of moisture. If water runs out of the pile or if you can squeeze water from a handful of compost, it is too wet. Too much water can reduce the supply of oxygen and allow offensive odors to develop. Closely monitor the moisture level, especially during hot, windy days when as much as 5 percent (water equivalent) of the pile's total dry weight can be lost. Adding a little water regularly is much better than letting the pile get dusty and dry, then trying to rewet it back to the 50 percent range.

SHOULD I DO SOME TESTING BEFORE I BUILD A COMPOST?

Yes; Before you build a small or large compost pile, it might be good to do some additional "homework". You may want to test your manure and bedding mixture to get an actual carbon and nitrogen value (see sample and testing section). Even if you choose to use the abovementioned rules of thumb for average C:N ratios, you may find that a direct determination of your mixture's air space and initial water requirements will be helpful. The following method (*from the University of Minnesota Extension Service*) can assist the novice composter in "dialing in" the proper aeration.

Five-Gallon Bucket Test

Materials needed:

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

- Fill the five-gallon pail one-third full with a mixture of typical pre-compost materials. Drop the pail 10 times from a height of six inches onto a concrete floor or solid surface to pack the material. 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 more 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 com post materials or by mixing finer materials into the compost.
- Retest new mix.

DOES THE MANURE BEDDING MIX REQUIRE ADDITIONAL WATER?

Yes; Optimal starting moisture for composting is between 50 and 60 percent. Fresh manure alone will be at the optimal moisture level for decomposition. However, the addition of varying amounts of dry bedding, even with urine, can reduce moisture substantially. Additionally, time spent in a storage area in the middle of the summer can reduce moisture even further. Composting in the wet summer season may require a cover to avoid over saturation. The following is a simple method to determine the moisture in your manure-bedding mix.

Using any reasonably accurate weighing device, weigh out a full 1 or 2 gallon bucket of the mix. Record this as the “fresh” or “wet” weight of the material.

Depending on your preference-tolerance level, select a means to dry this material. Obviously an oven is the best choice (but only the most dedicated will bake a manure cake!). The material could be placed near a hot water heater, in a greenhouse, or anywhere that will assure that the majority of the moisture will evaporate. Re-weigh the material and record this as the dry weight. Calculate the moisture content on a dry weight basis:

$$\frac{(\text{Wet wt.} - \text{Dry wt})}{\text{Dry wt}} \times 100 = \text{Moisture \%}$$

WHAT COMPOST METHOD IS BEST FOR ME?

If you talk to enough experienced composters, you may find that each one adheres to their own “best method”. Composting is both art and science, a balancing act so-to-speak. You will soon discover that the appropriate composting method is determined by the realities and size of your site, the number of horses, the type of equipment and labor you have available, the intended use of the final product, and many other factors specific to your needs or goals. The following section describes some basic composting methods that can be applied to any size project. You will find helpful tips on deciding the appropriate compost method or technology that fits the scale, available equipment, and costs specific to your site.

Aerobic Thermophilic

This is the composting method assumed and described by many technical resources and guides. The approach requires that oxygen availability is managed to provide optimal conditions for predominantly

aerobic (oxygen requiring) microbes. The term thermophilic refers to a group of fungi and bacteria that are so active in breaking down organic matter, that they create significant quantities of heat. These microbes are capable of functioning in temperatures up to approximately 160-165 degrees F. Their oxygen demand is quite high and thus this method requires your manure-bedding mixture to have the optimal physical characteristics that promotes rapid infiltration of oxygen and rapid loss of carbon dioxide.

Aerobic composting methods also require additional management to assure not only adequate oxygen levels, but exposure of all of the composting material to the thermophilic temperatures (>131 degrees F). Therefore additional aeration is often required. This method may utilize your back and shovel or garden fork, a front-end loader, a specialized compost turner, or a system of manifolds, pipes, and blowers (active aeration or aerated static pile method).

