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Final Cost-Benefit and Least Burdensome Alternative Analyses

Chapter 173-350 WAC
Solid Waste Handling Standards

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Chapter 173-350 WAC
Solid Waste Handling Standards

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Executive Summary

This report reviews the economic analyses performed by the Washington State Department of Ecology (Ecology) to estimate the incremental expected benefits and costs of the adopted amendments to the Solid Waste Handling Standards rule (Chapter 173-350 WAC) and determination of its degree of burden.

The Washington Administrative Procedure Act (APA; RCW 34.05.328) requires Ecology to evaluate significant legislative rules to "[d]etermine that the probable benefits of the rule are greater than its probable costs taking into account both the qualitative and quantitative benefits and costs and the specific directives of the law being implemented."

Authorized by chapter 70.95 RCW (Solid waste management – reduction and recycling), the adopted rule amendments:

- Add an anaerobic digester exemption from RCW 70.95.330 and a new section (WAC 173-350-250) for anaerobic digester facilities that do not meet the exemption.
- Address the regulation of composting within Ecology's delegated solid waste management, reduction and recycling authority.
- Clarify previously existing rule language, process and control requirements, permitting exemptions, and definitions.
- Ensure consistency with other compost-related rules, laws, and policy decisions.
- Address other issues such as definitions of feedstock types related to WAC 173-350-220, Composting Facilities.

The adopted rule amendments are necessary to:

- Be consistent with current law regarding anaerobic digesters.
- Maintain strong environmental and human-health standards while expanding organics recycling.
- Respond to public concerns regarding impacts (primarily odors) of composting facilities.
- Respond to business and public concerns regarding compost products.

Ecology estimated the following costs associated with the adopted rule amendments. These costs are in present-value terms, over 20 years.

Table 1: Executive Summary of the Costs of the Adopted Rule Amendments

COMPOSTER COSTS	Low	High
Fees to update plans	$0	$37,185
Update plans for group 5 composters	$2,293	$10,941
Supervisor training	$191,953	$191,953
Odor plan	$23,607	$112,644
Closure plan	$590	$2,815
ANAEROBIC DIGESTER COSTS	**Low**	**High**
Operating report	$11,720	$55,924
Closure plan	$146	$697
TOTAL 20-YEAR COSTS	**$230,309**	**$412,159**

The total quantifiable present-value costs of the adopted rule amendments are approximately $230,309 – $412,159. Where prices, number of applicable facilities, or timing were uncertain, Ecology made assumptions that would overestimate costs, as to conservatively underestimate net benefits of the adopted rule amendments. Ecology received comments suggesting additional cost estimation, but did not determine additional costs were appropriate. Please see the associated Responsiveness Summary for this rulemaking.

Ecology estimated the following benefits associated with the adopted rule amendments. These benefits are in present value terms, over 20 years.

Table 2: Executive Summary of Benefits of the Adopted Rule Amendments

GENERAL BENEFITS
Facilitating compliance through organization and clarity.
Reducing or preventing nuisance odors to the public, and reducing property value impacts associated with odors. Odors affecting residential properties can reduce property values by at least 3.4 percent.
Providing opportunities for small composters, digesters, and agricultural operations to operate under permit exemption.
BENEFITS OF AMENDED COMPOSTER REGULATION
Reduced risk of improperly left-behind compost materials that may create nuisance odors. Reduced risks to buyers and sellers of real estate.
New permit exemptions for: • Existing composters. • One new exempt facility per year required to report to Ecology. • Numerous small composters not required to interact with Ecology. Resulting in avoided permit costs of **at least $398,924, plus avoided compliance costs**, and ability to expand operations: • New permit exemption for small compost facilities. • New permit exemption for facilities composting post-consumer food waste, pre-consumer vegetative waste, pre-consumer animal-based waste, yard debris, bulking agents, and manufactured organics. • New permit exemption for facilities composting yard debris, crop residues, manure and bedding, and bulking agents. • New permit exemption for facilities composting yard debris and bulking agents. • New permit exemption for facilities composting agricultural wastes and bulking agents.
Public health and environmental protection from notification to regulators.
More accurate reporting.
Better construction through specifications for quality assurance for facility construction.
Reduced risk to public and environmental health, and air and water quality issues that affect public wellbeing, through trained supervisors and employees.
Better planning, analysis, and reporting based on representative pile temperatures.
Increased odor control for neighboring populations.

Reduced risk to public and environmental health from molybdenum and selenium.	
Better planning, analysis, and reporting based on representative compost sampling.	
Facilitating compliance and flexible business practices, through establishing uniform standards for testing frequency.	
Reduced physical contamination of compost products. Improved usability of compost by end-users. Reduced maintenance costs for end-users of compost. Improved public relations and long-run business support for compost producers and users.	
Additional information for end-users to select compost, and composters to identify desired qualities of end-user demand.	
Ability to refer to an on-site operating plan as needed.	
Reduced nuisance odors, dust, and other environmental impacts on neighboring populations. Reduced quality-of-life and environmental justice concerns. Improved public relations for composters.	
Improved planning including composting materials handling at the largest capacities.	
Increased accuracy and appropriate operations, planning, and reporting from representative sampling plans.	
Encouragement and availability of appropriate levels of regulatory oversight for construction records.	
BENEFITS OF AMENDED OTHER FORMS OF ORGANICMATERIALS HANDLING	
New permit exemption for vermicomposters composting food waste as a feedstock.	
Allowance for vermicomposting exemption for processing up to 1,000 yards.	
New category of exemption for other organic material handling activities up to 50,000 gallons of liquid wastes, or 250 cubic yards of non-liquid organic feedstocks, and exemption of operations below 5,000 gallons (or 25 cubic yards) from notification, reporting, or testing requirements.	
BENEFITS OF AMENDED ANAEROBIC DIGESTER REGULATION	
New permit exemption for facilities digesting all organic feedstocks. Resulting in avoided permit costs of **at least $299,193 plus avoided compliance costs.**	
Improved internal knowledge of digester facilities through reports, plans, and specifications for new facilities. Reduced risk to public health and the environment through reduced likelihood of operations beginning at insufficient digester facilities.	
Reduced risk of environmental contamination, and air or water quality issues that affect public wellbeing, through trained supervisors and employees.	
Improved operational planning and preparedness on site at digester facilities. Ability to refer to an on-site plan for reference in operations.	
Improved digester facility closure plans, reducing risk to the public and environment, of contamination, odors, and other dangers and nuisances coming from improperly closed digester facilities.	
TOTAL QUANTIFIABLE BENEFITS (excludes avoided compliance costs and qualitative benefits above)	**$698,117**

Based on qualitative and quantitative assessment of the likely costs and benefits of the adopted rule amendments, Ecology concludes that there is reasonable likelihood that estimated benefits of the adopted rule amendments exceed their costs.

Ecology assessed alternatives to the adopted rule amendments over the course of the rulemaking, and determined whether they met the general goals and specific objectives of the authorizing statute. Of those that would meet these objectives, Ecology determined whether the adopted rule amendments were the least burdensome.

The authorizing statute is chapter 70.95 RCW. The goals of this statute, as they pertain to the rulemaking include:

- Encouraging composting and anaerobic digesters.
- Protecting public health and the environment.
- Encouraging safe and effective use of compost and digestate.

Ecology concluded that the adopted rule amendments are the least burdensome alternatives that meet these goals and objectives.

Chapter 1: Background and Introduction

1.1 Introduction

This report reviews the economic analyses performed by the Washington State Department of Ecology (Ecology) to estimate the incremental expected benefits and costs of the adopted amendments to the Solid Waste Handling Standards rule (Chapter 173-350 WAC) and determination of its degree of burden.

The Washington Administrative Procedure Act (APA; RCW 34.05.328) requires Ecology to evaluate significant legislative rules to "[d]etermine that the probable benefits of the rule are greater than its probable costs taking into account both the qualitative and quantitative benefits and costs and the specific directives of the law being implemented."

1.2 Description of the adopted rule amendments

Authorized by chapter 70.95 RCW (Solid waste management – reduction and recycling), the adopted rule amendments:

- Add an anaerobic digester exemption from RCW 70.95.330 and a new section (WAC 173-350-250) for anaerobic digester facilities that do not meet the exemption.
- Address the regulation of composting within Ecology's delegated solid waste management, reduction and recycling authority.
- Clarify previously existing rule language, process and control requirements, permitting exemptions, and definitions.
- Ensure consistency with related rules, laws, and policy decisions.
- Address other issues such as definitions of feedstock types related to WAC 173-350-220, Composting Facilities.

1.3 Reasons for the adopted rule amendments

The adopted rule amendments are necessary to:

- Be consistent with current state law regarding anaerobic digesters.
- Maintain strong environmental and human-health standards while expanding organics recycling.
- Respond to public concerns regarding impacts, particularly odors, from composting facilities.
- Respond to business and public concerns regarding compost products.

1.4 Document organization

Ecology organized this document into the following sections:

- Baseline and adopted rule amendments (Chapter 2): Description and comparison of the baseline requirements in state and federal laws and rules to the adopted rule amendments.
- Likely costs of the adopted rule amendments (Chapter 3): Analysis of the types and size of costs Ecology expects impacted facilities to incur.

- Likely benefits of the adopted rule amendments (Chapter 4): Analysis of the types and size of benefits expected to result from the adopted rule amendments.
- Cost-benefit comparison and conclusions (Chapter 5): Discussion of the complete implications of the Cost-Benefit Analysis. Comments on the conclusion.
- Least Burdensome Alternative Analysis (Chapter 6): Analysis of considered alternatives to the final adopted rule amendments.

Chapter 2: Baseline and Adopted Rule Amendments

2.1 Introduction

In this chapter, Ecology describes the baseline to which the adopted rule amendments are compared. The baseline is the regulatory context in the absence of the amendments being adopted.

In this chapter, Ecology also describes the adopted rule amendments, and identifies which require analysis under the APA. Here, Ecology addresses complexities in the scope of analysis and indicates which costs and benefits are discussed in chapters 3 and 4 of this document.

2.2 Baseline

In most cases, the regulatory baseline is the previously existing rule. In this case of adopted amendments to chapter 173-350 WAC, the regulatory baseline includes:

- The previously existing Solid Waste Handling Standards rule.
- New exemptions and requirements in the authorizing statute (RCW 70.95.330).
- Existing statutes and rules regulating water pollution, air pollution, and biosolids handling.

Ecology analyzed the elements of the adopted rule that were different than the previously existing rule, but were not specifically required by the authorizing statute or other regulations.

2.3 Analyzed changes

For all of the adopted changes to the rule, Ecology determined whether the amendment must be analyzed. Ecology analyzed the following requirements, which are both:

- Amendments to the rule language that change applicable facility requirements.
- A result of Ecology's discretion (not dictated in other laws or rules).

(Analyses are presented in chapters 3 and 4 of this document.)

2.3.1 General changes

- Update the schedule for compliance with the revised rule from the previous 2003 rule adoption.
- Update the definition of agricultural wastes.
- Redefine wastes in terms of specific types, rather than the four groups under the baseline. This change has no impact on its own.
- Require feedstocks not specifically addressed in exemptions in the rule to be approved by Ecology or the jurisdictional health department.

- Require plan updates as discussed in specific subsections below. This includes necessary jurisdictional health department review and fees.

2.3.2 Composters – conditional exemption

- Create an exemption for composters of all organic feedstocks up to 25 cubic yards, and set a limit of 100 cubic yards processed per year with no notification or reporting.
- Increase allowable on-site volume for group 2 post-consumer food waste, pre-consumer vegetative food waste, pre-consumer animal-based waste, yard debris, bulking agents, and manufactured organics, from 10 cubic yards to 250 cubic yards, and set a limit of 1000 cubic yards processed per year, with notification and reporting.
- Increase allowable on-site volume for group 3 yard debris, crop residues, manure and bedding, and bulking agents to 500 cubic yards, and set a limit of 2,500 cubic yards processed per year.
- Add yard debris and bulking agents to group 4 exemptions, up to 1000 cubic yards on-site, with a limit of 50 percent yard debris.
- Increase allowable on-site volume for group 4 agricultural wastes, zoo waste and bulking agents from 40 and 1000 cubic yards to no limit.
- Require composters of group 5 agricultural wastes and bulking agents to update their plans to include composting.
- Require all identified composters that manage operations to prevent migration of agricultural pests.

2.3.3 Composters – documentation

- Allow facilities to report volume or weight of feedstocks and composted material (instead of only weight-based reporting) in their annual reports to Ecology and the jurisdictional health department.
- Specify contents of quality assurance report for construction of new facilities, to include at least monitoring, testing, and documentation procedures.

