Nailah Shami

From: Edward Wheeler <edward@lenz-enterprises.com>
Sent: Tuesday, February 19, 2019 2:47 PM
To: Notice Of Construction
Cc: Jason Lenz
Subject: Lenz Enterprises Inc. NOC No. 10494 Permit Modification Application
Attachments: Cover Letter PSCAA APP_2019.pdf; PSCAA Lenz NOC.pdf; DNS 16-112922-CUP Lenz Enterprises.pdf; Lenz EngRpt Final.pdf; LENZ_COMPOST_POO_150k_2019.pdf; LCF_CPOMP_2019_Update.pdf; Lenz Permit Modification Application_PSCAA_2018.pdf; PSCAA SEPA Checklist.pdf

Dear Permit Coordinator,

Please find attached applications and supporting documentation for proposed modifications to the Lenz Enterprises Inc. NOC 10494. Let me know if you have any questions or comments on this submission.

Thank you.

Edward Wheeler
Program Director | **Lenz Enterprises, Inc.**
P.O. Box 868 | 5210 SR 532 | Stanwood, WA 98292
360.629.2933 - ext. 1006 (o) | 360.629.6213 (f) | 360.333.0516 (m)
edward@lenz-enterprises.com | www.lenz-enterprises.com | www.greenblenz.com

Snohomish County
Planning and Development Services

Dave Somers
County Executive

Barb Mock, Planning Director
3000 Rockefeller Avenue M/S #604
Everett, WA 98201-4046
(425) 388-3311 FAX (425) 388-3832

DETERMINATION OF NONSIGNIFICANCE

Local File Number: 16-112922 CUP **Project File Name:** Lenz Enterprises Mineral Extraction

Applicant: Lenz Enterprises

DESCRIPTION OF PROPOSAL:
New conditional use permit to expand existing conditional use permit approved under PDS file ZA8702073, to align with the existing Mineral Resource Overlay designation within the county's comprehensive plan. The proposal will expand the area covered by the existing conditional use permit from 54 acres to 108 acres; all of the area proposed for the expanded conditional use permit is zoned R-5.

An evaluation of the information submitted with the application coupled with an on-site investigation has resulted in a determination that the application complies with Chapter 30.62A SCC (Wetlands and Fish & Wildlife Habitat Conservation Areas) and is consistent with the purpose and objectives of the chapter in regulation of development activities in critical areas to safeguard the public health, safety and welfare.

Location of Proposal: 5210 State Route 532, Stanwood, Washington

Tax Account Numbers: 320428-001-005-00, 320428-001-008-00, 320428-002-002-00, 320428-002-007-00

Lead Agency: Snohomish County Planning and Development Services

THRESHOLD DETERMINATION:

The lead agency for this proposal has determined that it does not have a probable, significant adverse impact on the environment. An environmental impact statement (EIS) is NOT required under RCW 43.21C.030(2)(c). This decision was made after review by Snohomish County of a completed environmental checklist and other information on file with this agency and such information is adopted herein by reference. This information is available for public review upon request.

The lead agency has determined that the requirements for environmental analysis, protection, and mitigation measures have been adequately addressed in the development regulations and comprehensive plan adopted under chapter 36.70A RCW, and in other applicable local, state, or federal laws or rules, as provided by RCW 43.21C.240 and WAC 197-11-158. Our agency will not require any additional mitigation measures under SEPA.

This Determination of Nonsignificance is issued under WAC 197-11-340 (2) and is subject to a 14 day comment period. Written comments may be submitted to the lead agency at the address below. Comments must be received by **April 25, 2018.**

APPEALS:

This DNS may be appealed pursuant to the requirements of Section 30.61.300 SCC and Chapter 2.02 SCC. The fourteen (14) day appeal period commences on the date of publication of notice. Any appeal must be addressed to the County Hearing Examiner, accompanied by a filing fee of $500.00, and be filed in writing at the Customer Support Center on the 2nd Floor, County Administration Building East, Everett, WA. The appeal must be received by **April 25, 2018**. The appeal must contain the items set forth in 30.71.050(5) SCC as follows:

(a) Facts demonstrating that the person is aggrieved by the decision;

(b) A concise statement identifying each alleged inadequacy in the threshold determination;

(c) The specific relief requested; and

(d) Any other information reasonably necessary to make a decision on appeal.

Please note that failure to file a timely and complete appeal including all the above items shall constitute waiver of all rights to an administrative appeal under county code. In addition to the above requirements, SCC 30.61.305(1) also requires that any person filing an appeal of a threshold determination made pursuant to this chapter shall file with the hearing examiner, within seven days of filing the appeal, a sworn affidavit or declaration demonstrating facts and evidence, that, if proven, would demonstrate that the issuance of the threshold determination was clearly erroneous.

Contact Person:	Tom Barnett, Project Manager
Responsible Official:	Barb Mock, Planning Director Planning and Development Services
Address:	County Administration Building East, 2nd Floor 3000 Rockefeller Avenue, M/S 604 Everett, Washington 98201

Signature: _____ **Date:** 4/2/18

Ryan Countryman for Responsible Official

Date Issued: April 11, 2018 - tbarnett / MRC

VOLUNTARY OFFERS:

This threshold determination was reached on the basis of mitigation offered voluntarily by the developer. The voluntary offers submitted were evaluated as part of this threshold determination, and are considered necessary to reduce the overall level of impact below that which is probable, significant and adverse.

DISCLAIMER:

The determination that an environmental impact statement does not have to be filed does not mean there will be no adverse environmental impacts. Snohomish County codes governing noise control, land use performance standards, construction and improvement of county roads, off site road improvement obligations, drainage control, fire protection and building practices will provide substantial mitigation of the aforementioned impacts.

The issuance of this Determination of Nonsignificance should not be interpreted as acceptance or approval of this proposal as presented. Snohomish County reserves the right to deny or approve said proposal subject to conditions if it is determined to be in the best interest of the county and/or necessary for the general health, safety and welfare of the public to do so.

DISTRIBUTION LIST:

Snohomish County	Department of Public Works, Environmental Services North County Fire / EMS Snohomish Health District
Washington State	Department of Ecology Department of Transportation Department of Natural Resources
Utilities	Public Utility District #1 of Snohomish County
Other Agencies	Stanwood-Camano School District No. 401 City of Stanwood
Adjacent Property Owners	Notice of the issuance of this Determination of Nonsignificance has been mailed to property owners of record within 1000 feet of the external boundaries of this project.

ATTACHMENTS

1. Environmental Checklist
2. Vicinity Map
3. Ownership & Zoning Map
4. Site Plan

Lenz Sand and Gravel Mine
Conditional Use Permit
Snohomish County, Washington

State Environmental Policy Act (SEPA) Checklist

Submitted:
May 2017

To Snohomish County Planning and Development Services

Prepared by:
Lenz Enterprises, Inc.
PO Box 848
Stanwood, WA 98292

A. BACKGROUND

1. **Name of proposed project, if applicable:** Lenz Enterprises Inc. Sand and Gravel Mine

2. **Name of applicant:** Lenz Enterprises Inc.

3. **Address and phone number of applicant and contact person:** PO Box 868 Stanwood WA 98292 (360) 629-2933

4. **Date checklist prepared:** May 2017

5. **Agency requesting checklist:** Snohomish County

6. **Proposed timing or schedule (including phasing, if applicable):** This SEPA checklist has been prepared to accompany a Conditional Use Permit application for an existing sand and gravel surface mine. Operations are on-going. Surface mining will continue over the next 30 years based on market demand.

7. **Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.**

   Yes. Lenz Enterprises plans to permit parcels immediately adjacent to the eastern site boundary and the MRO for Wood Waste Recycling operations. This potential proposal will be related to current recycling activities on the permitted Lenz Sand and Gravel surface mine site but will not be mining related. Timing for this activity has not yet been determined.

8. **List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.**

   In addition to this SEPA Checklist the following documents have been prepared: draft surface mining reclamation plan; stormwater plan; geotechnical engineering report, site critical areas assessment; site maps and graphics; seasonal high groundwater study, site traffic summary, mining operation plan and Department of Natural Resources (DNR) SM-6 and SM-8 forms.

9. **Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.**

   No applications are pending for governmental approvals of other proposals directly affecting the property covered by this proposal.

10. **List any government approvals or permits that will be needed for your proposal, if known.**

    An approval for surface mining is required by the Washington DNR and Snohomish County (Forms SM-8 and SM-6 respectively).

11. **Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)**

    Lenz Enterprises, Inc. is submitting documentation to Snohomish County for a Conditional Use Permit (CUP) for the Lenz Sand and Gravel Mine (LSGM) near Stanwood Washington. Lenz Enterprises is proposing that the existing CUP approved under PDS file ZA8702073, for the Lenz Sand and Gravel mine, be expanded to include the area outside of the existing Mineral Conservation (MC) zoned

property, which currently is zoned R-5 and designated Mineral Resource Overlay (MRO) in the county's comprehensive plan. Proposed changes to existing CUP authorizations include:

- Lenz Enterprises proposes expansion of current CUP authorizations to the extent of the Mineral Resource Overlay in Snohomish County parcels 32042800200200, 32042800200700, 32042800100500, and 32042800100800 (See Site Plan).
- Lenz Enterprises proposes to define mining depth to an elevation of 100' AMSL or to an elevation that assures a minimum of 10-feet separation from the pit floor and the Seasonal High Groundwater level as defined by an existing onsite well (Piezometer) and a Snohomish County approved groundwater monitoring plan.
- Lenz is proposing county approved 50-foot buffer widths for all property boundaries.

Four property parcels make up the Snohomish County MRO in this area and include parcels 32042800200200, 32042800200700, 32042800100500, and 32042800100800 totaling approximately 108 acres. All parcels are owned by Lenz Enterprises, Inc. All parcels are within the MRO but only portions are currently zoned Mineral Conservation and are actively mined. All parcels are owned by Lenz Enterprises, Inc. Expansion of the MC Zone will not result in increased daily production or types of activity; rather, the same activities and rates of extraction will continue at the site but will include access to additional mineral resources over time.

The existing CUP (No. CU 41-76 and all associated conditional use amendments) for the mine describes surface mine operating conditions for the Lenz Sand and Gravel Mine which has operated on the site since the 1970's. This proposal includes expanding all operations, conditions, and approvals of existing CUP 41-6 (and all associated conditional use amendments) to the identified Mineral Resource Overlay (MRO) area.

This proposal will help meet Snohomish County and site goals to "conserve mineral resource lands for mineral extraction, minimize the detrimental effects of mineral extraction on the environment and other land uses and plan for the eventual post-extractive use of mine sites" (Snohomish County General Policy Plan, December 21, 2013).

12. **Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.**

The address of the site is 5210 State Route 532, Stanwood Washington 98292. The site is located approximately 1.5 miles east of Stanwood in northern Snohomish County. Site Coordinates: Latitude: 48° 27' 13.21"; Longitude: -122° 18' 14.11".

B. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site
(circle one): Flat, rolling, hilly, steep slopes, mountainous,
other _____

The site is flat with the exception of the southwest corner of the site which is being actively mined for sand and gravel resources and the northeast corner of the site which is vegetated and rises in elevation slightly from the rest of the site. The majority of the area is a flat terrace surrounded by relatively steep slopes to the south.

b. What is the steepest slope on the site (approximate percent slope)?

The steepest slope on the site is approximately a 75 percent grade. This steep grade is located in the active mining area and is a result of active surface mining. The remainder of the site is relatively flat.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

The USDA Natural Resources Conservation Service (NRCS) on-line Web Soil Survey identifies site soils as consisting of 77 Tokul-Winston gravelly loams, 80 Winston gravelly loam, and 51 Pits. These soils are not classified as agricultural soils.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

No, there are no surface indications or history of unstable soils in the immediate vicinity.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.