The numerous advantages of this method are:

- Most pathogens exposed to thermophilic temperatures for periods of 24 hours to weeks at a time are destroyed;
- Decomposition is rapid and volume reduction occurs quickly;
- And less time and space are required in comparison to slower methods.

Excessive aeration can lead to large losses of nitrogen as ammonia gas and lower product quality. Piles must be built to an appropriate size that retains (insulates) heat, but not so well that temperatures rise so high as to allow for spontaneous combustion. Compost fires can occur when piles or windrows are too large (overly insulated), not aerated frequently, and when moisture levels decline below 35 percent. The aerobic thermophilic method is often the preferred method for producing a safe and valuable compost product capable of a wide range of uses.

Anaerobic Composting

Composting can also be accomplished without efforts to maintain aerobic conditions. In reality, even in an aerobic compost pile, there is a significant amount of anaerobic decomposition occurring. However, the major by-products of completely anaerobic decomposition are different than those produced by aerobic composting. More methane (CH4) is formed than carbon dioxide (CO2) and ammonia levels (inorganic nitrogen) tend to increase in proportion to organic nitrogen forms. A wide range of other occasionally objectionable odors like hydrogen sulfide and other organic compounds are formed.

Nonetheless, anaerobic composting may be attractive in certain situations. The advantages include less time, equipment, and associated costs than with maintaining aerobic conditions. Although the time required to complete anaerobic composting may be longer than the aerobic process. There will be less or no reduction of microbial pathogens, fly breeding, or parasite eggs, and there is a greater potential for odor generation. Space requirements will be greater due to longer composting time and the product may be less acceptable to certain users. For these and other reasons, anaerobic composting is not recommended.

Vermicomposting

This "passive" composting method adds earthworms, or more specifically manure worms, to a manure-bedding mix. Horse manure has been a choice "food" for bait worm producers and the product derived from vermicomposting has advantages over "traditional" aerobic composts.

Vermicomposting allows constant additions of fresh material to the pile or windrow. The process must remain largely aerobic and high temperatures must be avoided. Therefore, piles, windrows, or beds must be small enough to allow any accumulated microbial heat to be lost quickly to maintain a favorable habitat for worms. The worms best suited for this method are manure worms or red wigglers, naturally found in organic matter rather than soil. They reproduce quickly in large numbers and don't mind being "crowded" as long as fresh food, moisture, and oxygen are adequate.

The advantages of vermicomposting include:

- Minimal amounts of equipment are required;
- Aerobic conditions assure limited odors;
- Fresh manure can be added daily, weekly, or monthly;
- Volume reduction may be as high as aerobic thermophilic methods; and
- The final product has a higher fertilizer value and smaller particle size than typical composts, and is very acceptable for a wide number of uses.

Unfortunately, pathogen reduction may be not as great or consistent, space requirements may be excessive, and compost piles or windrows may need to be covered or lined. Initially worms must be purchased. Worms can be quite intolerant of excessive moisture and even noise. Mass migrations out of compost piles occur and the worms are a favorite food of many below- and above-ground predators.

WHAT FACTORS SHOULD I CONSIDER BEFORE COMPOSTING?

You should consider the following factors when determining whether composting is appropriate and what method and technology is right for you:

Size - There must be adequate space available to handle the anticipated volume of manure and bedding while providing equipment access and work space. You should consider accommodating an area large enough for active composting and temporary storage of final compost product.

Permit Requirements - If you have a large operation, you should check with your local enforcement agency (Florida Department of Environmental Protection) or planning department to confirm permit requirements for a compost operation. More than likely you will at least need to submit a manure management plan and keep minimal records (although current State regulations state that more than 500 cubic yards of material on site at one time or more than 1000 cubic yards produced per year will trigger the need to obtain a permit for your composting operation) (CIWMB website). A larger stable will likely already have some type of operating permit that allows for composting as a manure management alternative.

If not, be prepared to educate your local agency and demonstrate that you are aware of and will maintain strict management controls to protect the environment and the interests of your neighbors. California state composting regulations are contained

For operations employing the aerated static pile method, installation of electrical service and equipment may require additional submissions and inspections.