2.3.4 Composters – training

- Define expectations for “properly trained” supervisors, to include training on the basics of composting, with classroom and hands-on course work, and receiving a certificate of completion that must be kept on site.
- Allow trained supervisors to provide training to employees to include training in appropriate facility operations, maintenance procedures, and safety and emergency procedures.

2.3.5 Composters – operating and testing

- Require documentation of compost pile temperatures representative of composting materials.
- Require cover for better pathogen temperature control in aerated static piles. This also controls odors.

- Require all facilities (instead of those composting only certain types of feedstock) to test for molybdenum and selenium. This is a new requirement for composted yard debris, manure, and bedding.
- Require compost samples tested to be representative of overall compost.
- Determine testing frequency based on volume of compost produced, instead of volume and type of feedstock.
- Allow for the storage of composted materials off of a pad, as long as facilities meet other standards in the rule and minimize runoff and odor issues.
- Limit compost physical contamination with film plastic to 0.25 percent of total weight, and require labeling of compost with physical contamination in excess of 0.1 percent to restrict use to contained uses, out of sensitive areas, and away from regulated waters.

2.3.6 Composters – operating plans

- Require facilities to keep the operating plan on-site.
- Require the operations plan to include a plan to manage air contamination such as odor and dust, including:
    - Documenting nuisance odor complaints.
    - An odor management plan to deal with nuisance odors.
    - A description of facility maintenance related to odor, in the odor management plan.
- Include composted materials in the material handling plan.
- Include capacity and maximum ability to process composting materials in the material handling plan.
- Require facilities to reject contaminated feedstock loads, or to plan to address contaminants and reduce physical contamination in composted material.
- Require a plan for representative sampling.
- Require description of staff training.

2.3.7 Composters – closure

- Specify that the owner or operator of a facility is financially responsible for removal of all solid wastes at closure of a composter.
- Specify that composted material is still a solid waste if still remaining on the site at time of closure.
- Require facilities to plan for closure at full capacity.

2.3.8 Composters – construction records

- Set a limit of 30 days after completing construction to submit construction records to the jurisdictional health department and Ecology.

2.3.9 Other organic material handling activities

- Create an exemption for other forms of organic material handling, including vermicomposting facilities managing all organic feedstocks to be conditionally exempt without notification or reporting up to 5,000 gallons or 25 cubic yards.
- Create exemptions for vermicomposters processing up to 250 cubic yards of all organic feedstocks from any source, or up to 1000 cubic yards feedstocks generated on site, or up to 1000 cubic yards of pre-consumer food waste, manure and yard waste from any source.
- Create a new category for conditional exemption for other organic material handling activities for any organic feedstocks in volumes up to 50,000 gallons of liquid wastes or 250 cubic yards of non-liquid organic feedstocks at any one time.

2.3.10 Anaerobic digesters – conditional exemption

- Add a section to the rule regulating anaerobic digesters based on requirements in RCW 70.95.330.
- Define applicability of the section to anaerobic digesters other than those already regulated under WAC 173-350-330 (storage or treatment of solid wastes in surface impoundments or tanks), chapter 90.48 RCW (Water Pollution Control), and chapter 173-308 WAC (Biosolids Management).
- Specify risk material (as prohibited by RCW 70.95.330 from anaerobic digester feedstocks) to include "skull, brain, trigeminal ganglia (nerves attached to brain and close to the skull exterior), eyes, spinal cord, distal ileum (a part of the small intestine), and the dorsal root ganglia (nerves attached to the spinal cord and close to the vertebral column) of cattle ages 30 months or older."
- Include conditional exemption for anaerobic digesters handling no more than 5,000 gallons or 25 cubic yards of all organic feedstocks.
- Include conditional exemption for anaerobic digesters handling 5,000-50,000 gallons or 25-250 cubic yards of all organic feedstocks, with notification, reporting and testing requirements.
- Include conditional exemption for anaerobic digesters handling livestock manure and up to 30% preconsumer organic feedstocks, with notification, design standards, use restrictions and testing requirements.

2.3.11 Anaerobic digesters – design standards

- Create design standards for permitted facilities.
- Require facilities to provide engineering reports, plans, specifications, and basis for the engineered features of the facility, including pads, impoundments, leachate management, digestate management, stormwater management, and digester features.
- Require facilities to submit a construction quality assurance plan that describes monitoring, testing, and documentation procedures to be followed during construction.
- Require facilities to provide all-weather roads for public access.
- Design all facility elements to prevent air, soil, surface water, and groundwater contamination.

- Require pads to be designed to:
    - Prevent ponding, control run-on and runoff, and collect and convey all stormwater and leachate.
    - Support the weight of material and equipment, as well as the pad itself.
    - Maintain structural and hydraulic integrity.
    - Prevent subsurface soil or groundwater contamination.
- Require stormwater and leachate management.
- Require ponds to have minimum 30-mil thickness liner of geomembrane on sufficient load-bearing substrate, and at least 18-inch freestanding boards to prevent water overtopping.

2.3.12 Anaerobic digesters – operating standards

- Create operating standards for permitted facilities.
- Require operation to control air contaminants such as dust and nuisance odors, prevent attraction of vectors, and prevent migration of agricultural pests.
- Require operation to ensure avoidance of dangerous waste, and use of properly trained supervisors and employees.
- Restrict access to the closed facility.
- Require inspection of the facility at least weekly, as needed.
- Require recordkeeping of:
    - Process monitoring data.
    - Quantity and types of feedstock.
    - Analytic results.
    - Inspection reports.
- Require an annual report of:
    - Annual quantity and types of feedstock.
    - Annual quantity of distributed digestate.
    - Annual summary of analytic results.
- Require testing and standards for distributed digestate off-site, to:
    - Protect human health and the environment.
    - Test representative samples of solids every 5,000 cubic yards, and meet compost quality standards in WAC 173-350-220(4), or
    - Ensure digestate meets commercial fertilizer standards, or
    - Send digestate to a composter for further processing, or
    - Land-apply or otherwise beneficially use digestate, including agricultural application in accordance with a nutrient management plan.
- Require development and keeping of an operations plan on site, including:
    - Types of feedstock to be handled.
    - Feedstock acceptance procedures.
    - Procedures for handling unacceptable wastes.
    - Processing plan to meet digestate distribution requirements.
    - A nutrient management plan, if using digestate in on-site agriculture.
    - Description of staff training.
- Calculation of monthly capacity.
    - A material flow plan.

    - An odor management plan, including emissions treatment, community relations, and prospective facility and operational improvements.
    - Inspection processes for groundwater monitoring, overfilling prevention equipment, and liners of surface impoundments and tanks, piping, and secondary containment.
    - Safety plans including a spill prevention and response plan.

2.3.13 Anaerobic digesters – closure requirements

- Create closure requirements for permitted facilities.
- Require development, keeping on site, and following a closure plan that includes at least removing all organic materials including digestate from the facility, assuming the facility is at capacity.
- Require notification of the jurisdictional health department within 60 days of closure.
- Specify that at closure the facility owner or operator is financially responsible for removing all organic materials from the facility, and for sending them to the appropriate waste handling facilities.

2.3.14 Anaerobic digesters – permit application

- Require – in addition to solid waste permitting requirements in WAC 173-350-710 and WAC 173-350-715 – each application to contain:
    - Engineering reports, plans, and specifications that address required design standards.
    - An operations plan as described in section 2.3.12.
    - A closure plan as described in section 2.3.13.

2.3.15 Anaerobic digesters – construction records

- Create construction record standards for permitted facilities.
- Prior to operation, require approval from the jurisdictional health department that the facility construction was done in accordance with the engineering report, plans, and specifications.
- Prior to operation, require approval from the jurisdictional health department of the construction documentation, and permit issuance.
- Require, within 30 days of completing construction, facilities to provide the jurisdictional health department and Ecology:
    - Copies of the construction record drawings for engineered facilities at the site.
    - A report documenting facility construction, including the results of required testing under the construction quality assurance plan.

Chapter 3: Likely Costs of the Adopted Rule Amendments

3.1 Introduction

Ecology estimated the expected costs associated with the adopted rule amendments to the Solid Waste Handling Standards rule, as compared to the baseline as described in section 2.2 of this document. The baseline is the regulatory circumstances in the absence of the adopted rule amendments. The costs analyzed are associated with the specific adopted amendments listed in section 2.3 of this document.

To the extent possible Ecology has quantified these impacts, and has otherwise described them qualitatively to include in overall assessment of the costs of the adopted rule amendments.

3.2 Affected facilities

The first step in determining the likely costs of the adopted rule amendments is determining how many facilities are regulated by the adopted rule amendments, and will likely need to change behavior as compared to behavior under the baseline. Affected facilities include composters, anaerobic digester facilities, and other organic processing facilities. For general compliance, Ecology used the current number of:

- Non-biosolids composters selling off-site (41)
  - 33 permitted composters
  - 8 exempt composters with notification or reporting requirements
  - Many small exempt composters that do not interact with regulatory agencies (have no notification or reporting requirements)
- Biosolids composting facilities regulated under chapter 173-350 WAC (4)
- Anaerobic digester operators (5; all exempt from permitting).

Ecology assumed that:

- Two new permitted composters would come on line each year.[1]
- One permit-exempt composter required to meet notification and testing standards would come on line each year.[2]
- One anaerobic digester would come on line every other year.

3.3 Expected costs of the adopted rule amendments

Ecology estimated the costs of requirements in which it had discretion, that differ from the baseline. Each of the costs discussed below corresponds to a change discussed in section 2.3.

[1] Based on professional experience, Ecology chose to estimate based on the high-bound number of possible future facilities. The actual number of facilities might be lower, but Ecology did not want to omit possible future facilities.
[2] Based on professional experience, Ecology chose to estimate based on the high-bound number of possible future facilities. The actual number of facilities might be lower, but Ecology did not want to omit possible future facilities.

3.3.1 General changes

3.3.1.1

The adopted rule amendments reduce time limits for complying with new requirements in the rule. As this amendment applies to new changes, and the requirement to comply would otherwise be immediate, Ecology does not consider this amendment to be significant, though it allows costs to be pushed back in time, thereby prospectively reducing their present value.

3.3.1.2

The adopted rule amendments update the definition of agricultural wastes to remove the minimum 15 pound weight requirement for animal carcasses. While this in theory allows more feedstocks to be recognized as agricultural waste, Ecology does not expect any existing facilities (or, based on them, future facilities) to be impacted by the adopted change.

3.3.1.3

The adopted rule amendments redefine feedstocks in terms of their specific contents, rather than the four groups listed in the baseline rule. Ecology does not expect this requirement to separately create costs or benefits, although new requirements for each of the feedstock types are expected to have impacts, and are discussed further in this chapter.

3.3.1.4

The adopted rule amendments require feedstocks not specifically addressed in the rule for exempt facilities to be approved by Ecology or the jurisdictional health authority. Ecology does not expect this to generate new costs as part of existing approval processes.

3.3.1.5

The adopted rule amendments require planning changes that may require all permitted entities to review, update, and submit some form of changes to existing plans. This will generate costs associated with review and submission fees at each jurisdictional health department.. This rule change is responsible only for any additional updating cycles that would not have occurred under the baseline. Based on jurisdictional health department input, Ecology estimated the cost of five hours of department review. Each jurisdictional health department has its own fee schedule, with fees ranging from zero (typically because they are included in new permit application or other fees) to $201 per hour. Ecology estimated a total cost of additional fees paid for updating plans as between $0 and $1,005 per facility. For 37

existing permitted facilities (new future facilities would pay the same new permit fees under both the baseline and adopted rule), this cost is $37,185.[3]

3.3.2 Composters – conditional exemption

3.3.2.1

The adopted rule amendments expand the type, size, and number of exemptions from permitting for composters. These include:

- Create an exemption for group 1 composters of all organic feedstocks up to 25 cubic yards without notification or reporting requirements.
- Increasing allowable on-site volume for group 2 composters of all organic feedstocks from 10 cubic yards to 250 cubic yards, with a maximum volume of 1,000 cubic yards in a year with notification and reporting requirements.
- Increasing allowable on-site volume for group 3 composters of yard debris, crop residues, manure and bedding, and bulking agents, from 40 and 250 to 500 cubic yards, and setting a limit of 2,500 cubic yards processed per year.
- Adding yard debris and bulking agents to group 4 exemptions, up to 1,000 cubic yards on-site, with a limit of 50 percent yard debris.
- Increasing allowable on-site volume for group 5 composters of agricultural wastes and bulking agents from 40 and 1,000 cubic yards, to no limit.