Mineral resource extraction of sand and gravel, with subsequent backfilling, is occurring and it is proposed to continue on approximately 15 acres in the southwest corner of parcel 32042800200700. Approximate quantities of mineral resources remaining in this area have been calculated at 500,000 cubic yards. Upon approval of this proposal, approximately eight acres in the northeast corner of parcel 32042800100500 is proposed for mineral resource extraction. Approximate quantities of mineral resources in this area have been calculated at approximately 500,000 cubic yards. Final grades in the northeast corner of parcel 32042800100500 will be one to two percent sloped to the southwest to maintain suitable drainage and continuity with surrounding topography and to facilitate post-mining activities. Final reclamation contours in the southwest corner of parcel 32042800200700 will be achieved by backfilling areas where mineral resource extraction has been completed and similar slopes will be achieved. It is estimated that approximately 1×10^6 cubic yards of material will be imported over the life of the operation to reclaim extraction areas. Backfilling will occur contemporaneously with site extraction operations. All grading and backfilling will be performed with imported non-noxious, noncombustible, and relatively incompatible solids and per county and DNR regulations.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

No erosion could occur as a result or clearing, construction, or use. The majority of the site has been cleared for many years and no construction is proposed. Mineral extraction will occur per DNR and other state rules, regulations and standards.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

Minor impervious surfacing may occur to support sand and gravel mining and ancillary site uses. Existing impervious surface totals approximately six acres. Approximately 10-15 percent of the site will be covered with impervious surfaces after project construction.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

A Washington State Department of Ecology approved Stormwater Pollution Prevention Plan (SWPPP) that includes suggested Best Management Practices (BMP), is in use at the site to

mitigate any potential erosion or earth impacts. This process is regulated by the Washington State Department of Ecology and Snohomish County.

2. Air

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.

Potential sources of air emissions at the site include: dust from the extraction and movement of earth materials; on-site processing equipment (e.g. loaders, grinders) and stationary engines (e.g. generators), which generate emissions from internal combustion engines using diesel fuel; and potential air emissions from the onsite commercial compost facility. Approximate quantities of all potential emission can vary significantly. Approximate quantities of on-site processing and stationary equipment vary with the rate of mineral resource extraction. Potential air emissions from the onsite commercial compost facility vary with the amount of organic residuals delivered to the site for processing.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

No, there are not off-site sources of emissions or odor that may affect the proposal.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

Mitigating Measures for mineral extraction and potential dust sources include:

- maintaining adequate moisture content of materials during mixing and screening;
- maintaining good housekeeping practices;
- limiting mixing operations during periods of high wind; and,
- continually monitoring and updating site procedures and practices to enhance operations.

Internal Combustion Engine Emissions Mitigating Measures:

Lenz primarily uses vehicles that meet or exceed 2010 EPA federal diesel or compressed natural gas emission standards for the movement and transportation of product. These vehicles include diesel particulate filters (DPF), selective catalytic reduction (SCR) systems, and greater fuel efficiency which result in less fuel consumption and lower emissions per gallon of fuel used. Standards for these vehicles reduce operating emissions to 0.2 gram per brake horsepower hour (g/bhp-hr) for NOX and 0.01 g/bhp-hr for particulate. In addition, Lenz utilizes low-rolling resistance tires, aerodynamic vehicle devices and lubricating oils formulated with lower sulfated ash, phosphorus and sulfur levels wherever possible to further reduce fuel consumption and vehicle emissions.

Composting System Mitigating Measures:

Lenz utilizes a modified Aerated Static Pile (ASP) method of composting which significantly reduces the potential for air emissions from the composting process. Lenz also utilizes air capture and biofiltration technologies to mitigate air emissions if generated.

3. **Water**

a. Surface Water:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

A constructed infiltration pond is located in the Southwest corner of the Lenz Mine. This pond is used to infiltrate stormwater that is collected on site per Washington State standards.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.
No. the project does not require work over, or adjacent to surface waters.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.
No fill or dredged material will be placed in or removed from surface waters or wetlands.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.
No, the proposal will not require surface water withdrawals or diversions.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.
No, the proposal does not lie within the 100-year floodplain.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.
No, the proposal does not involve any discharges of waste materials to surface waters.

b. Ground Water:

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.
Groundwater is, and will continue to be, withdrawn from an approved Class B groundwater well for drinking water and other potable uses. Uses include drinking water, wash sinks, and cleaning. The well is approximately 130 feet in depth. Approximate quantities withdrawn from the well are estimated at approximately 2,000 gallons per day. No water is discharged directly to groundwater

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.
Domestic sewage from a septic tank serving approximately 10 people is currently in use at the site and discharges into the ground.

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.
No stormwater runoff occurs from the site. Stormwater is contained, collected and infiltrated on site. The majority of stormwater is directed to the constructed infiltration pond in the southwest corner of the property. The compost facility is located on five acres where all stormwater is captured collected and used for the composting process. No stormwater captured on the compost facility leaves the composting site.

2) Could waste materials enter ground or surface waters? If so, generally describe.

No, waste material cannot enter ground or surface waters. All site activities include BMPs to mitigate any potential issues.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.

No, the proposal does not alter or otherwise affect drainage patterns in the vicinity of the site.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any:

The site is operated and maintained per conditions of the Washington State Sand and Gravel General Permit. Best management practices are employed at the site per the state approved Stormwater Prevention Pollution Plan.

4. **Plants**

a. Check the types of vegetation found on the site:

_X__ deciduous tree: alder, maple, aspen, other
_X__ evergreen tree: fir, cedar, pine, other
_X__ shrubs
_X__ grass
_____ pasture
_____ crop or grain
_____ Orchards, vineyards or other permanent crops.
_X__ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
_____ water plants: water lily, eelgrass, milfoil, other
_____ other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

Trees and understory in the northeast corner of the site may be removed or altered to access mineral resources. The kind and amount will depend upon mineral resource identification and market conditions but will typically include deciduous trees and general understory.

c. List threatened and endangered species known to be on or near the site.

No threatened or endangered species are known to be on or near the site.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

No landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site are proposed.

e. List all noxious weeds and invasive species known to be on or near the site.

No noxious weeds or invasive species are known to be on or near the site.

5. **Animals**

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site. Examples include:

birds: hawk, heron, eagle, songbirds, other:

mammals: deer, bear, elk, beaver, other:
fish: bass, salmon, trout, herring, shellfish, other _____

Birds and animals that have been observed on or near the site include:

- Hawk, Eagle, Songbirds, Deer, Coyote

b. List any threatened and endangered species known to be on or near the site.

No threatened or endangered species known to be on or near the site.

c. Is the site part of a migration route? If so, explain.

No the site is not part of a migration route

d. Proposed measures to preserve or enhance wildlife, if any:

No measures to preserve or enhance wildlife are proposed.

e. List any invasive animal species known to be on or near the site.

No invasive animal species are known to be on or near the site.

6. **Energy and natural resources**

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

Electricity is, and will continue to be, used for lighting, offices, heating and ancillary uses on site.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

No, proposed activity will not affect potential use of solar energy by adjacent properties.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

No additional energy conservation features beyond those already occurring on site are proposed. Site operation and management plans focus on efficient processes. Lenz conducts a LEAN Energy Efficiency Evaluation on a regular basis, using guidelines from the EPA LEAN, Energy and Climate Toolkit, to evaluate site processes. The goal of the annual evaluation is to:

- Reduce operating and maintenance costs
- Reduce vulnerability to energy and fuel price increases
- Enhance productivity
- Improve environmental quality
- Reduce greenhouse gas emissions

7. **Environmental health**

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

1) Describe any known or possible contamination at the site from present or past uses.

No contamination is known to occur on the site from present or past uses.

2) Describe existing hazardous chemicals/conditions that might affect project development and

design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.
No hazardous chemicals or conditions are known to occur on site that might affect the project devolvement or design.

Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.
Toxic or hazardous chemicals stored or used on site include:

- Petroleum Products: Motor oil and hydraulic oil are delivered to the Lenz Enterprises site in bulk and stored in 30-50 gallon tanks in the shop building. The tank area is enclosed and includes concrete containment with curbing.
- Antifreeze is stored on site in a covered containment area next to the maintenance shop in 50-gallon containers.
- The site includes a bulk fuel storage area that includes diesel in double-walled tanks.
- A 100-gallon fuel tank is installed on a pick-up truck for mobile fueling.
- Multiple 5-gallon gasoline cans are stored in the shop containment area.

3) Describe special emergency services that might be required.
No emergency services are expected to be required.

4) Proposed measures to reduce or control environmental health hazards, if any:
No measures to reduce or control environmental health hazards are proposed.

b. **Noise**

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?
No noise sources exist in the area that will affect proposed activities.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.
No significant changes in current noise levels will be created by or associated with proposed activities. Current operations meet Snohomish County noise ordinance requirements and no issues or complaints have been received. Noise associated with surface mine excavation equipment including: loaders, excavators and haul tricks will occur. Noise associated with organics and wood recycling equipment including grinding and screening will occur.

3) Proposed measures to reduce or control noise impacts, if any:
No measures to reduce or control noise sources are proposed.

8. **Land and shoreline use**

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.
The site is used for mineral extraction, materials recycling and composting. Surrounding site uses include agricultural and rural residential. The proposal will not affect current land uses on nearby or adjacent properties.

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how

many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?

No, the site has not be used as working farmland or working forest. No conversion of land use will occur as a result of this proposal.

Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how:

No, the proposal will not be affected by surrounding working farm or forest land normal business operations.

c. Describe any structures on the site.

Existing site structures include:

- Office building (1380 ft2)
- Mechanical Shop (1600 ft2)
- Compost Receiving Building (10,000 ft2)
- Commercial Compost System (30,000 ft2)

d. Will any structures be demolished? If so, what?

No structures will be demolished as a result of proposed activities.

e. What is the current zoning classification of the site?

The site has underlying zoning of both Rural 5-Acre (R-5) and Mineral Conservation (MC) and the comprehensive plan designation for the site is Mineral Resource Overlay (MRO).

f. What is the current comprehensive plan designation of the site?

The current Snohomish County Comprehensive Plan designates the property as Mineral Resource Overlay. As mentioned above the site has an underlying zoning of both R-5 and MC.

g. If applicable, what is the current shoreline master program designation of the site?

The site is not within a Snohomish County Shoreline Master Program (SMP) regulated area and, therefore, does not include a SMP designation.

h. Has any part of the site been classified as a critical area by the city or county? If so, specify.

No part of the site has been classified as an environmentally sensitive area.

i. Approximately how many people would reside or work in the completed project?

Approximately 50 people work on the site. No people reside on site. These numbers are not expected to change with the proposal.

j. Approximately how many people would the completed project displace?

No people would be displaced as a results on the project.

k. Proposed measures to avoid or reduce displacement impacts, if any:

No measures to avoid or reduce displacement impacts are proposed.

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

No change to the type of approved and permitted activities currently occurring on site are proposed; therefore no measures to ensure compatibility with existing and projected land uses and plans are proposed.

m. Proposed measures to ensure the proposal is compatible with nearby agricultural and forest lands of long-term commercial significance, if any:

No measures are proposed to ensure the proposal is compatible with nearby agricultural and forest lands.

9. **Housing**

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

Housing is not a component of this proposal.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

No units will be eliminated.

c. Proposed measures to reduce or control housing impacts, if any:

None identified.

10. **Aesthetics**

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

No structures are proposed.

b. What views in the immediate vicinity would be altered or obstructed?

No views in the immediate vicinity will be altered or obstructed.

c. Proposed measures to reduce or control aesthetic impacts, if any:

No measures to reduce or control aesthetic impacts are proposed.

11. **Light and glare**

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

No types of light or glare will result from the proposed activity.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

No, light or glare from the finished project will not be a safety hazard or interfere with any view.

c. What existing off-site sources of light or glare may affect your proposal?