Site Requirements - Your site must not only be sized appropriately, but the operating surface should allow year-round access and minimize the risk of leaching into groundwater. Bare soil is not acceptable. Typically, crushed shell rock surface and concrete or asphalt pads may be required. The site or pad should be on flat ground or a very gentle slope and allow for uniform drainage. Runoff from the site should be contained or conveyed to a settling pond or vegetated filter strip. The site should be a minimum of 50 feet from surface water bodies or drainage inlet. The site should comply with all setbacks and not create "view shed" issues for neighbors and minimize complaints about odor and dust.

Water Supply - Access to water for moisture management and fire safety during the dry season is essential. Water quality should meet the minimum standards for crop irrigation. If you are unsure have your water source tested. *Access to a water supply is critical when locating a compost site.*

HOW DO I DESIGN A COMPOSTING SYSTEM?

There are several ways to design an on-farm composting system and no single one is appropriate for all sizes and types of facilities. However, any system should consist of the following basic components:

- A staging or storage area for raw manure, away from water bodies and drainage inlets;
- A set of bins or free-standing piles large enough to maintain elevated internal temperatures;
- A mechanism for turning the piles or moving the compost from bin to bin, such as hand labor for small operations or a front-end loader for larger areas; or
- A designed active aeration scheme utilizing manifolds and blowers; and
- A water faucet or a pump/water tank combination, and a spray nozzle.

Compost Bins

For small operations, constructed compost bins may be the appropriate approach. A series of bins may be necessary for the one horse operation and can be scaled-upwards (within reason) for operations with less than five horses. Size of the pile does matter. Bins 4' x 4' x 5' tall, constructed from 2" x 6" (treated) boards and heavy-duty posts can be adequate; however, bin design and dimensions will vary with amount manure generated. Bins built on concrete or asphalt with a wooden floor with small spaces between boards that allow air to move from underneath the pile performs best. Each of these bins should easily hold 1.5 tons of horse manure. When aeration is needed, the material is moved from one bin to another. If your horse manure fills up more than six bins of this size or slightly larger, you may want to consider a windrow composting system.

Windrows

For larger operations, a windrow approach will be the most appropriate means to perform aerobic thermophilic composting. Generally, these windrows or piles should be no more than 4 to 6 feet in height and may be of any length that fits with the volume of material generated and the operational preferences of the owner/manager. Windrows and large piles require equipment capable of moving larger quantities of materials. Many stable operations will already have a front-end loader.

HOW DO I MANAGE THE COMPOST PROCESS?

The critical operational requirements are related to aeration, moisture management, and process monitoring.

Aeration

If you choose to employ an aerated static pile system, you will likely need to refer to established engineering and design criteria. At worst, you may need to hire a mechanical engineer to properly size the system. This is critical to be assured that your active system distributes air evenly throughout the entire composting mass and does not introduce too little air (increased anaerobic locations) or excessive quantities of air while removing too much internal heat, or forcing ammonia from the pile.

When utilizing the turned aerobic method, establish a desired turning frequency of 2 weeks, 3 weeks, or monthly. However, if your operation is large enough to require a permit, you will need to establish a turning frequency in accordance with established pathogen-reduction procedures (Florida Department of Environmental Protection website). Consulting other folks' "rules of thumbs" may get confusing. Remember that composting can often be very site specific. Be prepared to observe and adjust turning frequency as needed. Ultimately this requires time and cost, so you should strike a compromise between an optimal aeration frequency and the other tasks and labor required at your site. However, you should recognize that there may be times (e.g., following heavy rainfall) when you may need to aerate, regardless of your schedule. Supports should be buried for stability.