These adopted rule amendments allow more facilities to potentially become conditionally exempt (as long as they meet the conditional requirements). This would not only encompass the one new exempt facility that is required to perform notification or reporting tasks, but innumerable small facilities that would not need to interact with Ecology at all, and would be exempt from permitting. An example of such facilities is a school, or school system, with small composting programs of on-site food waste.

Ecology does not believe this amendment creates a new cost.

The increased availability of exemptions from permitting would benefit facilities through:

- Increasing the volume or changing the content of an existing composting program, as a facility sees beneficial. This includes combining composting from multiple locations (for example, schools within a district). This benefit would be available to existing and future facilities that are exempt under the baseline.[4]
- Avoiding the costs of permitting, less any costs of complying with the requirements for conditional exemption.

[3] Ecology estimated the workload and consulting costs associated with each type of new plan update, in the sections below.

[4] All of the adopted rule amendments addressing the types and breadth of exemptions would only prospectively allow MORE facilities to function as permit-exempt; no facilities would be required to get a solid waste permit under the adopted rule if they would not be required to have one under the baseline.

- Encouraging more facilities to enter the market. That is, some facilities might start small composting programs if the adopted expansions to permit exemption are available, but would not compost at all under the baseline.

Benefits are estimated in section 4.3 of this document.

3.3.2.2

The adopted rule amendments require group 5 composters of agricultural wastes and bulking agents to update their farm plans to include composting, or ensure their existing plans address composting. Ecology assumed two exempt facilities would potentially incur additional costs of updating their plans to include composting. In addition, Ecology assumed one facility per year will become conditionally exempt, and need to meet this new requirement. In the final adopted rule, Ecology also allowed flexibility in updating requirements.

Ecology assumed a facility would incur two hours of inside administrative or outside engineer time to update a plan. This is likely an overestimate, as some facilities' plans likely already address composting. For two hours of internal administrative or outside contracted engineer time at existing facilities, and eight hours at new facilities, ecology used the prevailing hourly wage in Washington State of $16.86 to $80.45.[5] With two facilities incurring this cost immediately, and one new facility incurring this cost each year, this cost has a present value of $2,293 – $10,941 over 20 years.[6]

3.3.2.3

The adopted rule amendments require group 4 and group 5 facilities processing more than 25 cubic yards to notify Ecology. Facilities would need to notify 30 or more days prior to operation as an exempt facility, and also notify the jurisdictional health department. There are no existing facilities that are in this category and have notified. Ecology assumed one facility per year will become conditionally exempt as well, but would not need to meet this requirement, as they would already be required to notify under WAC 173-350-220. Ecology does not expect this change to create additional costs.

3.3.2.4

The adopted rule amendments require facilities processing more than 25 cubic yards on site, that distribute composted material off site, to test for and reduce pathogens (fecal coliform or salmonella). This adopted rule amendment adds testing and reporting requirements for this set of conditionally exempt composters. Most analytic laboratories, however, include these additional elements in a package of composting analysis. Ecology does not expect this change to create additional costs.

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[5] US Bureau of Labor Statistics, 2011 Wage Survey by area and occupation. Average wages for administrative engineering professions. Outside engineer wage adjusted for overhead according to Washington State Office of Financial Management guidelines.

[6] At the average rate of 1.45 percent real return on US Treasury I-Bonds. Present value accounts for future costs in current dollars, accounting for both inflation and investment opportunities.

3.3.2.5

The adopted rule amendments require all exempt composters to manage operations to prevent migration of agricultural pests. Ecology does not expect this to separately create a new cost, but expects it to be part of other compliance costs for required feedstock, operations, and odor management, below.

3.3.3 Composters – documentation

3.3.3.1

The adopted rule amendments allow facilities to report volume or weight of feedstocks and composted material (instead of allowing only weight-based reporting) in their annual reports to Ecology and the jurisdictional health department. Ecology does not expect this change to create a new cost.

3.3.3.2

The adopted rule amendments specify the contents of the quality assurance report for construction of new facilities that have engineering reports. Ecology does not expect this requirement to affect existing composters. Ecology believes this cost could be included in existing engineering report costs.

3.3.4 Composters – training

3.3.4.1

The adopted rule amendments define expectations for "properly trained" supervisors, to include training on the basics of composting, with classroom and hands-on work, and receiving a certificate of completion that must be kept on site, at permitted facilities. Ecology assumed each training would cost $1,000.[7] Ecology assumed that one half of existing permitted facilities would need to train one supervisor. With half of existing permitted facilities and two new facilities each year incurring this cost, and five-year turnover, this cost has a present value of $191,953 over 20 years.[8] Many existing facilities would not incur this cost if they have already completed this training for supervisors.

3.3.4.2

The adopted rule amendments define expectations for new employees, to include training in appropriate facility operations, maintenance procedures, and safety and emergency procedures. This training may be provided by a supervisor. Ecology assumed this training would be included in existing on-the-job training of employees. Ecology does not expect this requirement to generate significant new cost.

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[7] Rounded upper bound of available training and certification through national organizations. Does not include travel costs to training site.

[8] At the average rate of 1.45 percent real return on US Treasury I-Bonds. Present value accounts for future costs in current dollars, accounting for both inflation and investment opportunities.

3.3.5 Composters – operating and testing

3.3.5.1

The adopted rule amendments require documentation of compost pile temperatures representative of composting materials. Ecology does not believe this requirement will generate significant new cost.

3.3.5.2

The adopted rule amendments require a cover layer of compost for better pathogen temperature control in aerated static piles. Ecology expects this requirement to help control odors. Ecology assumed the typical facility would need to temporarily lose the processing capacity of a cover layer of finished compost (i.e., they would have to use some of their existing finished product to cover in-progress piles), but this layer would later be incorporated into the marketable product. Ecology assumed this delay cost would not be significant, as the cover product would still be incorporated and sold. Also, most aerated static pile facilities already use a cover layer.

3.3.5.3

The adopted rule amendments require all facilities to test for molybdenum and selenium. This is a new requirement for composted yard debris, manure, and bedding. Ecology does not believe this amendment will result in significant costs, as existing packages used for testing compost include these compounds, and results are available without additional sampling or testing. Additional testing costs are unlikely to be incurred.

3.3.5.4

The adopted rule amendments require all facilities to test using samples that are representative of overall compost composition. Ecology does not believe this requirement creates a new cost, as representative sampling would not require significantly different procedures.

3.3.5.5

The adopted rule amendments require that testing frequency be determined based on volume of compost produced, instead of volume and type of feedstock. Ecology does not believe this change would create a separate cost, but its impact on testing costs is included in analyses of sampling costs throughout this document.

3.3.5.6

The adopted rule amendments allow for the storage of composted materials off of a pad, as long as facilities meet other standards in this rule and minimize runoff and odor issues. Ecology does not expect this change to create new costs.

3.3.5.7

The adopted rule amendments limit physical contamination of compost with film plastic to 0.25 percent of total compost weight, with labeling requirements for final product exceeding 0.1 percent film plastic. Ecology believes facilities can comply with this new requirement through facility contracts with feedstock providers, or additional screening of compost. Testing for this requirement can be included in testing for the existing requirement of less than one percent physical contamination by weight, at little or no additional cost.

Based on a survey of 60 samples, Ecology determined that the only products likely to fail the 0.1 percent standard (under existing practices) were coarse screened products that included food waste as a feedstock.[9] Ecology noted that even in this subset, not all samples failed. None of the samples exceeded 0.25 percent film plastics level, however, and Ecology assumed those composts between 0.1 percent and 0.25 percent would take advantage of the conditional allowance for compost meeting all other requirements but with film plastics in this range, and would label and continue to sell this compost at minimal additional cost.[10]

For context, using the sampling data and the most recent fully operational year's final product production reported, 40 – 100 percent of coarse compost at any given facility had between 0.1 percent and 2.5 percent film plastics content, and 8 – 100 percent of all compost at four facilities using food waste fell into this category.[11]

Ecology noted that one sample at one facility did not meet the one percent standard for total physical contaminants (and would likely incur the costs of screening or other actions to reduce contaminants), but this requirement is part of the baseline.[12] Ecology was not required to include baseline costs in its cost estimate for the adopted rule.

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[9] Some proportion of the product is not represented in this sampling (low-value products were not included in sampling), but Ecology expects the baseline and adopted rule circumstances to be the same for that highly-contaminated product category. Please see the Concise Explanatory Statement for further comment.

[10] Existing packaging design and material data sheets allow for minimal costs associated with including required labeling (especially as the language governing this label is flexible beyond literal content). Additional minimal costs could include adding language to existing label design, or including required language on a product informational sheet.

[11] Ecology notes this outcome uses weighted sampling results (and conservatively assumed that data on mixed or prospectively coarse OR fine compost products represented product that was entirely coarse), with weights assigned based on the most recent fully-operational year's proportion of potentially coarse compost to total production. Ecology chose to use the most recent fully-operational year (instead of a historical average) in the main presentation here, because of the degree of change in the municipal food waste stream during the available data years. This may have affected the relative proportions of coarse and fine compost produced, if for example, a large municipality began a food waste program that went to compost. Using historical average production data, 27 – 66 percent of compost at an average facility using food waste could be coarse final product.

[12] Exceedance was only of the total physical contaminants standard, due to other types of physical contaminant. Film plastics were within allowable levels not requiring additional screening.

At remaining facilities without failing samples, Ecology determined the restriction and labeling requirements would not create new costs. This is because their compost was not coarse final product containing municipal food waste.

3.3.5.8

The adopted rule amendments require testing and reporting of compost quality variables, providing compost end-users more information on quality. Ecology believes this reporting can be done as part of other testing and reporting behavior.

3.3.6 Composters – operating plans

3.3.6.1

The adopted rule amendments require facilities to keep the operating plan on site. Ecology does not believe this requirement results in additional costs.

3.3.6.2

The adopted rule amendments require the plan of operation to include a plan to manage air contamination such as odor and dust, including documenting nuisance odor complaints, and an odor management plan to deal with nuisance odors. Ecology assumed each of the 37 existing permitted facilities would need to develop and follow such a plan, as would the two new facilities each year.

Ecology assumed each facility would need 20 hours of inside administrative or outside engineer time to develop such a plan,[13] and could otherwise include the incremental recordkeeping of complaints in existing workload. Ecology used an hourly prevailing wage of $16.86 to $80.45.[14] With 33 existing facilities and two new facilities per year incurring this cost, this is a present value of $23,607 to $112,644.[15]

3.3.6.3

The adopted rule amendments require facilities to include composted materials in the material handling plan. Ecology does not believe this change will create significant costs in addition to the plan updating costs (or plan creation costs for new facilities).

[13] Ecology received public comment on the rule as it was initially proposed, that more time would be required to develop these plans, in the order of 50 hours. Ecology has since then simplified requirements in the final rule – in particular for odor planning – and considers 20 hours to be appropriate. For informational purposes, 50 hours spent on this task would increase costs for the operating plan to $59,018 – $281,610, and total estimated rule costs to $265,719 – $543,940.

[14] US Bureau of Labor Statistics, 2011 Wage Survey by area and occupation for administrative and engineering professions, with engineer wage adjusted for overhead costs according to Washington State OFM guidelines.

[15] At the average rate of 1.45 percent real return on US Treasury I-Bonds. Present value accounts for future costs in current dollars, accounting for both inflation and investment opportunities.

3.3.6.4

The adopted rule amendments require facilities to include capacity and maximum ability to process composting materials in the material handling plan. Ecology does not believe this change will create significant costs in addition to the plan updating costs (or plan creation costs for new facilities).

3.3.6.5

The adopted rule amendments require facilities to reject contaminated feedstock loads, or to plan to address contaminants and reduce physical contamination in composted material. Ecology does not believe this requirement creates costs separable from adopted rule sections requiring analysis and management of contamination, or limits on physical contamination.

3.3.6.6

The adopted rule amendments require facilities to have a plan for representative sampling. Ecology does not believe this change will create significant costs in addition to the plan updating costs (or plan creation costs for new facilities).

3.3.6.7

The adopted rule amendments require a description of staff training to be included in facility plans. Ecology does not believe this change creates a cost that is separable from training and documentation requirements.

3.3.7 Composters – closure

3.3.7.1

The adopted rule amendments specify that the owner or operator of a facility is financially responsible for removal of all solid wastes at closure of a composter. Ecology does not believe this is a significant change from previously existing requirements, but a clarification to state it directly. Ecology does not expect this change to create new costs.