No existing off-site sources of light or glare will affect the proposal.

d. Proposed measures to reduce or control light and glare impacts, if any:

No measures are proposed to reduce or control light and glare.

12. **Recreation**

a. What designated and informal recreational opportunities are in the immediate vicinity?

No recreational opportunities exist in the immediate vicinity.

b. Would the proposed project displace any existing recreational uses? If so, describe.

No, the proposed activity will not displace any existing recreational uses.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

No, measures are proposed to reduce or control impacts on recreation.

13. **Historic and cultural preservation**

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers located on or near the site? If so, specifically describe.

No, there are no buildings, structures, or sites, located on or near the site that are over 45 years old or are on, or proposed for, national, state, or local preservation registers.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

There are no landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site.

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.

No cultural or historic resources exist on or near the project site

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

No, measures are proposed to avoid, minimize, or compensate for loss, changes to, and disturbance to resources.

14. **Transportation**

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.

The site is adjacent to and has access and entrance from State Route 532, approximately three miles west of Interstate-5.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?

The site is not served by public transportation. The nearest transit stop is 1.2 miles away from the site at 72nd Avenue NW and 365th Street NW.

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate?

No parking spaces are proposed nor will the proposal eliminate any parking spaces.

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).

No new roads or streets, or improvements to existing roads or streets, are proposed.

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

The project will not use, or occur in the immediate vicinity of water, rail, or air transportation.

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?

No additional vehicular trips above those already occurring will be generated by the completed proposal.

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

No, the proposal will not interfere with, affect or be affected by the movement of agricultural or forest products on roads of streets in the area.

h. Proposed measures to reduce or control transportation impacts, if any:

Long-term operational and management strategies have been developed to maximize the volume of material transported per trip. Lenz pursues contracts that will achieve these strategies which reduce and control transportation impacts.

15. **Public services**

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

The proposal will not result in increased need for public services.

b. Proposed measures to reduce or control direct impacts on public services, if any.

No measures to reduce or control impacts on public services are proposed.

16. **Utilities**

a. Circle utilities currently available at the site:
electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other _____

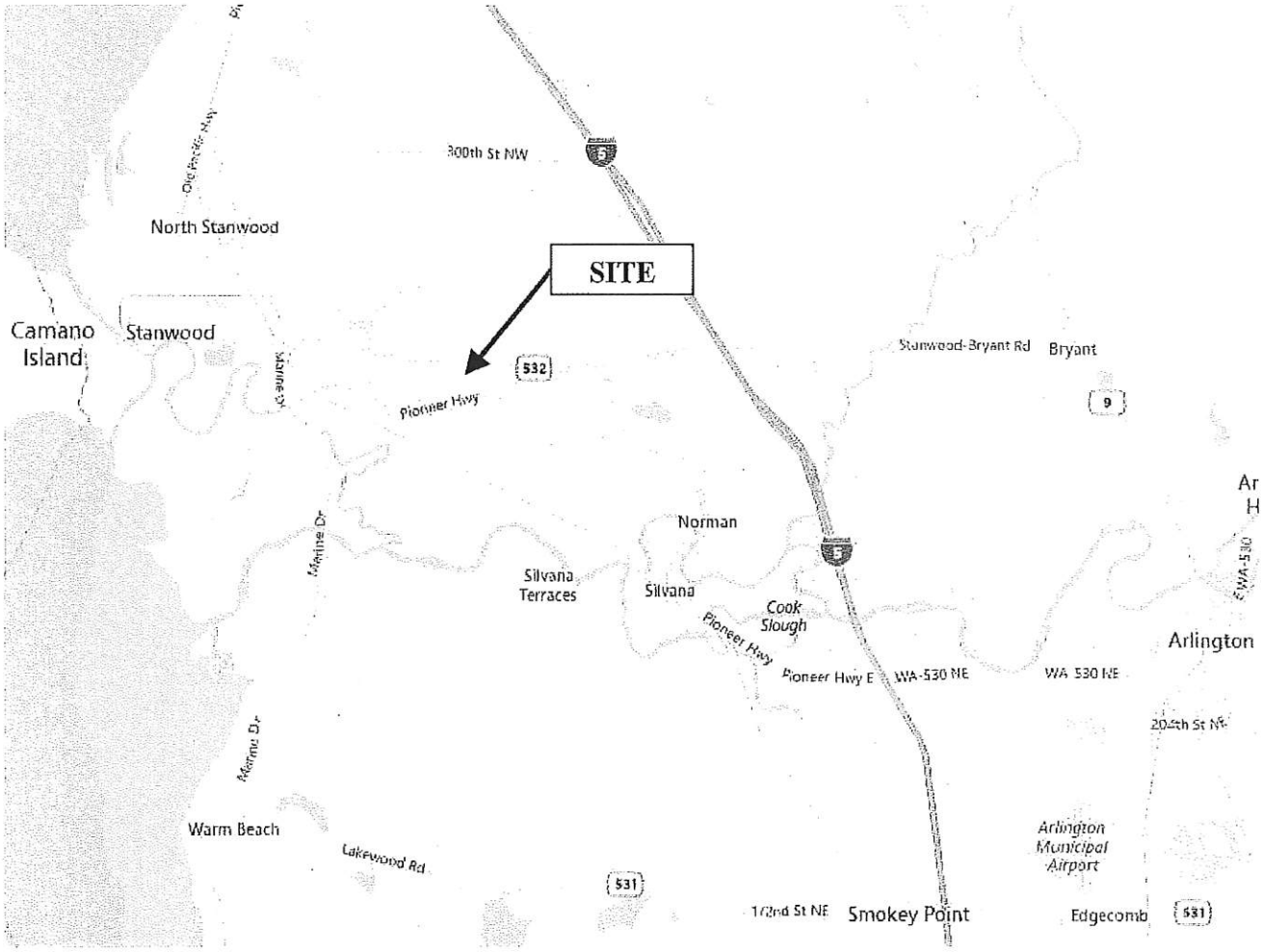
b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

No utilities are proposed for the project.

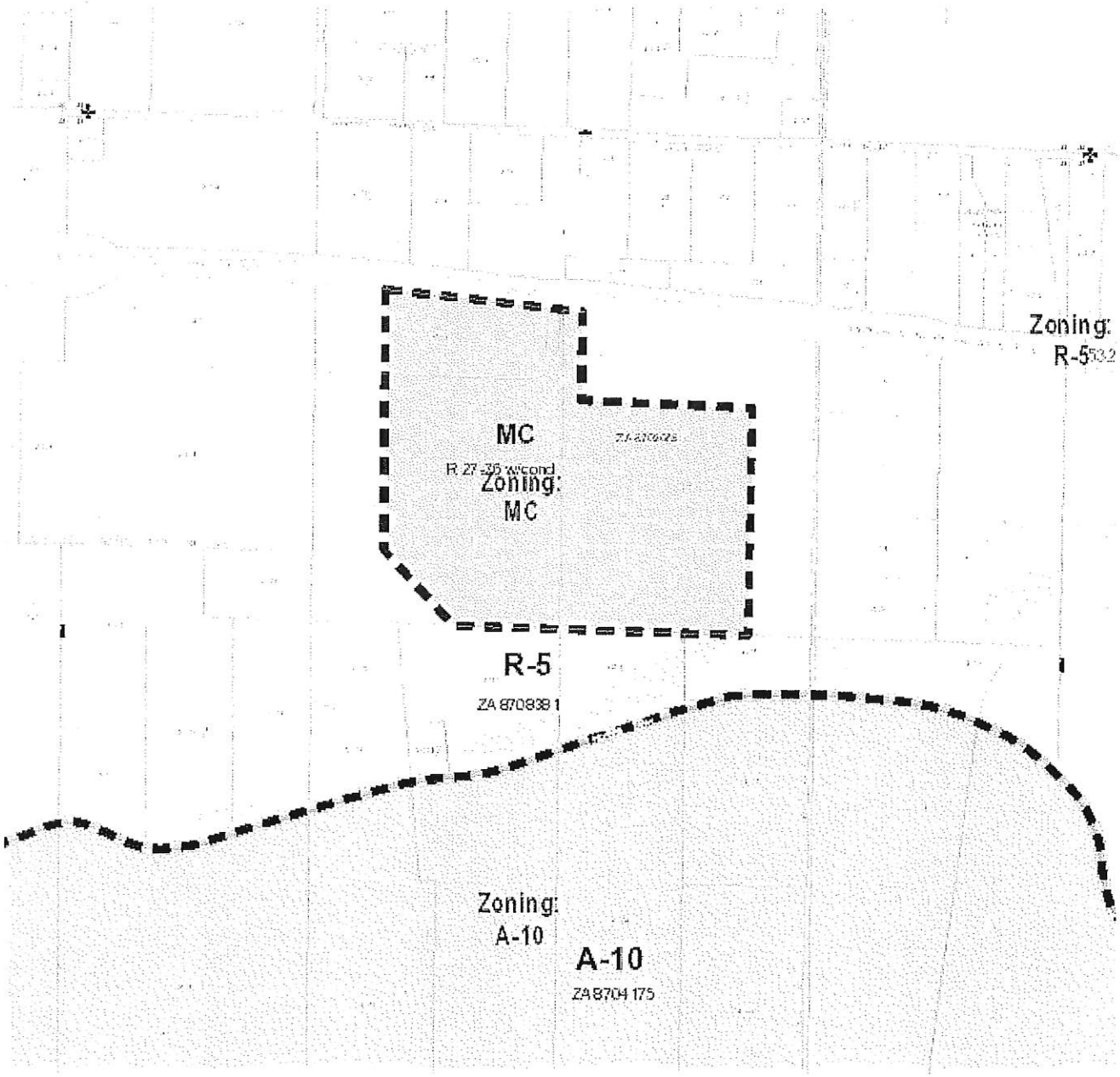
C. SIGNATURE

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: 
Name of signee: Edward Wheeler
Position and Agency/Organization: Program Director, Lenz Enterprises, Inc.
Date Submitted: May, 2017