Turning of compost, whether by back and shovel or mechanical loader, should be done in a manner that allows as much air to be introduced to the material as possible. Realize that you are also attempting to release trapped carbon dioxide and reduce compaction at the same time. Therefore, be certain to allow material to "fall" from your shovel or bucket to expose as much surface area as possible. With a loader, drop the material into the bin or new windrow from the maximum bucket height. With a shovel, give it a good toss.

Moisture Management

The moisture content of the manure and bedding might be adequate in the fresh state, so additional moisture might be unnecessary until the compost is moved or turned. However it may be necessary to add water to the material prior to loading it into a bin or building a pile or windrow. During the dry season, particularly mid- to late winter, have an ample water supply and pressure to "irrigate" the compost as it is turned or moved to another bin. Moisture content can drop as low as 25 percent within 4 weeks of active thermophilic decomposition. To increase the moisture content of compost from 25

percent to 55 percent, add about 20 to 30 gallons of water per 100 cubic feet of compost. For a system in which four bins (1,000 cubic feet each) require additional moisture, approximately 1,200 gallons of water may be needed every time the bins are turned. However, the actual amount of water needed will vary substantially depending on the kind of bedding used, the size of the particles in the bedding, and other site specific factors.

Don't try to add all the water at once. Instead, use a spray nozzle to deliver the water to the compost as each loader bucket is turned into the bin or new pile. It is easy to verify the proper moisture content. Grab a handful of compost that has been mixed well and squeeze the compost tightly in your fist. You should not be able to squeeze any free water droplets out of the compost, but it should leave your hand slightly wet. If you inadvertently get the compost too wet, don't panic; just keep an eye on the compost temperatures in that bin and turn the compost if temperatures do not rise in a couple of days. If rank odors emanate from any of the bins, the moisture content is probably too high. Turning the compost will help drive off some moisture, while increasing oxygen and alleviating the problem.

HOW DO I MONITOR COMPOST TEMPERATURE?

Checking compost temperature is the easiest and quickest way to keep track of a composting system. Typically, fresh materials will heat up within 24 hours and within 2 to 3 days of correct construction internal temperatures may reach 155 degrees F. A simple long-stemmed thermometer (or two) and some good record-keeping skills are all that are needed. At a point perhaps two feet down from the top of your pile or bin, carefully insert the thermometer halfway into the side of the composting mass and allow the needle or digital display to stabilize. Record the date, time, bin or pile number, location within the bin (e.g., center, northwest corner, etc.) and temperature. Take *Temperatures should be recorded from a number of locations within the compost pile* temperatures at several locations to average out any odd readings. Sometimes a thermometer will be inserted directly into a cold or wet spot that is not visible from the outside and is not characteristic of the windrow or bin as a whole.

When you are just getting started, measure temperatures at least daily for the first week after the compost pile or windrow is constructed. Then, if temperatures are in the thermophilic range (between 131 degrees and 160 degrees F), the time between measurements may be increased. Twice-weekly intervals are probably appropriate. Declining temperatures early in the composting period likely indicate declining oxygen levels, less than optimal moisture content, or in the worst case inadequate available nitrogen for the microbes. Temperatures immediately after turning and wetting may drop to near air temperature, but they should rebound markedly within 48 hours. The thermophilic stage of decomposition may last for 2 to 6 weeks depending on the starting C:N ratio. Manure containing the proper balance of shavings or sawdust tends to maintain thermophilic temperatures longer than manure alone or with low volumes of bedding, whereas manure with too much bedding can cause temperatures to drop. Keep the temperature data in a handy file to help document to your local enforcement agency and prospective buyers that weed seeds and pathogens will not be a problem in your compost.

WHEN IS THAT COMPOST DONE?

Typically, when utilizing the aerobic thermophilic composting method, temperature is a key indicator of progress towards finished compost. A standard rule of thumb suggests that compost is finished when there is only a 15 to 20 degree difference between internal pile temperature and the air temperature in the middle of the day. Generally, aerobic composting has three distinct phases: the active, high decomposition phase (thermophilic, 2 to 6 weeks); a slower decomposition phase, (mesophilic, 3 - 12 weeks) carried out by different microbes; and then a curing or finishing stage (4 - 8 weeks), where subtle changes in the biology and chemistry of the compost occur. This last phase creates "mature" compost.