3.3.7.2

The adopted rule amendments specify that composted material is still a solid waste if still remaining on the site at time of closure. Ecology does not believe this is a significant change from previously existing requirements, but a clarification to state it directly. Ecology does not expect this change to create new costs.

3.3.7.3

The adopted rule amendments require facilities to plan for closure at full capacity. This change may require existing facilities to rewrite their closure plans, and will be a requirement for new facilities. Ecology conservatively assumed all 37 existing permitted facilities, as well as two new permitted facilities per year, would need to

write new closure plans based on full capacity. Ecology assumed this work would take 0.5 additional hours of inside administrative or outside engineer time per facility. This cost stream at prevailing wage rates[16] is equivalent to a present value of $590 to $2,815 over 20 years.[17]

3.3.8 Composters – construction records

The adopted rule amendments set a limit of 30 days after completing construction to submit construction records to the jurisdictional health department and Ecology. Ecology does not believe this change will result in a significant new cost.

3.3.9 Other organic material handling activities

3.3.9.1

The adopted rule amendments create an exemption for other forms of organic material handling including vermicomposters that take all organic feedstocks from off-site to be conditionally exempt without notification or reporting requirements up to 25 cubic yards. Some facilities could benefit from this new exemption, compared to having no exemption under the baseline. These facilities could save the costs of permitting, less the costs of complying with the adopted rule's exemption.

3.3.9.2

The adopted rule amendments restrict the exemption for vermicomposters processing above 1,000 cubic yards. This change does not affect existing facilities in addition to applicable requirements that already existed for composters.[18] Ecology does not believe this change creates new costs.

3.3.9.3

The adopted rule amendments create a new category of exemption for other organic material handling activities, managing up to 50,000 gallons of liquid wastes, or 250 cubic yards of non-liquid, organic feedstocks on site at any one time, and apply requirements for performance, pest control, odors, inspections, and notification. This change does not affect existing facilities. There are currently no facilities operating that would fall into this category, and future facilities would encounter less cost under the exemption if they fell within the conditional requirements. Ecology does not believe this change creates new costs.

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[16] US Bureau of Labor Statistics, 2011 Wage Survey by area and occupation for administrative and engineering professions, with engineer wage adjusted for outside overhead costs according to Washington State OFM guidelines. The overall range is $16.86 – $80.45.

[17] At the average rate of 1.45 percent real return on US Treasury I-Bonds. Present value accounts for future costs in current dollars, accounting for both inflation and investment opportunities.

[18] For example, an "applicable" requirement could be in administrative processes and plans, but not include testing, as vermicompost would not be required to meet composter testing standards.

3.3.10 Anaerobic digesters – conditional exemption

3.3.10.1

The adopted rule amendments add a section to the rule regulating anaerobic digesters based on requirements in RCW 70.95.330. The requirements explicitly in the statute are not subject to economic analysis (they are part of the baseline). The impact of other requirements in which Ecology had discretion is addressed below.

3.3.10.2

The adopted rule amendments defines applicability of the section to anaerobic digesters other than those already regulated under WAC 173-350-330 (storage or treatment of solid wastes in surface impoundments or tanks), chapter 90.48 RCW (Water Pollution Control), and chapter 173-308 (Biosolids management). Ecology performed the analyses below based on five existing (all exempt) anaerobic digester facilities. This applicability, in and of itself, does not create a new cost.

3.3.10.3

The adopted rule amendments specify risk material (as prohibited generally by RCW 70.95.330 from anaerobic digester feedstocks) to include particular bovine matter as described in section 2.3.10 of this document. Ecology does not believe this requirement creates a new cost for facilities, as they are already compliant (or will need to be compliant, if they are future facilities) with baseline operating standards complying with RCW 70.95.330 that make it unlikely they will need to change this behavior under the adopted rule amendments, since they already do not include the prohibited bovine matter.

3.3.10.4

The adopted rule amendments create a new category for conditional exemption, including all organic feedstocks in volumes up to 5,000 gallons of liquid wastes, or 25 cubic yards of non-liquid organic feedstocks at any time without notification or reporting requirements and up to 50,000 gallons or 250 cubic yards with notification and reporting. There are also associated conditions required for these exemptions, as described in section 2.3.10 of this document. There are currently no facilities operating that would fall into these categories, and future facilities would encounter less cost under the exemption if they fell within the conditional requirements. Ecology does not believe this requirement creates a new cost.

3.3.10.5

The adopted rule amendments set notification, inspection, pest prevention, and operational requirements identical to those of composters. Digester facilities already meet these operating standards under the baseline, by meeting previously existing composter standards, and so do not incur additional costs to comply with requirements specific to anaerobic digesters in the adopted rule amendments.

3.3.11 Anaerobic digesters – design standards

3.3.11.1

The adopted rule amendments require facilities to submit a construction quality assurance plan that describes monitoring, testing, and documentation procedures to be followed during construction. Ecology believes compliance with this change could be achieved as part of other design standard documentation.

3.3.11.2

The adopted rule amendments require facilities to provide all-weather roads for public access. Facilities already meet this standard under baseline waste management under law and the previously existing rule. Ecology does not expect this change to create new costs.

3.3.11.3

The adopted rule amendments require facilities to design all facility elements to prevent air, soil, surface water, and groundwater contamination. Ecology believes this is also a requirement under the baseline rule and other environmental law governing those forms of pollution, and protecting air, soil, water, sediments, and human and environmental health. Ecology does not expect this change to create new costs.

3.3.11.4

The adopted rule amendments require pads to be designed to prevent contamination, damage, and degradation, as described in section 2.3.11 of this document. Facilities are already required to comply with this requirement under baseline waste management. Ecology does not expect this change to create new costs.

3.3.11.5

The adopted rule amendments require stormwater and leachate management. Facilities are already required to comply with this requirement under baseline waste management. Ecology does not expect this change to create new costs.

3.3.11.6

The adopted rule amendments require ponds to have minimum 30-mil thickness liner of geomembrane on sufficient load-bearing substrate, and at least 18-inch freestanding boards to prevent water overtopping. Existing anaerobic digesters operate under the permit exemption for dairies, and would not be impacted by this change, as compared to previously existing requirements. Permitted anaerobic digesters beginning operations in the future could be impacted by this change, but would also already be required to use these liner standards for leachate pond management.

3.3.12 Anaerobic digesters – operating standards

3.3.12.1

The adopted rule amendments sets operating standards for permitted anaerobic digesters. There are currently no facilities operating that would fall into this category. The adopted rule amendments require operations to control air contaminants such as dust and nuisance odors, prevent attraction of vectors, and prevent migration of agricultural pests. Facilities are already required to comply with this requirement under the baseline, as they are governed by the previous rule. Ecology does not expect this change to create new costs.

3.3.12.2

The adopted rule amendments require use of properly trained supervisors and employees. Ecology does not expect this change to create new costs, as anaerobic digester owners and operators will likely be trained in the use of their digesters by the vendor.

3.3.12.3

The adopted rule amendments require digester facilities to restrict access when the facility is closed. Ecology does not believe this change will create new costs as facilities likely restrict access due to other incentives like preventing trespass and theft.

3.3.12.4

The adopted rule amendments require at least weekly inspection of facilities, as needed (allowing for more frequent inspection if necessary). Ecology believes facilities are already required to comply with this requirement under the baseline previously existing rule. Ecology does not believe this change will create new costs.

3.3.12.5

The adopted rule amendments require recordkeeping tasks, as described in section 2.3.12 of this document. Ecology believes facilities are already required to comply with this requirement under the baseline previously existing rule. Ecology does not believe this change will create new costs.

3.3.12.6

The adopted rule amendments require facilities to prepare and submit an annual report containing operations information as described in section 2.3.12. Ecology believes facilities are already required to comply with this requirement under the baseline. Ecology does not believe this change will create new costs.

3.3.12.7

The adopted rule amendments require facilities that distribute digestate off site to meet testing requirements and contents standards, as described in section 2.3.12. Ecology believes facilities are already largely required to comply with these requirements under the baseline, and incremental additional testing could be performed as part of existing panels of tests. Ecology does not believe this change will create new costs.

3.3.12.8

The adopted rule amendments require permitted facilities to develop and keep an operations plan on site, including plan components as described in section 2.3.12. None of the existing facilities are permitted. Ecology conservatively assumed that one new facility every two years would possibly need to develop such a plan. Ecology assumed that each facility would require 40 hours of internal administrative or outside contracted engineer time, at an hourly wage of $16.86 to $80.45.[19] This is a present value $11,720 to $55,924 over 20 years.[20]

3.3.13 Anaerobic digesters – closure requirements

3.3.13.1

The adopted rule amendments set closure requirements for permitted anaerobic digesters. There are currently no facilities operating that would fall into this category. The adopted rule amendments require permitted facilities to develop, keep, and follow a closure plan that includes at least removing all organic materials including digestate from the facility, assuming the facility is at capacity. Ecology believes facilities are largely required to comply with this requirement under the baseline, but the capacity requirement may require facilities to rewrite closure plans.

No existing facility is permitted. Ecology assumed that one new facility every two years would need to develop such a plan or determine that existing plans are sufficient. Ecology assumed this work would take 0.5 additional hours of inside administrative or outside engineer time per facility. At the prevailing wage rates of $16.86 to 80.45,[21] this cost stream is equivalent to a present value of $146 to $697 over 20 years.

3.3.13.2

The adopted rule amendments require facilities to notify the jurisdictional health department within 60 days of closure. Ecology does not expect this requirement to generate significant costs relative to existing notification.

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[19] US Bureau of Labor Statistics, 2011 Wage Survey by area and occupation for administrative and engineering professions, with engineer wage adjusted for overhead costs according to Washington State OFM guidelines.

[20] At the average rate of 1.45 percent real return on US Treasury I-Bonds. Present value accounts for future costs in current dollars, accounting for both inflation and investment opportunities.

[21] US Bureau of Labor Statistics, 2011 Wage Survey by area and occupation for administrative and engineering professions, with engineer wage adjusted for overhead costs according to Washington State OFM guidelines.

3.3.13.3

The adopted rule amendments specify that at closure the facility owner or operator is financially responsible for removing all organic materials from the facility, and for sending them to the appropriate waste handling facilities. Ecology does not believe this is a significant change from previously existing requirements, but a clarification to state it directly. Ecology does not expect this change to create new costs.

3.3.14 Anaerobic digesters – permit application

3.3.14.1

The adopted rule amendments require facilities that are not exempt to obtain a solid waste permit from the jurisdictional health department. Ecology believes facilities are required to comply with this requirement under the baseline. There are currently no facilities operating that would fall into this category. Ecology does not expect this change to create new costs.

3.3.14.2

The adopted rule amendments require (in addition to solid waste permitting requirements in chapter 173-350 WAC) permit applications to contain specific contents as described in section 2.3.14. Ecology believes facilities are required to comply with this requirement under the baseline, as it is part of solid waste permitting. Ecology does not expect this change to create new costs beyond the costs of creating an operations and a closure plan, as estimated above.

3.3.15 Anaerobic digesters – construction records

3.3.15.1

The adopted rule amendments sets construction record standards for permitted anaerobic digesters. There are currently no facilities operating that would fall into this category. The adopted rule amendments require that prior to operation, facilities have approval from the jurisdictional health department regarding the construction procedures' adherence to design and quality assurance plans. Ecology believes facilities are required to comply with this requirement under the baseline. Ecology does not expect this change to create new costs.

3.3.15.2

The adopted rule amendments require that prior to operation, facilities have approval from the jurisdictional health department regarding the construction documentation and permit issuance. Ecology believes facilities are required to comply with this requirement under the baseline. Ecology does not expect this change to create new costs.

3.3.15.3

The adopted rule amendments require facilities, within 30 days of completing construction, to provide the jurisdictional health department and Ecology with construction drawing records, and a report of facility construction and quality assurance testing results. Ecology does not believe the time limit change will create new costs.

3.4 Total expected costs

Ecology estimated present-value compliance costs over 20 years for the adopted rule amendments. Table 3 below shows estimated total costs, in 20-year present values.

Table 3: Likely Cost of the Adopted Rule Amendments

COMPOSTER COSTS	Low	High
Fees to update plans	$0	$37,185
Update plans for group 5 composters	$2,293	$10,941
Supervisor training	$191,953	$191,953
Odor plan	$23,607	$112,644
Closure plan	$590	$2,815
ANAEROBIC DIGESTER COSTS	**Low**	**High**
Operating report	$11,720	$55,924
Closure plan	$146	$697
TOTAL 20-YEAR COSTS	**$230,309**	**$412,159**

The total quantifiable present-value costs of the adopted rule amendments are approximately $230,309 – $412,159. Where prices, number of applicable facilities, or timing were uncertain, Ecology made assumptions that would overestimate costs, as to conservatively underestimate net benefits of the adopted rule amendments.