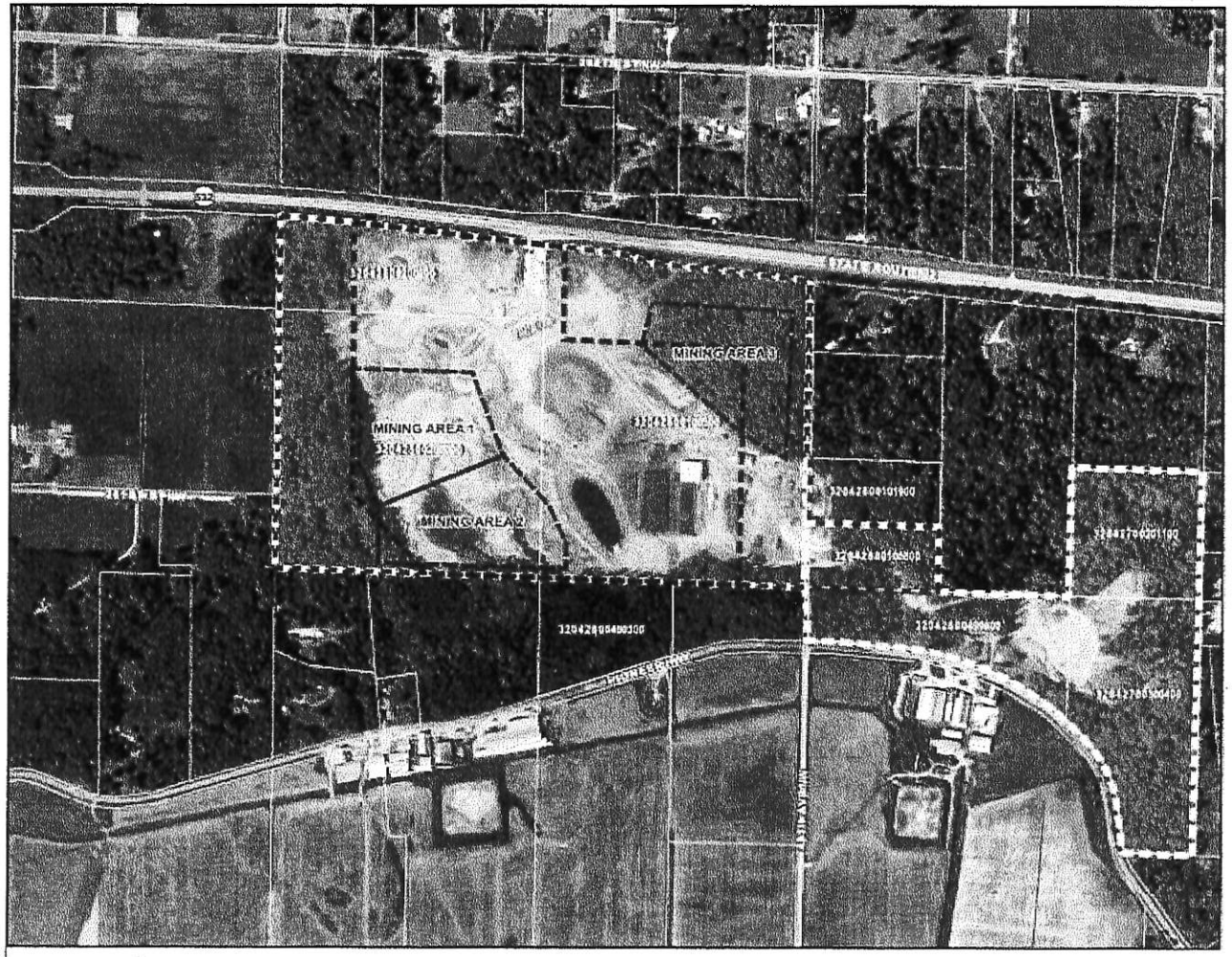


VICINITY MAP



OWNERSHIP / ZONING MAP

SITE PLAN



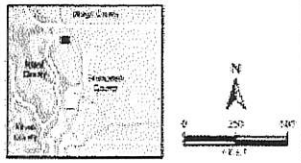
LEGEND:

- MINING AREA
- CURRENT MINERAL RESOURCE OVERLAY
- CURRENT PERMIT AREA
- PROPOSED PERMIT AREA
- PARCEL

NOTE: PARCEL NUMBERS INCLUDED FOR PARCELS OWNED BY LENZ ENTERPRISES, INC.

DRAWING(S) REFERENCE:
SNOHOMISH COUNTY PUBLIC MINERAL RESOURCE OVERLAY DIAGRAM, PARCELS, STREETS.DWG

LOCATIONS AND DISTANCES SHOWN ARE APPROXIMATE



SCALE AND UNITS REPRESENTATION OF THIS DRAWING MAY NOT BE CORRECT IF PRINTED AT DIMENSIONS DIFFERENT THAN ORIGINALLY INTENDED BY APPLICATION

associated earth sciences inc.

SITE MAP
HYDROGEOLOGIC SITE EVALUATION
LENZ ENTERPRISES
SNOHOMISH COUNTY, WASHINGTON

PROJ. NO	DATE	FIGURE
150539E604	9/17	2

NOTICE

NOTICE OF OPEN RECORD HEARING, THRESHOLD DETERMINATION, CONCURRENCY AND TRAFFIC IMPACT FEE DETERMINATIONS

File Name: Lenz Enterprises Mineral Extraction File Number: 16 112922 CUP

New conditional use permit to expand existing conditional use permit approved under PDS file ZA8702073, to align with the existing Mineral Resource Overlay designation within the county's comprehensive plan. The proposal will expand the area covered by existing conditional use permit from 54 acres to 108 acres; all of the area proposed for the expanded conditional use permit is zoned R-5.

Location: 5210 State Route 532, Stanwood

Tax Account Number: 320428-001-005-00, 320428-001-008-00, 320428-002-002-00, 320428-002-007-00

Hearing specifics: Before the Snohomish County Hearing Examiner, **June 6, 2018, 9:00 a.m.**, First Floor Hearing Room, Administration Building East, 3000 Rockefeller Ave, Everett, WA. NOTE: if a valid SEPA appeal is filed, the hearing on the appeal will be combined with the hearing on the underlying project application.

Applicant: Lenz Enterprises

Date of application/Completeness date: July 22, 2016

Approvals required: Conditional Use Permit, future land disturbing activity and all associated permits.

SEPA Decision: On **April 3, 2018**, PDS determined that this project does not have a probable, significant adverse impact on the environment and has issued a Determination of Nonsignificance (DNS). An environmental impact statement (EIS) under RCW 43.21C.03(2)(c) is not required. This decision was made after review of a completed environmental checklist and other information on file with this agency.

SEPA Comment Period: Comments must be received by **April 25, 2018**, 14 days from the date of publication of this notice in the Everett Herald.

SEPA Appeal Period: The DNS may be appealed pursuant to the requirements of Section 30.61.300 SCC and must be received no later than **April 25, 2018**.

Forest Practices: For projects requiring a Forest Practice permit from the Washington State Department of Natural Resources (DNR) and where no valid SEPA appeal is filed, the applicant may request early release of county comments to DNR. Early release of county comments may enable DNR to issue a forest practice permit for tree removal prior to the project hearing or county approvals.

Concurrency: The Department of Public Works has evaluated the traffic impacts of this development under the provisions of Chapter 30.66B SCC, and the development has been deemed concurrent. Any person aggrieved by the concurrency determination for this development may submit written documentation (refer to SCC 30.66B.180) at, or prior to, the public hearing explaining why the concurrency determination fails to satisfy the requirements of Chapter 30.66B SCC.

Traffic Mitigation: This development will be subject to payment of a Transportation Impact Fee to Snohomish County in an amount as listed in the project file. Any aggrieved person may appeal the decision applying an impact fee under Chapter 30.66B (Title 26B) SCC to the Snohomish County Hearing Examiner by submitting a written appeal to Planning and Development Services, in the manner and form prescribed by SCC 30.71.050, within 14 days of the date of this notice.

Project Manager: Tom Barnett, **425.262.2997**

Project Manager e-mail: **Tom.Barnett@co.snohomish.wa.us**

Date of Notice: April 11, 2018

HOW TO USE THIS BULLETIN

To learn more about a project:

- Call the planner assigned to the project.
- Review project file at Snohomish County Planning and Development Services (PDS) 2nd Floor Customer Service Center, Administration Building East.
- Permit Center and Record Center Hours are
  - 8:00 a.m. to 4:00 p.m. Monday, Tuesday, Wednesday and Friday
  - 10:00 a.m. to 4:00 on Thursdays
  - Please call ahead to be certain the project file is available.

To comment on a project:

- Submit written comments to PDS at the address below. All comments received prior to issuance of a department decision or recommendation will be reviewed. To ensure that comments are addressed in the decision or recommendation, they should be received by PDS before the end of the published comment period.
- Comments on a project scheduled for a hearing before the hearing examiner, may be made by submitting them to PDS prior to the open record hearing.
- PDS only publishes the decisions that are required by Snohomish County Code. Persons will receive notice of all decisions that they have submitted written comment on, regardless of whether or not they are published.
- You may become a party of record for a project by: 1. submitting original written comments to the county prior to the hearing, 2. testifying at the hearing or 3. entering your name on a sign-up register at the hearing. NOTE: only parties of record may subsequently appeal the hearing examiner's decision or provide written or oral arguments to the county council if such an appeal is filed.

To appeal a decision:

- Department decisions (including SEPA threshold determinations): submit a written appeal and the $500 filing fee to PDS prior to the close of the appeal period. Refer to SCC 30.71.050(5) for details on what must be included in a written appeal.
- A SEPA appeal also requires that an affidavit or declaration be filed with the hearing examiner within seven days of filing the appeal, pursuant to SCC 30.61.305(1).
- Hearing examiner decisions issued after a public hearing are appealable as described in the examiner's decision. Notice of those decisions is not published. You must have submitted written comments to PDS or written or oral comments at the public hearing in order to appeal a hearing examiner's decision.

HOW TO REACH US:

The Customer Service Center for the Snohomish County Planning and Development Services is located on the 2nd floor of the County Administration Building East, 3000 Rockefeller Avenue, M/S 604, Everett WA 98201 425-388-3311 TTY. PDS Web Site address listed below:

More information can be reviewed online at **snohomishcountywa.gov/PDSPostcard**

ADA NOTICE: Accommodations for persons with disabilities will be provided upon request. Please make arrangements as soon as possible but no later than 48 hours before the hearing by contacting the Hearing Examiner's office at 425-388-3538, or Department of Planning and Development Services at 425-388-7119.

AGENCY USE ONLY	NOC#:	REG#:	Date Fee Pd:	Eng. Assigned:
	11753	28983	3/6/19	

pscleanair.org
Puget Sound Clean Air Agency

Puget Sound Clean Air Agency
1904 Third Avenue, Suite 105 | Seattle, WA 98101-3317
Phone 206-343-8800 | 206-343-7522 Fax

Need assistance? Free translation services available at 206-343-8800
Español 中文 Tiếng Việt 한국어 Tagalog русский

NOTICE OF CONSTRUCTION APPLICATION FOR ORDER OF APPROVAL

The following information must be submitted as part of this application packet before an Agency engineer is assigned to review your project.

SECTION 1. FACILITY INFORMATION

Business Name: Lenz Enterprises Inc.			
Equipment Installation Address: 5210 SR 532	City: Stanwood	State: WA	Zip: 98292
Is the business registered with the Agency at this equipment installation address? ☒ Yes. Current Registration or AOP No. 10494 ☐ No, not registered ☐ Unknown			
Business Owner Name: Tom Lenz / Jason Lenz			
Business Mailing Address: PO Box 868	City: Stanwood	State: WA	Zip: 98292
Type of Business: Commercial Composting			
NAICS Code: 325314	NAICS Description: Compost Manufacturing		
Contact Name (for this application): Edward Wheeler	Phone: 360.654.6271	Email: edward@lenz-enterprises.com	
Provide a 1-2 sentence simple description of this project: This application is to modify an existing commercial composting permit to expand operations.			

SECTION 2: REQUIRED APPLICATION PACKET ATTACHMENTS

1) **$1,150 filing fee** (nonrefundable)
   - ☐ PAY BY CHECK – Attached and made payable to **Puget Sound Clean Air Agency**
   - ☒ PAY BY CREDIT – Accounting technician will contact person identified below for payment information

Contact Name:	Contact Number:
Paul Wyen	360.654.6274

2) **Detailed Project Description**
   The project description must include a detailed description of the project, a list of process and control equipment to be installed or modified, a description of how the proposed project will impact your existing operations (if applicable), and measures that will be taken to minimize air emissions.

   Detailed description of the proposed project included in packet?
   ☒ YES, attached. ☐ NO, not attached. This application is incomplete.

NOTICE OF CONSTRUCTION APPLICATION FOR ORDER OF APPROVAL

SECTION 2: REQUIRED APPLICATION PACKET ATTACHMENTS (CONT)

3) **Process flow diagram**
☒ YES, attached. ☐ NO, not attached. This application is incomplete

4) **Emission estimate**. Emission rate increases for all pollutants.
☒ YES, attached. ☐ NO, not attached. This application is incomplete.

5) **Environmental Checklist** (or a determination made by another Agency under the State Environmental Policy Act)
www.pscleanair.org/DocumentCenter/View/170
☒ YES, attached. ☐ NO, not attached. This application is incomplete..