Mature compost is that granular, dark brown, earth-smelling material that we associate with potting soil or other "out-of-the-bag" soil mixes. While there are commercial test kits and laboratory services available, common sense can also be your guide in determining if your compost is finished.

SUMMARY

You've made it through this lesson in composting. Should you wish to learn more, there are numerous articles, books and websites dedicated to composting. Below are some rules to consider and "live by" before and after you become a composter.

- If you manage a larger facility, be prepared to spend some time educating your staff about your goals for manure management with composting.
- Prepare your site to ensure the compost area drains well. Ponded water, especially around manure and compost, will cause odor and fly problems. A small box blade or the back of your loader will help keep the area smooth and well drained.
- Collect manure from the paddocks and stalls carefully. Try to keep mineral soil out of the manure, and keep track of how many wheelbarrow loads are delivered to your system every day. Try to limit the amount of woody bedding materials that end up mixed with manure. *Trucking is the major cost in manure management.*
- Try to ensure good drainage from any outdoor horse paddocks from which manure is collected. Muddy conditions give you soil-laden manure, reducing the organic matter content per unit of compost. Instruct employees to keep garbage, plastics, carcasses, and animal health products (syringes, vials etc.) out of the compost piles.
- Make provisions for adding supplemental water when needed. Shaping the tops of the piles to capture irrigation or rainfall may be helpful.
- Monitor compost temperatures every few days initially and at least weekly. Temperature alone will not tell the full story, but it can be an indicator of success or of imminent problems.
- Keep the composting area clean and well maintained. If you have a boarding or training operation, a good image is vital to ensuring your clients' cooperation and for compost marketing success.
- Use the finished product in your own farm properly – as soil amendments, landscape bed and gardening.
- Have laboratory analysis performed on compost samples from time to time. Knowing your product will reassure your composting methods is working. A routine analysis will include

nitrogen, phosphorus, potassium, sulfur, and total salinity. Organic matter analysis adds significantly to the cost, but it will help you determine if manure-harvesting methods are picking up too much mineral soil, which reduces compost quality. If interested in using compost as a bedding material, periodic analysis for pathogens is good insurance.

- Compost has a value; carefully consider what makes sense to and your facility.

GLOSSARY

aerobic – an organism or process requiring air (sic. oxygen)

aeration – to expose or supply with air

anaerobic – an organism or process that does not require oxygen

bedding manure – a mix of manure and bedding material

biofilter – a system that uses soil, organic materials, or living plants to trap unwanted gases, particulate matter or chemicals

buffer – any structure, distance, or planting that shields or protects another from danger, loss, or contamination

composted manure – manure that has gone through the composting process

containment area – a basin or other landscape feature designed to contain leachate or runoff from compost or manure handling areas

filter strip – typically an intentionally planted buffer area (grasses most often) that provides a trap for particulate matter and nutrients for runoff waters

fresh manure – manure that has been excreted from the horse within the previous 48 hours

grassed waterway – a vegetated drainage channel designed to safely carry water and trap sediment and nutrients

leachate – water passing through and out of soil or manure that contains dissolved nutrients and organic matter from the material

microbes – a microorganism (eg., bacteria, fungi, algae)

micronutrient – an element or compound required in only small amounts by animals and plants

pathogens – any disease-causing organism

pathogenic – disease-producing

riparian area – pertaining to the bank area adjacent to a creek, stream, or river

stored manure – manure that has been removed from stalls or paddocks and piled in preparation for further processing or disposal.

RCD – Resource Conservation District, a non-profit community organization organized as a Special District under California law (Division 9,Public Resource Code) that provides technical assistance for protection and conservation of natural resources

NRCS – National Resources Conservation Service, a branch of the United States Department of Agriculture (USDA) and formerly the Soil Conservation Service

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