Chapter 4: Likely Benefits of Adopted Rule Amendments

4.1 Introduction

Ecology analyzed the likely benefits of the adopted rule amendments, compared to the baseline. These benefits are based on the adopted rule amendments' ability to reduce environmental impacts on other parties and end-user costs, arising from composters and anaerobic digesters. To the extent possible Ecology has quantified these impacts, and has otherwise described them qualitatively to include in overall assessment of the benefits of the adopted rule amendments.

4.2 Affected parties

Ecology expects the adopted rule amendments to result in reduced air-quality impacts (for example, odors) on the public, and reduced costs incurred by compost end-users to deal with low quality compost (high foreign-matter contents). This is likely to benefit:

- Populations surrounding some compost sites.
- End-users of compost from regulated facilities.

In addition, some elements of the adopted rule amendments also likely reduce costs significantly for some complying facilities.

4.3 Expected benefits of the adopted rule amendments

Ecology estimated the following benefits likely to arise from the adopted rule amendments, as compared to the baseline, and only in cases where Ecology had discretion. Each of the benefits discussed below corresponds to a change discussed in section 2.3.

4.3.1 General changes

Overall, the public and environmental health, as well as composter and digester facilities, are expected to benefit from having all composter and digester regulations in one place. This facilitates compliance with the rule by reducing uncertainty and costs of understanding and following the rule.

4.3.1.1

The adopted rule amendments update the definition of agricultural wastes to remove the minimum 15 pound weight requirement for animal carcasses. While this in theory allows more feedstocks to be recognized as agricultural waste, Ecology does not expect any existing facilities (or, based on them, future facilities) to be impacted by the adopted change.

4.3.1.2

The adopted rule amendments redefine feedstocks in terms of their specific contents, rather than the four groups listed in the baseline rule. Ecology does not expect this requirement to separately create costs or benefits, although new requirements for each of the feedstock types are expected to have impacts, and are discussed further in this chapter.

4.3.1.3

The adopted rule amendments require feedstocks at exempt facilities not specifically addressed in the rule to be approved by Ecology or the jurisdictional health authority. Ecology expects this change to benefit composters by allowing some flexibility in feedstock use.

4.3.2 Composters – conditional exemption

4.3.2.1

The adopted rule amendments expand the type, size, and number of exemptions from permitting for composters, anaerobic digesters, and aerobic digesters. These include:

- Creating an exemption for group 1 composters of all organic feedstocks up to 25 cubic yards, adding a maximum of 100 cubic yards in a year without notification or reporting.
- Increasing allowable on-site volume for group 2 composters of post-consumer food waste, pre-consumer vegetative waste, pre-consumer animal-based waste, yard debris, bulking agents, and manufactured organics, from 10 cubic yards to 250 cubic yards, adding a maximum of 1000 cubic yards in a year with notification and reporting.
- Increasing allowable on-site volume for group 3 composters of yard debris, crop residues, manure and bedding, and bulking agents, from 40 and 250 cubic yards, to 500 cubic yards and setting a limit of 2,500 cubic yards processed per year.
- Adding yard debris and bulking agents to group 4 exemptions, up to 1,000 cubic yards on-site, with a limit of 50 percent yard debris.
- Increasing allowable on-site volume for group 5 composters of agricultural wastes and bulking agents from 40 and 1,000 cubic yards, to no limit.

These adopted rule amendments allow more facilities to potentially become conditionally exempt (as long as they meet the conditional requirements). This would not only encompass the one new exempt facility that is required to perform notification or reporting tasks, but innumerable small facilities that would not need to interact with Ecology at all, and would be exempt from permitting. An example of such facilities is a school, or school system, with small composting programs of on-site food waste. Ecology believes this amendment creates a new benefit.

The increased availability of exemptions from permitting would benefit facilities through:

- Increasing the volume or changing the content of an existing composting program, as a facility sees beneficial. This includes combining composting from multiple locations (for example, schools within a district). This benefit would be available to existing and future facilities that are exempt under the baseline.[22]
- Avoiding the costs of permitting, less any costs of complying with the requirements for conditional exemption.
- Encouraging more facilities to enter the market. That is, some facilities might start small composting programs, since the adopted expansions to permit exemption would be available, but would not compost at all under the baseline.

Ecology could not confidently estimate the benefits for small facilities that meet exemptions and do not have to notify or report to Ecology.

Ecology estimated the minimum costs savings for the one facility each year to meet the permit exemption and require notification to Ecology. This cost savings was based on avoided permit fees, and represents a minimum cost savings. Actual cost savings would include the avoided costs of specific permit requirements, less the costs of complying with any conditional exemption requirements. Ecology estimated that the average avoided annual permit fee for a compost facility with a solid waste permit is, on average, $2,300. One new facility beginning to incur this annual cost savings each year would save (in present value) **$398,924** in annual fees over 20 years. Again, this is the minimum likely benefit of the adopted rule amendments, and does not account for the many small compost facilities (schools, small businesses) that would not require any interaction with Ecology if they were exempt from permitting.

4.3.2.2

The adopted rule amendments require group 5 composters of agricultural wastes and bulking agents to update their plans to include composting. Ecology expects this requirement to benefit public health and the environment by requiring more exempt facilities to prepare a composting plan and consider all elements of comprehensive composting procedure. This would reduce risk of contamination to the environment, and consequently to public health through contaminated water, air (odors, possible noxious chemicals) and soils.

4.3.2.3

The adopted rule amendments require group 4 and group 5 facilities processing more than 25 cubic yards of off-farm yard debris to notify Ecology. Group 5 facilities would need to notify 30 or more days prior to operation as an exempt facility, and also notify the jurisdictional health department. Ecology expects this requirement to

[22] All of the adopted rule amendments addressing the types and breadth of exemptions would only prospectively allow MORE facilities to function as permit-exempt; no facilities would be required to get a solid waste permit under the adopted rule if they would not be required to have one under the baseline.

benefit public health and the environment by requiring more exempt facilities to notify regulators of their operations, allowing for appropriate guidance and regulatory oversight. This would reduce risk of contamination to the environment, and consequently to public health through contaminated water, air (odors, possible noxious chemicals) and soils.

4.3.2.4

The adopted rule amendments require facilities processing more than 25 cubic yards on site, that distribute composted material off site, to test for and reduce pathogens (fecal coliform or salmonella). This adopted rule amendment adds testing and reporting requirements for this set of conditionally exempt composters. Ecology expects this requirement to benefit public health and the environment by requiring more exempt facilities that distribute their compost to other parties (where it may be handled or otherwise encountered by staff and the public) to test for pathogens that are potentially harmful to human and environmental health. This would reduce risk of contamination to public health through contaminated compost and soils. It would also potentially reduce the risk of spreading pathogens to the environment.

4.3.2.5

The adopted rule amendments require all exempt composters to manage operations to prevent migration of agricultural pests. Ecology does not expect this to separately create a new benefit, but expects it to be part of other benefits associated with required feedstock, operations, and odor management, below.

4.3.3 Composters – documentation

4.3.3.1

The adopted rule amendments allow facilities to report volume or weight of feedstocks and composted material (instead of allowing only weight-based reporting) in their annual reports to Ecology and the jurisdictional health department. Ecology expects this change to theoretically benefit those composters that do not have scales (in reporting feedstock and composted material quantities), but no practical impact. Ecology currently accommodates facilities without scales by allowing conversion factors.

4.3.3.2

The adopted rule amendments specify the contents of the quality assurance report for construction of new facilities, as described in section 2.3.3. Ecology does not expect this requirement to affect existing composters. Ecology expects this change to benefit a facility's design through establishment of specific ways in which the facility's construction will be assured to meet construction planning standards.

4.3.4 Composters – training

4.3.4.1

The adopted rule amendments define expectations for "properly trained" supervisors, to include training on the basics of composting, with classroom and hands-on work, and receiving a certificate of completion that must be kept on site. Ecology expects this requirement to reduce the risk of environmental contamination and air or water quality issues that affect the public wellbeing, by ensuring that supervisors have appropriate knowledge of environmentally compliant composting procedures.

4.3.4.2

The adopted rule amendments define expectations for new employees, to include training in appropriate facility operations, maintenance procedures, and safety and emergency procedures. This training may be provided by a supervisor. Ecology expects this requirement to reduce the risk of environmental contamination and air or water quality issues that affect the public wellbeing, by ensuring that employees also have appropriate knowledge of operations, maintenance, and safety procedures at their facility.

4.3.5 Composters – operating and testing

4.3.5.1

The adopted rule amendments require documentation of compost pile temperatures representative of composting materials. This may require composters to take an additional sample of temperature. Ecology expects more representative knowledge of pile temperatures to support appropriate compost management, and reduce likelihood of unexpected nuisance odor issues affecting the public wellbeing.

4.3.5.2

The adopted rule amendments require a cover for better pathogen temperature control in aerated static piles. Ecology expects this requirement to reduce risks associated with pathogens in final product and help control odors, benefitting nearby populations that might otherwise experience nuisance odors.

4.3.5.3

The adopted rule amendments require all facilities to test for molybdenum and selenium. This is a new requirement for composted yard debris, manure, and bedding. Ecology expects this change to benefit composting facilities, and end-users of compost, by limiting the amounts of molybdenum and selenium in compost. Repeated or heavy applications of compost with molybdenum and selenium may result in ground or water concentrations in excess of what is safe to people and wildlife. Additional testing for these components also contributes to understanding of whether and when problems occur, and when they do not. This benefit is limited, however, by the existing inclusion of these compounds in testing packages.

4.3.5.4

The adopted rule amendments require all facilities to test using samples that are representative of overall compost composition. Ecology expects this change to support more accurate analyses, and therefore more protective operational characteristics and procedures at compost facilities. This benefit facilitates compliance with the rule as well.

4.3.5.5

The adopted rule amendments require that testing frequency be determined based on volume of compost produced, instead of volume and type of feedstock. Ecology believes this change will allow for more consistent requirements across facilities, benefitting compliance. It would also allow facilities to meet the standards of the rule based on the overall compost product, accounting for various mixtures of feedstock, and changes in feedstock mix at any given facility.

4.3.5.6

The adopted rule amendments allow for the storage of composted materials off of a pad, as long as facilities meet other rule standards and minimize runoff and odor issues. Ecology believes this change allows facilities flexibility in operations based on the best internal business decisions, while still meeting the goals of health and environmental protectiveness.

4.3.5.7

The adopted rule amendments limit physical contamination of compost with film plastic to 0.25 percent of total compost weight, with labeling requirements for final product exceeding 0.1 percent film plastic. Ecology believes facilities can comply with this new requirement through contracting with feedstock providers, or additional screening of compost. Ecology expects this change to benefit long-run salability of compost from Washington State, by ensuring a minimum level of quality that addresses end-user concerns about physical contamination.

Under the baseline, end-users of compost have experienced increasing quantities of physical contamination (of which a large proportion is film plastic). As municipalities across the state increasingly encourage household composting through their municipal pickup systems, this is likely to become a larger problem.[23] End-users are currently impacted by both environmental and public-relations costs, as physical contamination from compost (for example, from landscape projects) gradually rises to the surface and enters surface waters, creating risk to terrestrial and aquatic species, and is seen both in application and result by members of the public, who believe they are applying litter to soils.

[23] End-user experience is that suppliers using a large proportion of household waste intended for compost have a larger proportion of physical contamination.

End-users have switched, to some extent, to more-finely screened (sifted) compost to meet their needs. This could result in the reduced salability of compost that is not as finely screened, or in increased average prices of compost, due to the additional screening required to make the salable product.

This requirement limiting physical contamination and film plastics is also likely to reduce medium-term and long-term maintenance costs for end-users, as soils (or nearby waterways) with fewer physical contaminants require less maintenance.

This will place additional pressure from composters (who would turn away highly contaminated input loads, based on the adopted rule amendments) on generators to clean up the organics recycling stream, benefitting both users and the environment, and benefitting composters and users through a better final product.

4.3.5.8

The adopted rule amendments require testing and reporting of compost quality variables, providing compost end-users more information on quality. Ecology believes this change will aid end-users in selecting appropriate compost products, and informing composters of what qualities end-users demand.