6) Attach **equipment form**(s) applicable to your operation. Forms are available online at
www.pscleanair.org/178/Apply-for-Notice-of-Construction-Permit
☒ YES, attached. ☐ NO, not attached. This application is incomplete.

SECTION 3: PROCESS AND CONTROL EQUIPMENT (attach additional pages if necessary)

Process Equipment		Does this equipment have air pollution control equipment?	Air Pollution Control Equipment	
# of Units	Equipment Type & Design Capacity		# of Units	Equipment Type
1	Aerated Static Pile Composting, 100,000 CY/annual capacity	☒ Yes ☐ No	2	Biofiltration
		☐ Yes ☐ No		
		☐ Yes ☐ No		

SECTION 4: CERTIFICATION STATEMENT

I, the undersigned, certify that the information contained in this application and the accompanying forms, plans, specifications, and supplemental data described herein is, to the best of my knowledge, accurate and complete.

Signature

2/19/19
Date

Edward Wheeler
Printed Name

Program Director
Title

SECTION 5: APPLICATION SUBMITTAL

☒ **EMAIL application and attachments to:**
NOC@pscleanair.org

-OR-

☐ **MAIL application, payment, and attachments to:**
Puget Sound Clean Air Agency
ATTN: NOC Application Submittal
1904 3rd Ave, Suite 105 - Seattle, WA 98101

THIS SECTION FOR AGENCY USE ONLY						
Eng. Assigned (Compliance Mgr)	Eng. Rec'd (Eng)	Web description (Eng)	Completeness review (Eng)	Routed for OA Prep (Eng)	OA signed (Compliance Mgr)	OA mailed (Admin)
Date:	Date:	Date:	Date:	Date:	Date:	Date:

Lenz Enterprises, Inc. Compost Facility
Snohomish County, Washington

Solid Waste Permit Modification (SW-106)

Notice of Construction Modification (No. 10494)

ENGINEERING REPORT

February 2019

Prepared by: O2 Compost, Engineered Compost Systems, Inc, and Lenz Enterprises Inc.

312 Maple Ave, Snohomish, WA 98290

Contents

I. Executive Summary

Lenz Enterprises, Inc. (Lenz) proposes to modify and expand their current compost facility to process 150,000 tons per year of organic feedstock. The objective of this Engineering Report is to present the design basis and calculations for the engineered features of the expanded compost facility, in accordance with the Washington State Solid Waste Handling Standards for Composting Facilities [WAC 173.350-220 (4)(i)]. The goal of this Engineering Report is to obtain modified compost facility operating permits from the Snohomish Health District (SHD); and the Puget Sound Clean Air Agency (PSCAA).

This Engineering Report includes a discussion of the operating history of the Lenz Compost Facility, including the expansion of the facility infrastructure and the increase in operating capacity since 2008, when LCF first started operations. This report also discusses: 1) changes in operating strategy to increase throughput; 2) the installation of a new Aerated Static Pile System for primary composting, 3) conversion from "Mass Bed" to "Turned Windrows" for secondary composting; 4) a plan for managing odors, and 5) a plan for managing leachate.

II. Introduction

Lenz Enterprises, Inc. (Lenz) has operated a commercial compost facility since 2008. Feedstocks accepted and processed at the facility will continue to include, organic materials, meaning any solid waste that is a biological substance of plant or animal origin capable of microbial degradation.

Acceptable organic materials include but are not limited to agricultural wastes such as: herbivorous animal manure, paunch waste, shells, marijuana waste which complies with WAC 31-55-097, ASTM compostable films and containers, yard debris, food waste, food processing wastes, and wood wastes as defined by WAC 173-350-100.

The Lenz Compost Facility will expand or modify existing operational infrastructure including:

1) aerated static pile composting (ASP);
2) turned windrow composting (Stabilization); and
3) Pile composting (Curing).

The compost will then be screened and sold as a soil amendment. The Lenz Compost Facility (LCF) has and will continue to operate in compliance with all state and local regulations.

The objective of this Engineering Report is to present the design basis and calculations for the engineered features of the expanded compost facility, in accordance with the Washington State Solid Waste Handling Standards for Composting Facilities [WAC 173.350-220 (4)(i)].

The goal of this Engineering Report is to obtain modified compost facility operating permits from the Snohomish Health District (SHD); and the Puget Sound Clean Air Agency (PSCAA).

Lenz Enterprises, Inc.

Location Maps and Images

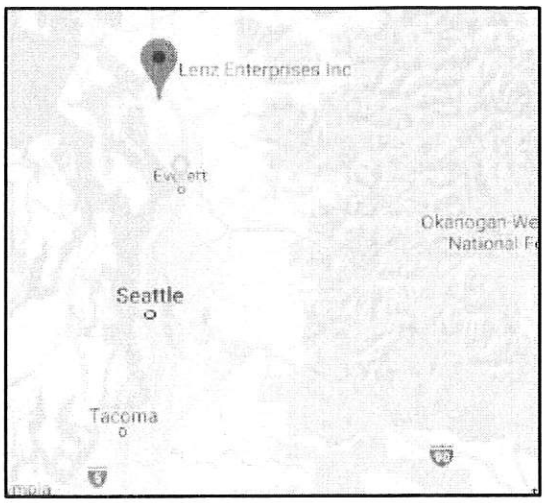


Figure 1 - Location Map

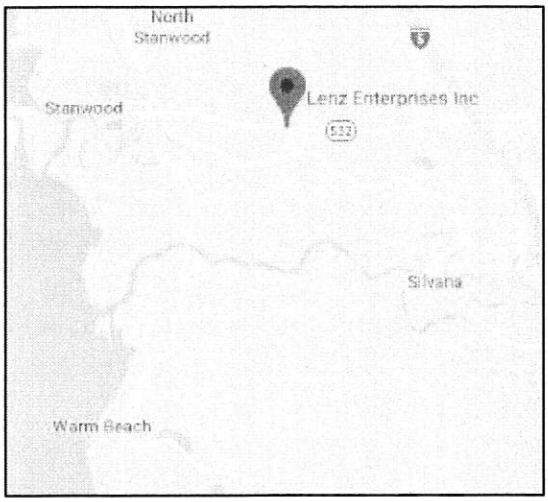


Figure 2 - Vicinity Map

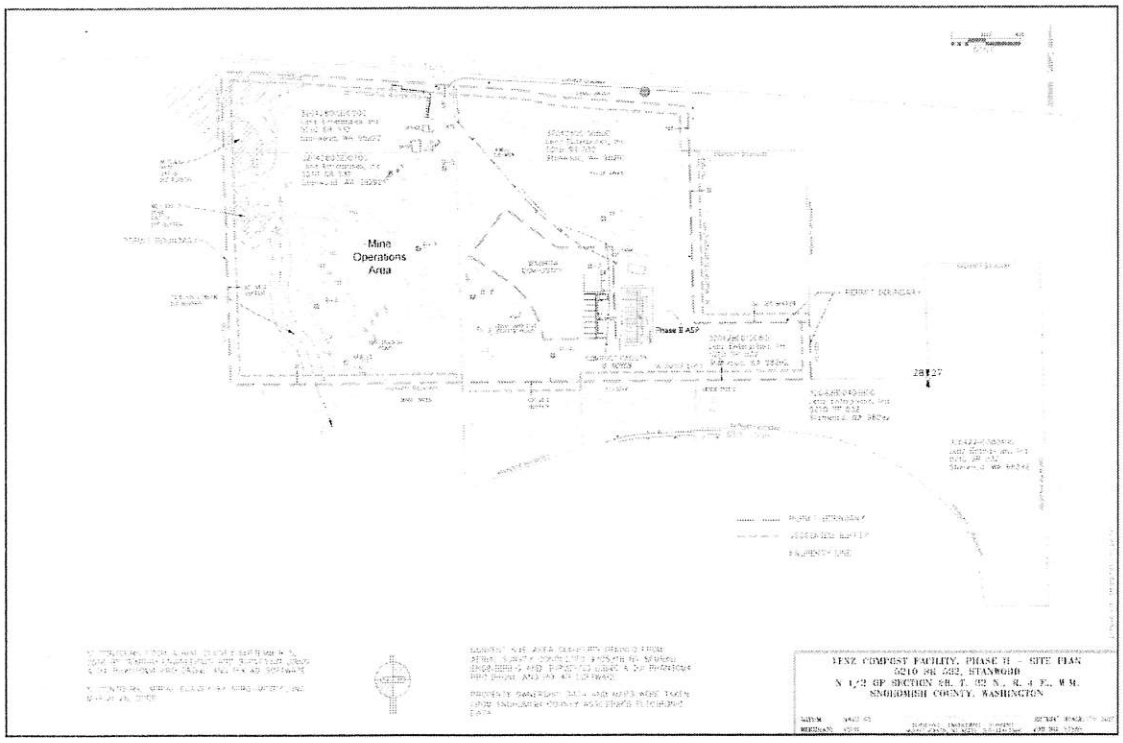


Figure 3 – Overall Site Plan

Directions to the facility and Contact

The LCF is located on the south side of Highway 532, approximately 3 miles east of Stanwood, Washington. The facility can be accessed from Interstate 5, traveling west approximately 2.5 miles from Exit 212.

Primary Contacts

Owner:	Mr. Tom Lenz, President Phone: 360.629.2933 E-mail: tom@lenz-enterprises.com
General Manager:	Mr. Jason Lenz, V.P, General Manager Phone: 360.629.2933 E-mail: jason@lenz-Enterprises.com
Program Director	Mr. Edward Wheeler Phone: 360.654-4621 E-mail: edward@lenz-Enterprises.com

Project Description and History

Operations from 2008 to 2010

The LCF was originally permitted for operation in 2008. The original solid waste permit authorized processing 30,000 tons of organics annually. This original annual permitted tonnage request was based on Lenz Enterprises' anticipation of available annual feedstock; not the treatment capacity of the system. The composting system at that time consisted of the following major components:

- Covered Receiving and Tipping Building enclosed on three sides with an air handling system that consisted of negative ventilation of the building and biofiltration of the collected off-gases.
  An Aerated Static Pile (ASP) Compost System with the ability to supply negative airflow (top down), positive airflow (bottom up), or no airflow, controlled by a computer operating system with automatic temperature set points. The ASP Compost System consists of eight concrete bunkers, each with a fully-independent air management system. Each bay has a capacity of 800 cubic yards, resulting in a total of 6,400 cubic yards with each cycle.
- Leachate collection and treatment system: consisting of a leachate collection and conveyance system; solids separation, biological treatment and storage
- Compost curing area with surface water collection and conveyance.
- Various materials handling equipment (front-end loaders, grinders, screeners, conveyors, etc.)

Typical operations during the period June 2008 to April 2010 included a 30-day active compost phase using the ASP system, followed by a 30-day curing period. Using this method of compost operations, and Solids Retention Times (SRTs), the facility capacity was 32,750 tons of organics per year.

Due to market conditions, and the fact that Lenz was new to the composting industry, actual tonnage composted was less than the permitted capacity. Experience with the system later revealed that shorter SRTs were possible which increased potential annual treatment capacity of this system.

Operational Enhancements 2010

In 2010 Lenz, working with the SHD, designed and implemented a second stage of active composting in the form of Turned Massbed composting (Massbed). Massbed composting is a continuous flow system similar to the more common Turned Windrow method of composting. The main difference between Mass Bed and Turned Windrow composting is pile geometry, with the elimination of valleys between individual windrows. This reduced the overall foot-print of the secondary composting operation and decreased leachate production.

With the implementation of Massbed composting, Lenz significantly increased treatment capacity at the site and reduced the time material spent in the ASP System to an average of 15 days. Once material reached an acceptable level of treatment in the ASP it was transferred to the Massbed where it was then composted for approximately 60 days before being transferred to the curing stage or to a final use.