4.3.6 Composters – operating plans

4.3.6.1

The adopted rule amendments require facilities to keep the operating plan on site. Ecology believes there may be some benefit from being able to refer to the operating plan quickly and adhere to it.

4.3.6.2

The adopted rule amendments require the plan of operation to include a plan to manage air contamination such as odor and dust, including documenting nuisance odor complaints, and an odor management plan to deal with nuisance odors. Ecology believes this change will reduce or prevent nuisance odors, dust, and other environmental impacts on nearby populations. This prospectively reduces quality-of-life concerns and environmental justice concerns in areas neighboring composters that create odor problems. This could also help to improve public relations for the composters themselves, and save them any costs of public meetings, odor studies, legal expenses that may result from nuisance odors.

While it was not possible at this time to quantify the impacts of odor on surrounding properties and populations, Ecology notes that property value impacts due to odors can be real and significant. In a review of the literature, at the low end, Saphores and Aguilar-Benitez (2005) determined the impact of odor on property values to be 3.4 percent. For the median Washington State residential property in the last decade, the equivalent would be an impact of nearly $8,500 per typical affected property. At the

most recent statewide median housing price (2011), the equivalent would be an impact of approximately $7,600 per typical affected property.

4.3.6.3

The adopted rule amendments require facilities to include composted materials in the material handling plan. Ecology believes this will benefit both the composter and the public by requiring the composter to have plans for material handling.

4.3.6.4

The adopted rule amendments require facilities to include capacity and maximum ability to process feedstocks in the material handling plan. Ecology believes this will benefit both the composter and the public, by requiring the composter to have plans for material handling that account for the largest possible volumes of those materials. This will also benefit the environment, by preventing negative impacts of having material onsite over the capacity limit.

4.3.6.5

The adopted rule amendments require facilities to reject contaminated feedstock loads, or to plan to address contaminants and reduce physical contamination in composted material. Ecology does not believe this requirement creates benefits separable from adopted rule amendments sections requiring analysis and management of contamination, or limits on physical contamination.

4.3.6.6

The adopted rule amendments require facilities to have a plan for representative sampling. Ecology believes this change will ensure greater accuracy in testing, by using representative samples. This, in turn, will likely create more accurate and appropriate operations, planning, and reporting.

4.3.6.7

The adopted rule amendments require a description of staff training to be included in facility plans. Ecology expects this change to support planning for training, and greater efficiency in using staff with appropriate existing skills for better compost management.

4.3.7 Composters – closure

4.3.7.1

The adopted rule amendments specify that the owner or operator of a facility is financially responsible for removal of all solid wastes at closure of a composter. Ecology does not believe this is a significant change from previously existing requirements, but a clarification to state it directly. Ecology does not expect this change to create new benefits.

4.3.7.2

The adopted rule amendments specify that composted material is a solid waste if still remaining on the site at time of closure. Ecology does not believe this is a significant change from previously existing requirements, but a clarification to state it directly. Ecology does not expect this change to create new benefits.

4.3.7.3

The adopted rule amendments require facilities to plan for closure at full capacity. This change may require existing facilities to rewrite their closure plans, and will be a requirement for new facilities. Ecology believes this change may provide the benefit of an established agreement, through the closure plan, to close up to full capacity, in cases of noncompliant closure, but no additional benefit.

4.3.8 Composters – construction records

The adopted rule amendments set a limit of 30 days after completing construction to submit construction records to the jurisdictional health department and Ecology. Ecology does not expect a significant benefit from this change.

4.3.9 Other organic material handling activities

4.3.9.1

The adopted rule amendments allow imported food waste to be managed under a vermicomposting exemption. This change does not affect existing facilities in addition to the requirements for all composters that vermicomposters must also meet. This will benefit vermicomposters who would like to compost food waste as a feedstock under an exemption.

4.3.9.2

The adopted rule amendments restrict the vermicomposting exemption to processing 1,000 cubic yards. This change does not affect existing facilities in addition to the requirements for all composters that vermicomposters must also meet. This will benefit vermicomposters who would like to compost food waste as a feedstock under an exemption.

4.3.9.3

The adopted rule amendments creates a new category of exemption for other organic material handling activities managing up to 50,000 gallons of liquid wastes, or 250 cubic yards of non-liquid organic feedstocks at any time of organic feedstock on site and applies requirements for performance, pest control, odors, inspections, and notification. The adopted rule amendments also allow operations with 5,000 gallons or 25 cubic yards or less to operate without notification, reporting or testing

requirements. This change does not affect existing facilities. This will allow for future small scale transformation technologies to operate under an exemption.

4.3.10 Anaerobic digesters – conditional exemption

4.3.10.1

The adopted rule amendments add a section to the rule regulating anaerobic digesters based on requirements in RCW 70.95.330. The requirements explicitly in the statute are not subject to economic analysis (they are part of the baseline). The impact of other requirements in which Ecology had discretion is addressed below.

4.3.10.2

The adopted rule amendments define applicability of the section to anaerobic digesters other than those already regulated under WAC 173-350-330 (storage or treatment of solid wastes in surface impoundments or tanks), chapter 90.48 RCW (Water Pollution Control), and chapter 173-308 (Biosolids management). This applicability, in and of itself, does not create a new benefit.

4.3.10.3

The adopted rule amendments specify risk material (as prohibited generally by RCW 70.95.330 from anaerobic digester feedstocks) to include particular bovine matter as described in section 2.3.10 of this document. Ecology does not believe this requirement creates a new benefit, as they are already compliant (or will need to be compliant, if they are future facilities) with baseline operating standards that make it unlikely they will need to change behavior under the adopted rule amendments.

4.3.10.4

The adopted rule amendments create a new category for conditional exemption, as including all organic feedstocks in volumes up to 50,000 gallons of liquid wastes or 250 cubic yards of non-liquid organic feedstocks at any time. There are also associated conditions required for this exemption, as described in section 2.3.10 of this document. There are currently no facilities operating that would fall into this category. The adopted rule amendments also allow operations with 5,000 gallons or 25 cubic yards or less to operate without notification, reporting or testing requirements. This change does not affect existing facilities. This will allow for future small scale aerobic digesters to operate under an exemption.

The increased availability of exemptions from permitting would benefit facilities through:

- Increasing the volume or changing the content of an existing digester program, as a facility sees beneficial.
- Avoiding the costs of permitting, less any costs of complying with the requirements for conditional exemption.

- Encouraging more facilities to enter the market. That is, some facilities might start small digester programs if the adopted expansions to permit exemption are available, but would not have a program at all under the baseline.

Ecology estimated the minimum costs savings for the one facility each year to meet the permit exemption. This cost savings was based on avoided permit fees, and represents a minimum cost savings. Actual cost savings would also include the avoided costs of specific permit requirements, less the costs of complying with any conditional exemption requirements. Ecology estimated that the average avoided annual permit fee for a solid waste permit is $2,307.

Ecology believes up to 15 new future facilities (small scale anaerobic digesters; over 20 years) could have increased availability of the exemption, and potential to save the costs of permit requirements, less the costs of the conditions of exemption. Fifteen new facilities beginning to incur this annual cost savings each year would save (in present value) **$299,193** over 20 years. Again, this is the minimum likely benefit of the adopted rule amendments, and does not account for the additional cost savings of avoiding permit requirements.

In addition, the lower bound for reporting and testing would likely benefit schools and institutions with food waste, by allowing them to operate an exempt digester program without additional cost.

4.3.10.5

The adopted rule amendments set notification, inspection, pest prevention, and operational requirements identical to those of composters. Digester facilities already meet these operating standards under the baseline, and so do not create additional benefits associated with requirements specific to anaerobic digesters in the adopted rule amendments.

4.3.11 Anaerobic digesters – design standards

4.3.11.1

The adopted rule amendments require facilities to submit a construction quality assurance plan that describes monitoring, testing, and documentation procedures to be followed during construction. Ecology expects this change to benefit digester facility design through establishment of specific ways in which the facility's construction will be assured to meet construction planning standards.

4.3.11.2

The adopted rule amendments require facilities to provide all-weather roads for public access. Facilities already meet this standard under baseline waste management. Ecology does not expect this change to create new benefits.

4.3.11.3

The adopted rule amendments require facilities to design all facility elements to prevent air, soil, surface water, and groundwater contamination. Ecology believes this is also a requirement under the baseline and other environmental law governing those forms of pollution. Ecology does not expect this change to create new benefits.

4.3.11.4

The adopted rule amendments require pads to be designed to prevent contamination, damage, and degradation, as described in section 2.3.11 of this document. Facilities are already compliant with this requirement under baseline waste management. Ecology does not expect this change to create new benefits.

4.3.11.5

The adopted rule amendments require stormwater and leachate management. Facilities are already compliant with this requirement under baseline waste management. Ecology does not expect this change to create new benefits.

4.3.11.6

The adopted rule amendments require ponds to have minimum 30-mil thickness liner of geomembrane on sufficient load-bearing substrate, and at least 18-inch freestanding boards to prevent water overtopping. Ecology believes this change will support protection of the public and the environment through reduced risk of spills and leaks from ponds.

4.3.12 Anaerobic digesters – operating standards

4.3.12.1

The adopted rule amendments require operations to control air contaminants such as dust and nuisance odors, prevent attraction of vectors, and prevent migration of agricultural pests. Facilities are already compliant with this requirement under the baseline. Ecology does not expect this change to create new benefits itself.

4.3.12.2

The adopted rule amendments require use of properly trained supervisors and employees. Ecology assumed employees could be trained as part of existing regular on-the-job training, while supervisors would require training per the design specifications of the manufacturer. Ecology expects this requirement to reduce the risk of environmental contamination and air or water quality issues that affect the public wellbeing, by ensuring that supervisors have appropriate knowledge of environmentally compliant anaerobic digester procedures, and that employees have appropriate knowledge of operations, maintenance, and safety procedures at their facility.

4.3.12.3

The adopted rule amendments require digester facilities to restrict access when the facility is closed. Ecology does not believe this change will create new benefits.

4.3.12.4

The adopted rule amendments require at least weekly inspection of facilities, as needed. Ecology believes facilities are already compliant with this requirement under the baseline. Ecology does not believe this change will create new benefits.

4.3.12.5

The adopted rule amendments require recordkeeping tasks, as described in section 2.3.12 of this document. Ecology believes facilities are already compliant with this requirement under the baseline. Ecology does not believe this change will create new benefits.

4.3.12.6

The adopted rule amendments require facilities to prepare and submit an annual report containing operations information as described in section 2.3.12. Ecology believes facilities are already compliant with this requirement under the baseline. Ecology does not believe this change will create new benefits.

4.3.12.7

The adopted rule amendments require facilities that distribute digestate off site to meet testing requirements and contents standards, as described in section 2.3.12. Ecology believes facilities are already largely compliant with these requirements under the baseline, and incremental additional testing could be covered under existing panels of tests. Ecology does not believe this change will create new benefits.

4.3.12.8

The adopted rule amendments require development and keeping of an operations plan on site, including plan components as described in section 2.3.12. Ecology assumed one new facility every two years, would need to develop such a plan. Ecology expects public and environmental health to benefit from greater operational planning and preparedness on site at anaerobic digester facilities. Ecology believes there may be some benefit from having the ability to refer to the operating plan quickly, to be able to adhere to it.

4.3.13 Anaerobic digesters – closure requirements

4.3.13.1

The adopted rule amendments require development, keeping, and following a closure plan that includes at least removing all organic materials including digestate from the facility, assuming the facility is at capacity. Ecology believes facilities are largely in

compliance with this requirement under the baseline, but the capacity requirement may require facilities to rewrite closure plans. Ecology assumed that one new facility every two years would need to develop such a plan.

Ecology expects this change to improve closure plans, reducing the risk to the public and the environment of contamination, odors, or other dangers and nuisances coming from closed digesters that are not fully cleaned due to a lack of planning for the capacity at closure.

4.3.13.2

The adopted rule amendments require notification of the jurisdictional health department within 60 days of closure. Ecology does not expect this requirement to generate significant benefits relative to existing notification.

4.3.13.3

The adopted rule amendments specify that at closure the facility owner or operator is financially responsible for removing all organic materials from the facility, and for sending them to the appropriate waste handling facilities. Ecology does not believe this is a significant change from previously existing requirements, but a clarification to state it directly. Ecology does not expect this change to create new benefits.

4.3.14 Anaerobic digesters – permit application

4.3.14.1

The adopted rule amendments require facilities that are not exempt to obtain a solid waste permit from the jurisdictional health department. Ecology believes facilities are in compliance with this requirement under the baseline. Ecology does not expect this change to create new benefits.

4.3.14.2

The adopted rule amendments require (in addition to solid waste permitting requirements in chapter 173-350 WAC) permit applications to contain also specific contents as described in section 2.3.14. Ecology believes facilities are in compliance with this requirement under the baseline. Ecology does not expect this change to create new benefits.

4.3.15 Anaerobic digesters – construction records

4.3.15.1

The adopted rule amendments require that prior to operation, facilities have approval from the jurisdictional health department regarding the construction procedures' adherence to design and quality assurance plans. Ecology believes facilities are in compliance with this requirement under the baseline. Ecology does not expect this change to create new benefits.

4.3.15.2

The adopted rule amendments require that prior to operation, facilities have approval from the jurisdictional health department regarding the construction documentation and permit issuance. Ecology believes facilities are in compliance with this requirement under the baseline. Ecology does not expect this change to create new benefits.

4.3.15.3

The adopted rule amendments require facilities, within 30 days of completing construction, to provide the jurisdictional health department and Ecology with construction drawing records, and a report of facility construction and quality assurance testing results. Ecology does not believe the time limit change will create new benefits.

4.4 Expected benefits

Ecology expects the adopted rule amendments to result in a reduction in odor air-quality impacts on other parties, poor-quality compost for end-users, and some compliance costs for complying facilities. Ecology estimated total present-value benefits of the adopted rule amendments, in both quantitative and qualitative forms. Ecology quantified those values it could estimate with a high enough degree of certainty or with highly conservative assumptions to relieve uncertainty associated with less conservative assumptions. Table 2 summarizes the range of benefits Ecology estimated for the adopted rule amendments.

Table 4: Likely Benefits of the Adopted Rule Amendments

GENERAL BENEFITS
Facilitating compliance through organization and clarity.
Reducing or preventing nuisance odors to the public, and reducing property value impacts associated with odors. Odors affecting residential properties can reduce property values by at least 3.4 percent.
Providing opportunities for small composters, digesters, and agricultural operations to operate under permit exemption.
BENEFITS OF AMENDED COMPOSTER REGULATION
Reduced risk of improperly left-behind compost materials that may create nuisance odors. Reduced risks to buyers and sellers of real estate.

New permit exemptions for: • Existing composters. • One new exempt facility per year required to report to Ecology. • Numerous small composters not required to interact with Ecology. Resulting in avoided permit costs of **at least $398,924, plus avoided compliance costs**, and ability to expand operations: • New permit exemption for small compost facilities. • New permit exemption for facilities composting post-consumer food waste, pre-consumer vegetative waste, pre-consumer animal-based waste, yard debris, bulking agents, and manufactured organics. • New permit exemption for facilities composting yard debris, crop residues, manure and bedding, and bulking agents. • New permit exemption for facilities composting yard debris and bulking agents. • New permit exemption for facilities composting agricultural wastes and bulking agents.
Public health and environmental protection from notification to regulators.
More accurate reporting.
Better construction through specifications for quality assurance for facility construction.
Reduced risk to public and environmental health, and air and water quality issues that affect public wellbeing, through trained supervisors and employees.
Better planning, analysis, and reporting based on representative pile temperatures.
Increased odor control for neighboring populations.
Reduced risk to public and environmental health from molybdenum and selenium.
Better planning, analysis, and reporting based on representative compost sampling.
Facilitating compliance and flexible business practices, through establishing uniform standards for testing frequency.
Reduced physical contamination of compost products. Improved usability of compost by end-users. Reduced maintenance costs for end-users of compost. Improved public relations and long-run business support for compost producers and users.
Additional information for end-users to select compost, and composters to identify desired qualities of end-user demand.
Ability to refer to an on-site operating plan as needed.
Reduced nuisance odors, dust, and other environmental impacts on neighboring populations. Reduced quality-of-life and environmental justice concerns. Improved public relations for composters.
Improved planning including composting materials handling at the largest capacities.
Increased accuracy and appropriate operations, planning, and reporting from representative sampling plans.
Encouragement and availability of appropriate levels of regulatory oversight for construction records.
BENEFITS OF AMENDED OTHER FORMS OF ORGANICMATERIALS HANDLING
New permit exemption for vermicomposters composting food waste as a feedstock.
Allowance for vermicomposting exemption for processing up to 1,000 yards.

New category of exemption for other organic material handling activities up to 50,000 gallons of liquid wastes, or 250 cubic yards of non-liquid organic feedstocks, and exemption of operations below 5,000 gallons (or 25 cubic yards) from notification, reporting, or testing requirements.	
BENEFITS OF AMENDED ANAEROBIC DIGESTER REGULATION	
New permit exemption for facilities digesting all organic feedstocks. Resulting in avoided permit costs of **at least $299,193 plus avoided compliance costs.**	
Improved internal knowledge of digester facilities through reports, plans, and specifications for new facilities. Reduced risk to public health and the environment through reduced likelihood of operations beginning at insufficient digester facilities.	
Reduced risk of environmental contamination, and air or water quality issues that affect public wellbeing, through trained supervisors and employees.	
Improved operational planning and preparedness on site at digester facilities. Ability to refer to an on-site plan for reference in operations.	
Improved digester facility closure plans, reducing risk to the public and environment, of contamination, odors, and other dangers and nuisances coming from improperly closed digester facilities.	
TOTAL QUANTIFIABLE BENEFITS (excludes avoided compliance costs and qualitative benefits above)	**$698,117**

Prospectively, one of the most significant benefits to industry is the increased opportunity for existing and future facilities to avoid the costs of permit requirements through conditional exemptions. Existing and new composter and digester operators would have the ability to save the costs of obtaining a permit and to avoid ongoing compliance with permit requirements, and instead abide only by the conditional exemption requirements. For most of these facilities, over 20 years, there are multiple types of exemption possibly available under the adopted rule amendments that are not available under the baseline.

The likely most significant benefit to public and environmental health is likely to be reductions in odors and dust coming from existing, new future, and closed facilities. Piles would be managed in such a way as to (under plans and requirements) minimize nuisance odors and possible pathogens. Additional requirements like covers would also contribute to odor and nuisance reduction. Ecology believes this change will reduce nuisance odors, dust, and other environmental impacts on nearby populations. Ecology expects this benefit to reduce quality-of-life concerns and environmental justice concerns in areas neighboring composters. This will also help to improve public relations for the composters themselves, and save them any costs of public meetings, odor studies, legal expenses that may result from nuisance odors.

The likely most significant benefit to end-users is the likely reduction in physical contamination (especially of film plastics) of compost. Under the baseline, end-users of compost have experienced increasing quantities of physical contamination (of which a large proportion is film plastic). As municipalities across the state increasingly encourage household composting through their municipal pickup systems, this is likely to become a

larger problem.[24] End-users are currently impacted by both environmental and public-relations costs, as physical contamination from compost (for example, from landscape projects) gradually rises to the surface and enters surface waters, creating risk to terrestrial and aquatic species, and is seen both in application and result by members of the public, who believe they are applying litter to soils.

End-users have switched, to some extent, to more-finely screened (sifted) compost to meet their needs. This could result in the reduced salability of compost that is not as finely screened, or in increased average prices of compost, due to the additional screening required to make the salable product. The more uniformly sized compost, however, is likely to become more saleable, based on perceived quality and additional processing input.

The requirement limiting physical contamination and film plastics is also likely to reduce medium-term and long-term maintenance costs for end-users, as soils (or nearby waterways) with fewer physical contaminants require less maintenance.

This will place additional pressure from composters (who would turn away highly contaminated input loads, based on the adopted rule amendments) on generators to clean up the organics recycling stream, benefitting both users and the environment, and benefitting composters through a better final product.

[24] End-user experience is that suppliers using a large proportion of household waste intended for compost, have a larger proportion of physical contamination.

Chapter 5: Cost-Benefit Comparison and Conclusions

5.1 Introduction

As discussed in Chapter 1, the APA requires Ecology to evaluate significant legislative rules to "[d]etermine that the probable benefits of the rule are greater than its probable costs, taking into account both the qualitative and quantitative benefits and costs and the specific directives of the statute being implemented."

5.2 Estimated costs

As described in Chapter 3, Ecology estimated the following costs associated with the adopted rule amendments. These costs are in present-value terms, over 20 years.

Table 5: Summary Costs of the Adopted Rule Amendments

COMPOSTER COSTS	Low	High
Fees to update plans	$0	$37,185
Update plans for group 5 composters	$2,293	$10,941
Supervisor training	$191,953	$191,953
Odor plan	$23,607	$112,644
Closure plan	$590	$2,815
ANAEROBIC DIGESTER COSTS	**Low**	**High**
Operating report	$11,720	$55,924
Closure plan	$146	$697
TOTAL 20-YEAR COSTS	**$230,309**	**$412,159**

The total quantifiable present-value costs of the adopted rule amendments are approximately $230,309 – $412,159. Where prices, number of applicable facilities, or timing were uncertain, Ecology made assumptions that would overestimate costs, as to conservatively underestimate net benefits of the adopted rule amendments. Ecology received comments suggesting additional cost estimation, but did not determine additional costs were appropriate. Please see the associated Responsiveness Summary for this rulemaking.

5.3 Estimated benefits

As described in Chapter 4, Ecology estimated the following benefits associated with the adopted rule amendments. These benefits are in present value terms, over 20 years.

Table 6: Summary Benefits of the Adopted Rule Amendments

GENERAL BENEFITS
Facilitating compliance through organization and clarity.
Reducing or preventing nuisance odors to the public, and reducing property value impacts associated with odors. Odors affecting residential properties can reduce property values by at least 3.4 percent.
Providing opportunities for small composters, digesters, and agricultural operations to operate under permit exemption.
BENEFITS OF AMENDED COMPOSTER REGULATION
Reduced risk of improperly left-behind compost materials that may create nuisance odors. Reduced risks to buyers and sellers of real estate.
New permit exemptions for: • Existing composters. • One new exempt facility per year required to report to Ecology. • Numerous small composters not required to interact with Ecology. Resulting in avoided permit costs of **at least $398,924, plus avoided compliance costs**, and ability to expand operations: • New permit exemption for small compost facilities. • New permit exemption for facilities composting post-consumer food waste, pre-consumer vegetative waste, pre-consumer animal-based waste, yard debris, bulking agents, and manufactured organics. • New permit exemption for facilities composting yard debris, crop residues, manure and bedding, and bulking agents. • New permit exemption for facilities composting yard debris and bulking agents. • New permit exemption for facilities composting agricultural wastes and bulking agents.
Public health and environmental protection from notification to regulators.
More accurate reporting.
Better construction through specifications for quality assurance for facility construction.
Reduced risk to public and environmental health, and air and water quality issues that affect public wellbeing, through trained supervisors and employees.
Better planning, analysis, and reporting based on representative pile temperatures.
Increased odor control for neighboring populations.
Reduced risk to public and environmental health from molybdenum and selenium.
Better planning, analysis, and reporting based on representative compost sampling.
Facilitating compliance and flexible business practices, through establishing uniform standards for testing frequency.
Reduced physical contamination of compost products. Improved usability of compost by end-users. Reduced maintenance costs for end-users of compost. Improved public relations and long-run business support for compost producers and users.
Additional information for end-users to select compost, and composters to identify desired qualities of end-user demand.
Ability to refer to an on-site operating plan as needed.

Reduced nuisance odors, dust, and other environmental impacts on neighboring populations. Reduced quality-of-life and environmental justice concerns. Improved public relations for composters.	
Improved planning including composting materials handling at the largest capacities.	
Increased accuracy and appropriate operations, planning, and reporting from representative sampling plans.	
Encouragement and availability of appropriate levels of regulatory oversight for construction records.	
BENEFITS OF AMENDED OTHER FORMS OF ORGANICMATERIALS HANDLING	
New permit exemption for vermicomposters composting food waste as a feedstock.	
Allowance for vermicomposting exemption for processing up to 1,000 yards.	
New category of exemption for other organic material handling activities up to 50,000 gallons of liquid wastes, or 250 cubic yards of non-liquid organic feedstocks, and exemption of operations below 5,000 gallons (or 25 cubic yards) from notification, reporting, or testing requirements.	
BENEFITS OF AMENDED ANAEROBIC DIGESTER REGULATION	
New permit exemption for facilities digesting all organic feedstocks. Resulting in avoided permit costs of **at least $299,193 plus avoided compliance costs.**	
Improved internal knowledge of digester facilities through reports, plans, and specifications for new facilities. Reduced risk to public health and the environment through reduced likelihood of operations beginning at insufficient digester facilities.	
Reduced risk of environmental contamination, and air or water quality issues that affect public wellbeing, through trained supervisors and employees.	
Improved operational planning and preparedness on site at digester facilities. Ability to refer to an on-site plan for reference in operations.	
Improved digester facility closure plans, reducing risk to the public and environment, of contamination, odors, and other dangers and nuisances coming from improperly closed digester facilities.	
TOTAL QUANTIFIABLE BENEFITS (excludes avoided compliance costs and qualitative benefits above)	**$698,117**

Prospectively, one of the most significant benefits to industry is the increased opportunity for existing and future facilities to avoid the costs of permit requirements through conditional exemptions. Existing and new composter and digester operators would have the ability to save the costs of obtaining a permit and to avoid ongoing compliance with permit requirements, and instead abide only by the conditional exemption requirements. For most of these facilities, over 20 years, there are multiple types of exemption possibly available under the adopted rule amendments that are not available under the baseline.