While these upgrades and procedural changes provided a three-fold increase in processing capacity, LCF applied for a new permit allowance of only 45,000 tons per year.

Operational Enhancements 2013

In 2013 Lenz submitted an application to process 75,000 tons of organic feedstocks. This upgrade represented the actual capacity of the facility that had been built and tested over several years; with an adequate safety factor. This application was approved by both SHD and PSCAA and the facility has been successfully processing 75,000 tons of organic feedstocks per year since 2014.

Since the 2014 upgrade the site has been regularly inspected by SHD and PSCAA. No significant regulatory infractions have been received during that time. In addition only one odor compliant has been received since the inception of the facility in 2008. The cause for this odor issue was ambiguous but Lenz assessed operations and made minor modifications anyway to mitigate potential odors. No additional odor complaints have occurred since.

Current Compost Facility and Operation

As described previously the LCF has evolved considerably in its 10-years of operation. The following discussion provides a more detailed description of current operations, presented sequentially by operating area. These operating areas are depicted in Figure 4.

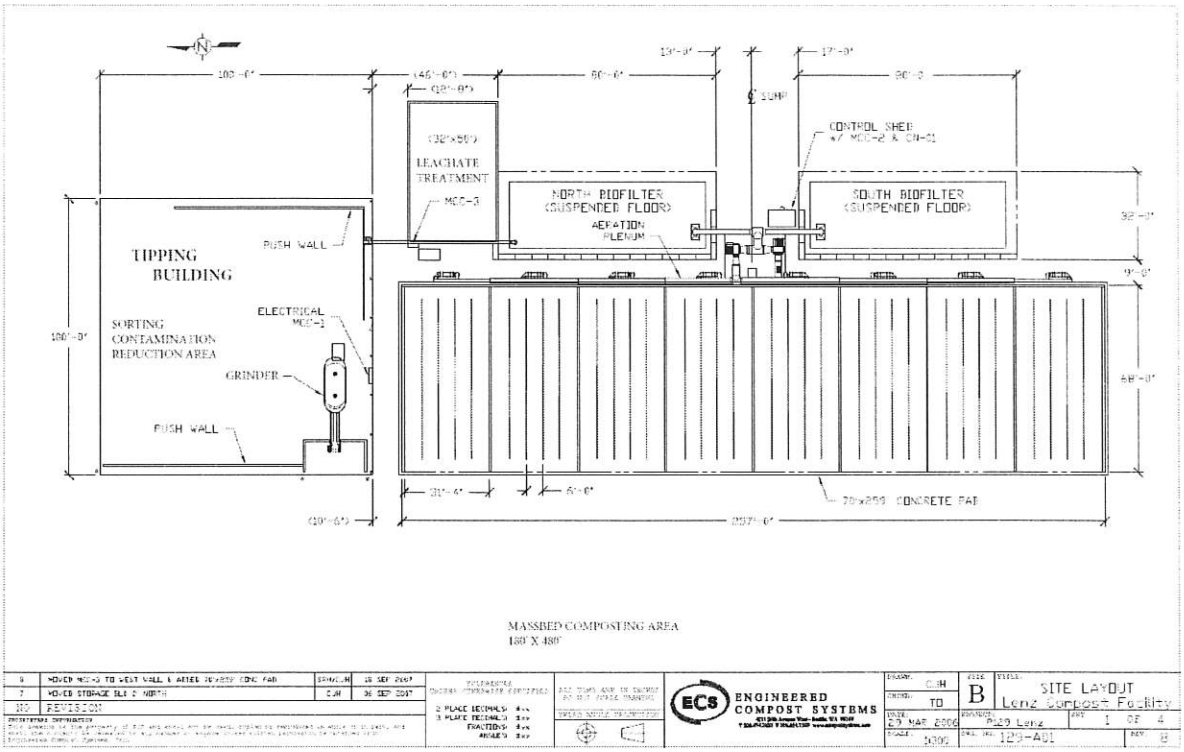


Figure 4 –Existing Composting Facility Configuration

Feedstock Receiving and Pretreatment

Organics delivered to LCF are collected in the tipping building at which point they undergo quality evaluation, initial contaminant removal, grinding, mixing and moisturizing. The prepared feedstocks are discharged by conveyor outside of the building and then transferred to one of the eight 800 cubic yard aerated compost bays for ASP Composting.

The tipping building is mechanically ventilated to minimize the discharge of potential fugitive odors. The collected gases from the building are directed to a biofilter located behind the back wall of the ASP.

Phase 1 – High Rate Composting: Aerated Static Pile

Phase 1 composting includes the initial breakdown of organics through intense management and high rates of aeration. This stage is often referred to as the "high-rate" phase of composting characterized by high oxygen uptake rates, thermophilic temperatures, and high biodegradable volatile solids (BVS) reductions.

The key objectives of this stage are to:

1. meet regulatory time and temperature requirements for pathogen reduction (55°C or higher for 72 hours);
2. reduce the BVS to a level characteristic of Phase 2 composting operations; and
3. minimize the release of volatile organic compounds (VOC's) and mitigate off-site impacts from potential odors.

Phase 1 composting is achieved using an Aerated Static Pile (ASP) process that was designed by Engineered Compost Systems (ECS) of Seattle. This process includes a computer-controlled process, negative and positive aeration, continual temperature monitoring, and individually controlled processing bays. The ASP encompasses 17,000 square feet of processing area.

Six to twelve inches of finished compost is placed over the top of the raw feedstocks in the ASP to insulate the mass and to capture and treat VOC's and odors. This cover layer is particularly important during periods when the ASP is positively aerated (i.e., air is pushed up through the pile from bottom to top) and when there is no airflow over short intervals of time. During periods when the ASP is negatively aerated (i.e., air is drawn through the pile top-down) the off-gases are similarly treated in a four to six foot biofilter located behind the back wall of the compost bays.

Phase 2 – Stabilization: Turned Mass-Bed Method of Composting

Phase 2 composting is characterized by lower temperatures, reduced oxygen uptake rates, and a greater stability of the composting organics. Once material has been treated in the Phase 2 stage for an adequate amount of time it is tested per WAC 173-350-220. When the material passes all testing requirements it is either sent to Phase 3 composting (Curing) or screened and sold.

The mass bed is turned an average 15 times over a period of 15 weeks, and with each turn the compost is advanced from the entry side of the mass bed to the exit side, at which point the compost is removed and placed in the curing area or screened.

Phase 3 – Curing: Non-Aerated Static Piles

Phase 3 curing is characterized by yet lower temperatures, reduced oxygen rates allowing for the degradation of the more refractory organics. Curing is also characterized by the establishment of lower temperature microbial populations which are beneficial in maturing the compost metabolizing phytotoxic compounds and suppressing plant diseases. The duration of Curing is dependent upon the final use of the material and the relative stability needed for that use.

Post-Processing: Screening and Temporary Storage

Following the curing phase the compost is screened in preparation for sale as a soil amendment. Two types of screens are used in the LCF operation, including:

- Komptech Multistar Screener; and
- PowerScreen Phoenix 3300 Trommel screen

The screening process includes a series of conveyors to advance the product through the network of screens and recycle the compost for re-screening when necessary. It also includes a variety of equipment specifically designed to capture and remove non-compostable contaminants (i.e., plastic, glass and metal) from the finished product such as Air-lift separators and Ballistic separation.

Leachate Treatment, Contaminant and Reuse

The primary purpose of the Lenz Leachate Collection and Treatment System (LCTS) is to treat and store leachate collected at the LCF for use in the composting process. The Lenz LCTS is a closed-loop system and all water collected and treated is used in the composting process. The treatment system is designed to reduce the Biological Oxygen Demand (BOD) and Total Solids (TS) content of leachate produced and collected at the LCF.

Leachate is collected at a series of storm drains installed throughout the LCF (Figure 5). The storm drains drain to the LCTS lift station. The LCTS lift station includes a grinder pump, coarse bubble aeration and level controls. Leachate is pumped from the lift station to primary solids separation.

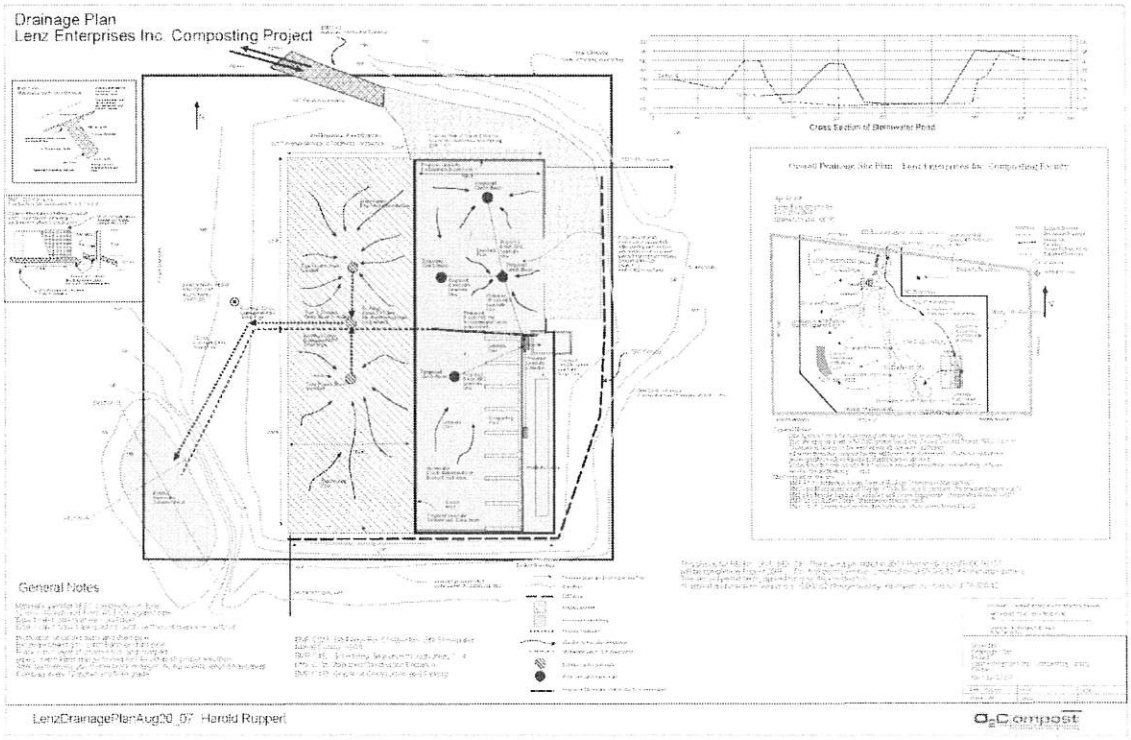


Figure 5 – Compost Facility Drainage Plan

Primary Solids Separation

A Rotary Drum Screen (RDS) is used to separate solids from the waste stream. The RDS consists of an internally fed uniframe rotary screen constructed of 304 stainless steel construction. Solids separated in the RDS are reused in the composting process while the separated liquid portion is delivered to the Modified Sequencing Batch Reactor (MSBR).

Biological Treatment

The MSBR is used to reduce the Biological Oxygen Demand (BOD) and Total Suspended Solids (TSS) of the leachate. The MSBR can be operated in numerous treatment scenarios and is automatically controlled by a Programmable Logic Controller (PLC) that regulates aeration, mixing, level, settling and decant. Once leachate has reached the desired level of treatment it is pumped to the Leachate Lagoon or used directly in the composting process.

Leachate Lagoon

The Leachate Lagoon consists of a lined lagoon (60-Mil Geo-synthetic Liner) with an approximate capacity of 2.5 x 106 gallons. The lagoon is used for storage of treated leachate during the wet season. Leachate in the lagoon may be recirculated to the MSBR during the treatment cycle as necessary to achieve treatment goals.

III. Proposed Compost Facility Upgrades

The following discussion provides a detailed description of the proposed expansion of the LCF as well as the changes to operation and management that will maximize process flow efficiency to allow for the processing of 150,000 tons annually. This discussion is presented sequentially by operating area, each depicted in the Proposed Compost Facility Configuration, Figure 6. Infrastructure upgrades include additional ASP air floor, additional Windrow composting and modified Curing area.

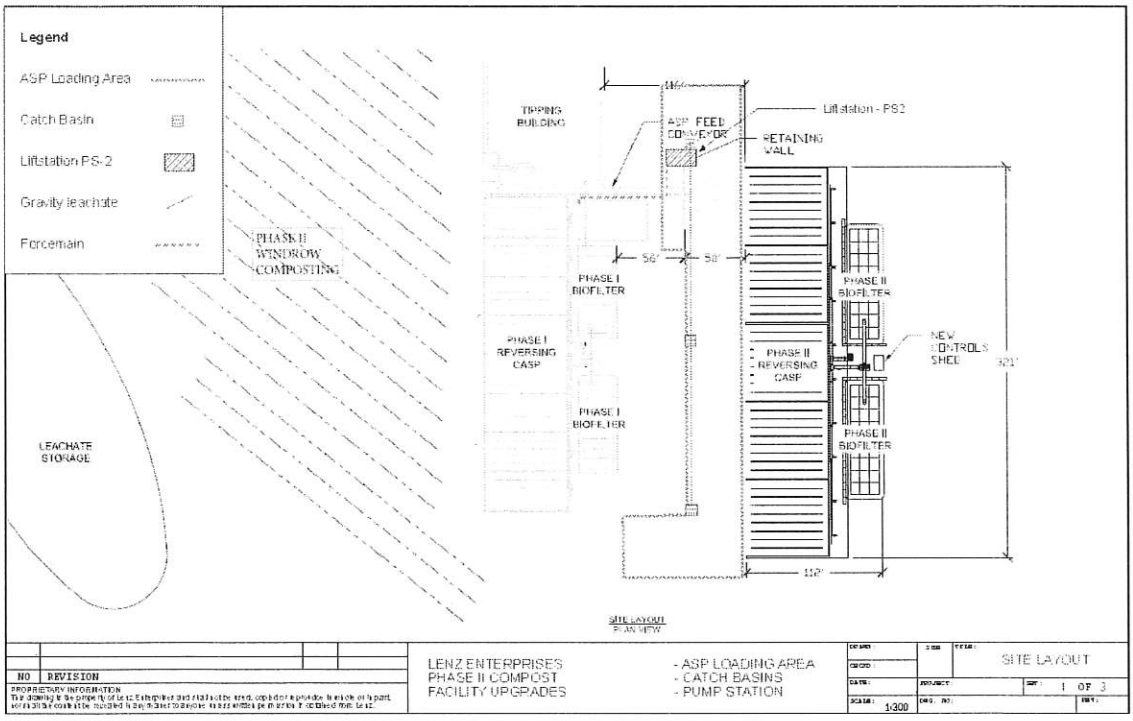


Figure 6 – Proposed Compost Facility Configuration

Receiving and Pretreatment

The current system for feedstock receiving and pretreatment takes place six hours per day by one shift of operators, five days per week. The first proposed change to feedstock receiving and pretreatment will be to establish two, overlapping shifts, of trained compost personnel to facilitate a longer processing period from 7:00am to 5:30pm Monday through Saturday. This will increase the processing potential per day and add one day of processing per week, resulting in an annual throughput capability of 157,500 tons through the tipping building.

The second proposed change is to the feedstock receiving evaluation process to allow for more accurate separation of brush and stumps and other non-contaminated materials. These materials do not need to be treated through the initial screening process, nor do they need to be hand-picked for contaminates on the picking station. Diverting these materials directly to grinding (bypassing initial screening and hand-picking) results in a higher throughput of organics which in turn reduces residence time and odor potential. This technique has already been extensively tested on site and results in an overall production increase of up to 35%. The resultant processing capacity in the receiving stage using this technique and the increased hours results in a processing capability of 183,750 tons annually through the tipping building.

Another proposed change affecting this stage of processing will be a dedicated maintenance staff that will maintain and repair equipment during operational downtime. This will result in less downtime of equipment and operations and higher efficiency.

ASP Composting

The proposed new ASP System will use the same processing technology as the existing system and the same environmental controls (dedicated biofilters for negative air processing and biofilter caps for positive air processing). An additional 22,000 square feet of processing area is proposed for this upgrade. This is equivalent to a 130% increase in floor space which in turn increases the functional processing capacity on the air floor to 172,000 tons annually. Because this is more processing capacity than required for the proposed upgrade to 150,000 tons annually, there is a built-in factor of safety. As a result, average retention times in the ASP can be longer resulting in more controlled composting for a longer period resulting in lower odor and VOC emission potential.

Lenz has found, through actual operations, that the particle size of initial feedstock preparation can be reduced if ambient air flow to the ASP is increased. This reduction in particle size increases the functional capacity of the ASP by approximately 20 percent by reducing interstitial space in the feedstock mix. The additional capacity can be used, when necessary, to increase residence time in the ASP which in turn increases the stability of the compost prior to the shift to Windrow composting. A higher Cubic Feet per Minute (CFM) of air to the ASP's is proposed in this design.

Turned Windrow

Phase 2 composting is currently achieved on site using Massbed composting. This system is identical to windrow composting only the windrows are pushed together to eliminate valleys between the rows. The current process includes approximately 72,000 square feet of area that can process a static compost pile of 21,333 cubic yards.

Proposed upgrades to this process include using an additional paved area of 177,000 square feet for processing. Additionally, this process would change from the Massbed system of composting to

windrow composting. Windrow composting will facilitate fasters bed turns and more exposure of the pile to natural (non-mechanical) aeration in-between turnings. These two factors will speed the composting process and provide shorter residence times to achieve final compost stability.

Curing

Enhancements to Phase 1 and 2 composting will reduce the amount of time required for Curing resulting in decreased pile residence times and a decrease in the potential for odor impacts and VOC emissions from this phase of the process.

Stormwater Control, Treatment and Reuse

An additional 177,000 square feet of Phase 2 processing area will result in additional stormwater capture. However, because of the evaporative energy of the composting process, an excess of evaporative capacity will still exist on site and therefore no additional winter leachate capacity will be required.

The 24-hour, 25 year storm event will increase from a gross potential of 268,000 gallon to a gross potential of 543,000 gallons. Assuming an average absorptive and interstitial capacity of five percent of the 67,000 cubic yards of compost in the secondary process (the location of the potential stormwater increase) the capacity for holding this additional water is 673,000 gallons. This change will result in no net gain to storm event runoff from the additional impervious surface. A detailed calculation of the site water balance is included in Appendix B.

Management and Control Improvements

A split-shift will be added to the composting process to fully utilize the operational day of 10.5 hours. This will also allow time every day where extra personnel are available to conduct some of the more labor-intensive duties and routine maintenance to mitigate downtime. In addition to the split-shift operations crew, a dedicated maintenance crew will be established to ensure that all equipment is properly maintained and ready for use as soon as operations personnel arrive at work each day. Incoming loads of organics will be managed to eliminate smaller "packer-trucks" delivering only a few tons of material and replace them with larger heavy-duty trucks capable of delivering up to 30 tons per load. This will reduce truck traffic to the site and create a more homogenous, manageable, and predictable delivery schedule that will further streamline operations.

Existing Facility / Expanded Facility - Summarized

The following two tables summarize the increase in annual processing capacity for ASP and Windrow composting:

Table 1 – Increase in Phase 1 Processing Capacity		
Current Annual Capacity	75,000	tons/yr.
Current ASP Floor	17,000	ft2
Additional (New) ASP Floor	22,000	ft2
Increase in Floor Area	130	%
Processing Capacity of New ASP	97,000	tons/yr.
Total Expanded Processing Capacity	172,000	tons/yr.

Table 2 – Increase in Phase 2 Processing Capacity		
Massbed Volume (Current)	21,000	cy
Massbed Area (Current)	72,000	ft2
Turned Windrow Pad (Expanded)	177,000	ft2
Volume per Windrow (Expanded	7,850	cy per acre
Combined Area for Secondary Composting	6	Acres
Total Windrow Capacity	45,000	cy
Increase in Volume Capacity	2	times

IV. Design Basis

Feedstocks: Source & Description

Feedstocks accepted at Lenz include curb-side yard and food residuals, land clearing debris, pre- and post-consumer food residuals, animal manure and other miscellaneous organic residuals approved for acceptance by site permits. These feedstocks originate primarily in Snohomish, King, Island, and Skagit Counties.

Mass Balance Analysis

The mass balance for the system will vary from year-to-year based on contracts for feedstocks, and seasonally based on the type of organic residuals available. A generalized mass balance flow is illustrated in Figure 7.

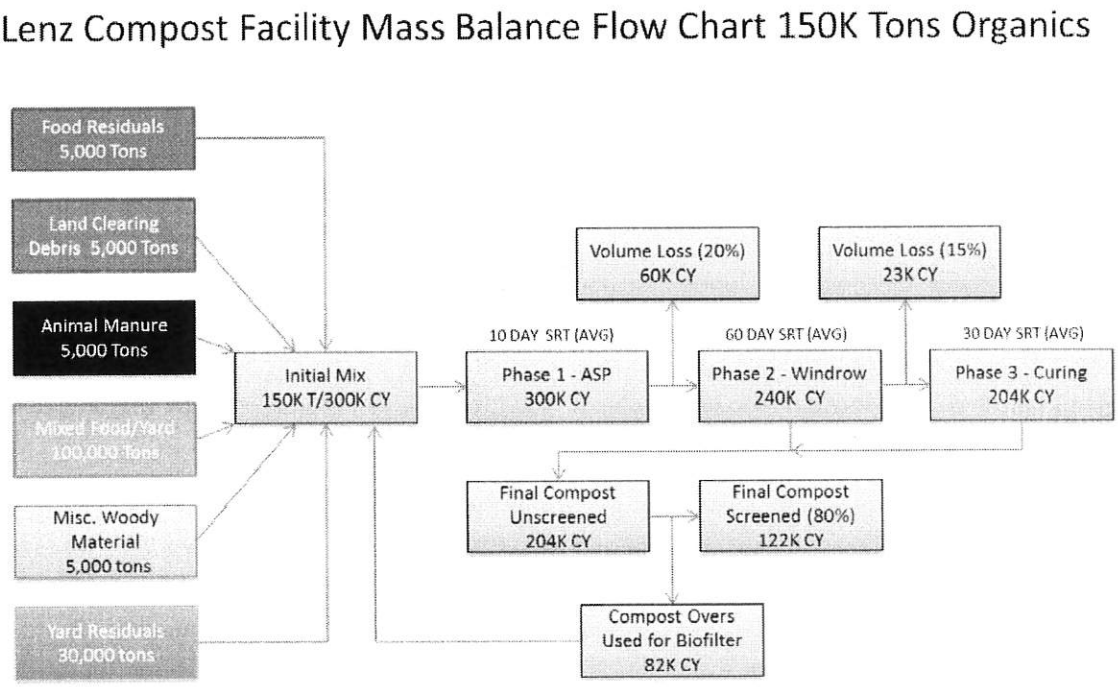


Figure 7 – Mass Balance Flow

Grading and Drainage

All active composting and processing areas will be sloped from the outer edges to the leachate drains. Leachate conveyance piping is sized at 12-inch to accommodate normal and storm flows and to facilitate regular cleanouts. Active compost pad perimeters include berms on the exterior edges to mitigate cross-contamination of leachate and stormwater.