The likely most significant benefit to public and environmental health is likely to be reductions in odors and dust coming from existing, new future, and closed facilities. Piles would be managed in such a way as to (under plans and requirements) minimize nuisance odors and possible pathogens. Additional requirements like covers would also contribute to odor and nuisance reduction. Ecology believes this change will reduce nuisance odors, dust, and other environmental impacts on nearby populations. Ecology expects this benefit to reduce quality-of-life concerns and environmental justice concerns in areas neighboring

composters. This will also help to improve public relations for the composters themselves, and save them any costs of public meetings, odor studies, legal expenses that may result from nuisance odors.

The likely most significant benefit to end-users is the likely reduction in physical contamination (especially of film plastics) of compost. Under the baseline, end-users of compost have experienced increasing quantities of physical contamination (of which a large proportion is film plastic). As municipalities across the state increasingly encourage household composting through their municipal pickup systems, this is likely to become a larger problem.[25] End-users are currently impacted by both environmental and public-relations costs, as physical contamination from compost (for example, from landscape projects) gradually rises to the surface and enters surface waters, creating risk to terrestrial and aquatic species, and is seen both in application and result by members of the public, who believe they are applying litter to soils.

End-users have switched, to some extent, to more-finely screened (sifted) compost to meet their needs. This could result in the reduced salability of compost that is not as finely screened, or in increased average prices of compost, due to the additional screening required to make the salable product. The more uniformly sized compost, however, is likely to become more saleable, based on perceived quality and additional processing input.

The requirement limiting physical contamination and film plastics is also likely to reduce medium-term and long-term maintenance costs for end-users, as soils (or nearby waterways) with fewer physical contaminants require less maintenance.

This will place additional pressure from composters (who would turn away highly contaminated input loads, based on the adopted rule amendments) on generators to clean up the organics recycling stream, benefitting both users and the environment, and benefitting composters through a better final product.

5.4 Final conclusion

Based on qualitative and quantitative assessment of the likely costs and benefits of the adopted rule amendments, Ecology concludes that there is reasonable likelihood that estimated benefits of the adopted rule amendments exceed their costs.

[25] End-user experience is that suppliers using a large proportion of household waste intended for compost, have a larger proportion of physical contamination.

Chapter 6: Least Burdensome Alternative Analysis

6.1 Introduction

RCW 34.05.328(1)(d) requires Ecology to "…[d]etermine, after considering alternative versions of the rule and the analysis required under (b) and (c) of this subsection, that the rule being adopted is the least burdensome alternative for those required to comply with it that will achieve the general goals and specific objectives stated under (a) of this subsection."

Ecology assessed alternatives to the adopted rule amendments over the course of the rulemaking, and determined whether they met the general goals and specific objectives of the authorizing statute. Of those that would meet these objectives, Ecology determined whether the adopted rule amendments were the least burdensome.

The authorizing statute is chapter 70.95 RCW. The goals of this statute, as they pertain to the rulemaking include:

- Encouraging composting and anaerobic digesters.
- Protecting public health and the environment.
- Encouraging safe and effective use of compost and digestate.

Ecology concluded that the adopted rule amendments are the least burdensome alternatives that meet these goals and objectives.

6.2 Odor-control alternatives

6.2.1 Rule content considered

A. Requiring a cover for aerated static piles.
B. Requiring management of composted material piles.
C. Requiring an expanded odor management plan.
D. Requiring an odor mitigation fee.
E. Requiring ongoing air pollutant monitoring.
F. Requiring all organic processing to occur in an enclosed building.
G. Specifying a number of complaints that would trigger an odor violation.
H. Creating a tiered system of permits based on volume of material processed and putrescibility of feedstocks, with greater engineering controls required for larger facilities or more odiferous feedstocks. Engineering controls might include an enclosed tip building, aeration systems with biofilters, controlling temperature and acidity, or others.
I. No action.

6.2.2 Context for each alternative in section 6.2.1

A. Odors are released from uncovered, positively aerated static piles.
B. Stockpiles of composted materials can release odors.

C. Without specific requirements, some odor management plans are insufficient to prompt action or changes, when responding to odor issues.
D. Health districts do not have adequate funds to pursue odor violations.
E. Most facilities don't regularly monitor emissions, so there is no data base of what emissions and impacts facilities have on a community.
F. Open air composting is likely to release odors.
G. Multiple complaints about the same facility can be tracked, but unless they are verified in some manner, often no action is taken to mitigate odors.
H. Most odor complaints have occurred at larger facilities and those handling more grass, food waste, or chicken manure (all highly putrescible and odiferous feedstocks).
I. Decomposing organic matter releases odors, so compost facilities can be odor sources. Ecology has a statutory responsibility to protect human health (from noxious compounds in emissions) and uphold the Clean Air Act both directly and through rulemaking.

6.2.3 Effectiveness of each alternative in section 6.2.1

A. Requiring a cover on aerated static piles mirrors other regulations to ensure pathogen reduction. The cover will also help prevent vector attraction, and will reduce the release of odors as it acts like a biofilter.
B. Continued management of composted materials will reduce odor generation through maintaining porosity and moisture levels in the pile.
C. The odor management plan requirements include planning for changes that can be made in response to odor complaints.
D. Health districts would collect additional fees to help train staff to provide technical assistance and enforcement.
E. Regular emissions monitoring would help create a database of unique facility emissions that could be used to establish odor thresholds at the property line, and inform processing decisions.
F. Enclosing the entire composting facility would help reduce odors as all process air can be treated.
G. Establishing a number of complaints to trigger enforcement would force facilities to respond more quickly to odor issues.
H. Targeting larger facilities and those handling more putrescible feedstocks for greater control technologies would allow the smaller and simpler facilities to operate without substantial investment.
I. The previous rule states that the facility must be operated in a manner that controls nuisance odors and other contaminants to prevent migration beyond the property boundary.

6.2.4 Why Ecology did not propose some alternatives in section

A. Alternative A is in the adopted rule amendments.
B. Alternative B is in the adopted rule amendments.
C. Alternative C is in the adopted rule amendments.

D. Most facilities have an air permit (and pay the associated permit fee), in addition to a solid waste permit. Paying additional fees for regulating emissions under the solid waste permit is an unreasonable financial burden. This alternative is more burdensome.
E. Regular emission monitoring is very expensive. Ecology is currently pursuing a study to determine the best way of tracking and quantifying emissions. Until that is determined, Ecology chose not to require emissions monitoring and its associated burden. This alternative is more burdensome.
F. Requiring an enclosed building is prohibitively expensive for many composters. This alternative is more burdensome.
G. Nuisance odor complaints are not always accurate, as odors may result from multiple sources. This is an imprecise way to institute enforcement. This alternative does not confidently achieve the goals and objectives of the authorizing statute.
H. While many technologies are currently used in industry to abate odors, the data shows no clearly superior system. Ecology would, therefore, be mandating potentially costly upgrades that have uncertain degrees of effectiveness (much less could not be determined to be the best technology). Additionally, no hard data could be found to show at what threshold facilities become large enough to regularly cause odor complaints, and not all larger facilities or those with putrescible feedstocks have had odor complaints, so creating a tiered system could be to some degree arbitrary. This alternative does not confidently achieve the goals and objectives of the authorizing statute.
I. Nuisance odors are a primary hurdle to the future of composting and other organics recycling in Washington State. Despite attempts to limit nuisance odors under the previously existing rule language, odor complaints continue to increase. This alternative does not achieve the goals and objectives of the authorizing statute.

6.3 Contamination reduction alternatives

6.3.1 Rule content considered

A. Limit the acceptable weight of film plastics in finished compost.
B. Require facilities to reject contaminated feedstock loads or have a plan for accepting contaminated loads, but keeping them separate from clean loads, and cleaning them to an acceptable level.
C. Limit the amount of visual contamination in finished compost based on the surface area of physical contaminants in a given area.
D. No action.

6.3.2 Context for each alternative in section 6.3.1

A. Limiting lightweight film plastics does not adequately account for the quantity of film plastics, precisely because they are lightweight. Composted material could meet the previously existing standard while still significantly contributing to the litter when compost is applied roadside or at a stream bank. The plastics can blow into water, impacting fish-bearing streams and other waters of the state.

B. Based on their contracts, some facilities are obligated to accept all incoming organic loads, regardless of contamination. This inherently impacts the quality of composted material.
C. Visual contamination in finished compost is generally lightweight plastic. This is the material that blows around as litter.
D. Contamination in the form of non-compostable plastics, textiles, foil, dishes, and other material has increased dramatically in recent years. This material is making its way into finished product, and is being distributed to the public and private sectors of end-users. This results in the distribution of litter and site contamination in some cases.

6.3.3 Effectiveness of each alternative in section 6.3.1

A. Creating a separate weight standard for lightweight film plastics reduces the acceptable level of plastics in composted material and will result in a cleaner product.
B. Rejecting contaminated loads will put pressure on the generators of feedstocks to clean the loads before delivering them to compost facilities. This will lighten the burden on facilities to meet the new standards, and help produce a cleaner composted material. If facilities want to take all incoming loads, they must have a plan in place to separate contaminated loads from clean loads, and to clean the contaminated loads to an acceptable level before composting with other materials. This will reduce the amount and spread of physical contaminants.
C. Requiring facilities to inspect composted material for visible contamination, before distributing compost off site would force them to deliver cleaner loads of composted material to their customers.
D. The baseline requires testing to demonstrate that finished material contains less than one percent inert (non-compostable) matter.

6.3.4 Why Ecology did not propose some alternatives in section

A. Alternative A is in the adopted rule amendments.
B. Alternative B is in the adopted rule amendments.
C. Limiting the amount of contaminants based on surface area of contamination in a given area is a difficult standard to enforce. The consistency of the results depends on the clarity of the required steps to measure visual contamination, and on the integrity of the technician. Ecology also recognizes that some markets may exist for composted material that meets the physical contamination standards, but has higher levels of visual contamination. This alternative does not confidently achieve the goals and objectives of the authorizing statute.
D. Ecology has a responsibility to facilitate the future distribution of clean composts by addressing the growing trend of contamination entering feedstocks and final compost product. This alternative does not achieve the goals and objectives of the authorizing statute.

6.4 Water quality protection alternatives

6.4.1 Rule content considered

A. Require all materials on site, including composted materials, to be managed to reduce the impacts from stormwater runoff.
B. Specify how lagoon liners are to be inspected.
C. No action.

6.4.2 Context for each alternative in section 6.4.1

A. Composted materials meeting the testing standards of the baseline are not considered solid waste, and therefore are not managed to control runoff. Stockpiles of composted material may become waterlogged and go anaerobic. The resulting runoff may contribute to both surface water and groundwater contamination.
B. Without specified inspection requirements, some leaks may go undetected, contributing to groundwater contamination.
C. Ecology has a mandate to uphold the Clean Water Act and ensure that solid waste handling facilities do not contribute to water pollution.

6.4.3 Effectiveness of each alternative in section 6.4.1

A. Requiring composted material to be managed to control runoff will reduce the impacts to surface water and groundwater.
B. Requiring a visual inspection or electrical leak detection will help detect leaks and avoid contributing to groundwater contamination.
C. The previous rule requires that all leachate from active composting be diverted from stormwater and collected in a leachate pond or tank.

6.4.4 Why Ecology did not propose some alternatives in section

A. Alternative A is in the adopted rule amendments.
B. Alternative B is in the adopted rule amendments.
C. Ecology is concerned that large piles of stockpiled compost may be producing leachate that has the potential to impact surface water and groundwater, and that leachate ponds may fail and go undetected without periodic visual inspection. This alternative does not achieve the goals and objectives of the authorizing statute.

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