Compost Pads

All actively composting material on site will be placed on a pad that is curbed and graded to prevent ponding, control run-off and convey stormwater leachate to conveyance, storage and treatment systems. All stormwater that lands or comes in contact with actively composting materials or the compost pad will be managed as leachate in accordance with WAC 173-350-220 (4)(f).

Pads will be constructed of concrete and non- porous asphalt, include three to four inch perimeter berms to facilitate separation of on-pad leachate from off pad stormwater and be constructed with a slope of at least one percent towards conveyance collection basins to avoid ponding.

Pads will provide sufficient structure to prevent contamination of soil and groundwater underlying and adjacent to the pad due to the perimeter berms, pad thickness and non-porous nature of the material facilitated by the mix of the material as it is applied. Asphalt will be laid in a single four-inch layer to ensure low pad permeability.

The pad underlying the new ASP zones and immediately adjacent to these areas (Figure 6) will be constructed of poured concrete and be designed as described in the structural engineering report prepared by Kingworks Consulting Engineers of Bellingham Washington (Appendix D). This pad was designed based on knowledge of the underlying stratigraphy, use of the pad and type of equipment to be operated on the pad.

- Underlying stratigraphy: The area underlying the new ASP zones and the expansion of the secondary composting area is characterized as a thick layer (25-65 feet) of glacial till overlaid with approximately four feet of compacted structural fill. The structural fill consists primarily of four-inch minus crushed rock mixed with silty-sand with lesser amounts of crushed concrete. A geotechnical evaluation of the module of subgrade reaction for the area has resulted in a k-value of approximately 125 pci.
- The concrete portion of the pad was designed to accommodate heavy use of a wheeled excavator, specifically a 980M or a 982M (or equivalent) with an operating weight of 66,337 pounds. The M series axles are designed to oscillate to +/- 13 degrees helping to ensure all four pneumatic wheels stay on the ground providing stability and traction and avoiding un-even loading on any wheel. Typical tread width in a loaded scenario is 10 feet 9 inches using a Michelin 29.5R25 XLDD1 L4 tire or equivalent (includes width over tire bulge and tire growth).

With an assumed axle distribution of 60/40 (according to manufacturer's specifications) an assumed 25 PSI will occur assuming equal loading side to side.

Table 3. Caterpillar 982M with 29.5R25 XLdd1 L4 Tires	
982M Fully loaded	66,337 pounds
Weigh per heavy axle (assuming 60/40)	39,802 pounds
Tire surface area (fully loaded)	810 square inches
Axle tire surface area (both tires)	1,620 square inches
Pressure exerted on surface	25 pounds per square inch (psi)

Structural calculations for the concrete pad are provided in the structural calculations and specifications (Appendix D).

- The asphalt portion of the pad was designed to accommodate use of the above-mentioned loader, as well as regular use of a Komptech Topturn X67 compost windrow turner (or equivalent). The X67 has a gross vehicle weight of approximately 47,000 pounds and a track ground pressure of 15.2 lbf/in^2.
- The underlying stratigraphy with a four-inch asphalt covering is more than adequate to support this vehicle and its operations. Lenz has operated a higher ground pressure unit on the same substructure for over 10 years with little degradation of the pad. Asphalt will be non-porous to eliminate any potential contaminant flow to subsoils and be laid in a single four-inch layer.
- Subsoils are composed of thick layers of glacial till. Glacial till is commonly referred to as the hard pan due to its very dense properties. Glacial till on site was deposited during an earlier glacial period, approximately 25,000 years ago. Permeability of this layer is extremely low, on the order of 1 $X10^{-8}$ cm/sec. The high density of this material is a result of over consolidation caused by the weight of the glaciers and overlying soils on this deposit. Till in this area is at a depth of approximately 10 feet below grade to a depth of up to 60 feet (i.e., up to 60 feet thick).

Water Balance Analysis

The site water balance was prepared to evaluate leachate conveyance, treatment and storage needs for both annual and storm flows at the site.

The objective is to demonstrate:

- Sufficient leachate design capacity for a 24-hour 25-year storm event.
- Evaporation potential to manage all collected rainwater that is considered leachate.

Total surface area to receive and collect precipitation includes 223,000 ft^2 of impermeable surface plus 54,000 ft^2 of pond surface. The majority of the surface will have composting or curing material located on it. This summary will not consider absorption directly into the material on the surface for estimating capacity for a storm event. Absorption will occur which will slow and buffer any flow to the leachate treatment system and pond. This absorption will assist in heat management and bring water into contact with available heat which supports water evaporation.

A 24-hour 25-year rainfall event may deposit up to 2.5-inches of water which equates to 543,000 gallons. The leachate pond has the capacity to store 2.5 million gallons which provides adequate storage for this volume.

The average precipitation for the month of November (typically the highest precipitation) is 8.15-inches of water totaling 1,407,000 gallons. The leachate pond has the capacity for 2.5 million gallons and is relatively empty at this time of year. The existing leachate retention pond is sufficiently sized to provide storage for high rainfall events and for average rainfall during the winter months.

Regarding management of collected water, the proposed production capacity for the expanded LCF is 150,000 tons per year of feedstock. Precipitation on 277,000 ft^2 of surface area will fall on pond surface, minimal bare concrete and asphalt, and piles of composting material.

Much of the precipitation will fall directly on piles of composting material. Water will be evaporated due to the heat generated by biological activity and breakdown of carbohydrates at different rates throughout the year.

A thermal evaporative capacity analysis was conducted to calculate and confirm sufficient energy is available to evaporate perception even in the winter months (Appendix B). Estimates indicate there is excessive energy capacity available to evaporate expected annual precipitation.

These calculations are based on equations and information provided in "The Handbook of Compost Engineering" written by Roger T. Haug (1993).

Annual Evaporation Capacity Factors

- Annual totals are used in this estimate
- 150,000 tons or composting material per year
- 50% water in the raw feedstocks
- 40% water in product
- Heating of solids
- Heating of air
- 35 inches of rain per year
- As a safety factor we assume only 65% of the generated heat evaporates water

- Available energy can evaporate 9.9 x 10^6 gallons of water annually
- Potential captured precipitation totals are 6 x 10^6 over a typical year
- Calculations result in a water deficient annually

The existing leachate lagoon is capable storing storm flows with a large safety factor. The composting mass will not only absorb and adsorb much of the precipitation; the considerable interstitial space of the composting mass will provide a buffer (temporary storage area) to mitigate storm surges which might otherwise overwhelm conveyance systems.

Impoundments (WAC 173-350-220(4)(i))

The Lenz Compost Facility has an existing lined impoundment that is used to store leachate during the winter season. This impoundment is designed for a maximum water level of 17.5 feet with a minimum free board of 18 inches above the design operating capacity. The capacity at maximum water level is 338,000 cubic feet, or approximately 2.53 million gallons. The impoundment is lined with a 60 millimeter HDPE liner and inspected every five years per Washington State regulations.

The existing impoundment was constructed larger than required for current operations and is sufficient to accommodate storage for the proposed increased feedstock. The existing impoundment meets all Washington State design requirements and will continue to be operated to meet all operating requirements of the rule. Site water balance calculations are included in Appendix B.

The 60-mil lined impoundment is tested every five years per state requirements. In 2009, Northwest Linings performed a non-destructive test to evaluate liner performance. All locations tested, including all seams, passed the pressure loss test. On September 18, 2015, Leak Location Services performed another leak survey on the pond. No leaks were found during the survey which included survey lines spaced at 2.5 feet. As a quality assurance check, a simulated leak was constructed and location scans were made to determine the minimum distance that the simulated leak could be reliably detected. The simulated leak was detected from approximately three feet.

Stormwater Management

The Lenz Compost Facility is located within a 108 acre sand and gravel mine. Stormwater outside of the compost facility are regulated by the Washington State Sand and Gravel General Permit. All stormwater in the mine area (outside of the compost facility) is collected and infiltrated onsite in accordance with the General Sand and Gravel permit and site conditions.

Stormwater separation from leachate on the LCF pad is attained using perimeter berms on the active composting pad. Stormwater outside of this pad will drain to the mine stormwater system or infiltrate permeable site soils. Stormwater collection, conveyance, treatment and infiltration of stormwater in the sand and gravel mine is outside of the purview of this document.

Annual Leachate Management

The Lenz Compost Facility has been designed to capture all stormwater that lands on active composting areas (the pad, ASP, etc.) and completely reuse this water in the composting process. All stormwater that lands on the active composting area is considered "leachate". WAC 173-350-100 defines "Leachate" as water or other liquid within a solid waste handling unit that has been in contact with solid waste or has been contaminated due to contact with landfill gas. All leachate is reused at the Lenz Compost Facility in the current composting process.

Active composting pads include perimeter berms to capture leachate. Berms and pad slopes will direct leachate to the conveyance system. Leachate will be conveyed to catch basins, intermediary pump stations, and then finally to the primary pump station at the south-east corner of the tipping building. At the primary pump station leachate is pumped, via a chopper pump, to the leachate treatment system.

The leachate treatment system includes a rotary drum screen to separate solids from the waste stream. Solids removed during this screening process are returned to the composting process in the tipping building. After screening, leachate is delivered to the modified sequential batch reactor (MSBR) where biological and solids reduction occurs. The MSBR occurs in a 144,000 gallon treatment tank. The MSBR includes three stages of treatment:

- Stage 1 - Aeration. During the aeration stage the treatment tank is mixed and aerated using a blower and fine bubble diffusion system.
- Stage 2 - Settle. During the settle stage the tank contents are quiescent. This allows for the biologically active solids to settle to the bottom of the tank.
- Stage 3 - Decant. During the decant stage treated and clarified leachate is pumped from the top of the tank and either used immediately in the compost process or delivered to the storage lagoon for use at a later time.

No modifications to the MSBR are planned for the proposed upgrade as the system was oversized during initial construction and is adequate to treat the additional flow.

Once the leachate has been treated it may be diverted in one of two directions depending upon the season and the needs of the composting process. Typically during months of low precipitation (May through October) treated leachate is directed back to the composting process to moisturize initial feedstocks and the ASP process both of which are moisture intensive. During months of greater precipitation (November through April) treated leachate is directed to the leachate impoundment, after treatment, for storage until the following spring when it will be used in the composting process. Target moisture levels for feedstocks are 50-60 percent but can vary depending upon the characteristics of the feedstock.

Composting is a moisture-intense operation due to high (thermophilic) temperatures attained during the process. WAC 173-350-220 requires that compost reach temperatures of 55 degrees Celsius for at least 72 hours to kill pathogens. In reality, a well-maintained compost facility, such as the LCF, will realize these temperatures, or greater, for weeks or months depending upon the types of feedstocks and how they are processed.

Applied calculations result in excess water evaporation potential at the site. This potential results in a theoretical moisture imbalance due to the high energy of the composting process. Calculations are shown in Appendix B. In practice a composting system's water balance is largely dictated by site management. To accommodate this annual moisture shortage composting moisture levels are reduced during certain times to minimum levels to conserve this resource.

Storm Leachate Management

WAC 173-350-220(4)(e)(ii) requires that stormwater and leachate collection and conveyance structures be designed based on the volume of water resulting from a twenty-five-year storm event.

The current LCF expansion plan includes the installation of one additional lift-station at the north end of the new ASP Compost Bays. This new lift-station (PS-2) will have a force-main pumping system to the main lift-station currently located at the southeast corner of the tipping building (next to the treatment system). Lift station pumping will include sufficient capacity for storm flows with backup pumps available for 100-percent redundancy in case of equipment failure. Lift stations and associated pumping systems will be purchased pre-designed by the manufacturer to meet instantaneous and long-term flow patterns.

Leachate Pump Station (PS-2)

Introduction

The Phase II ASP will require a new pump station to convey collected leachate to the leachate treatment system (MSBR). The new pump station (PS-2) will be located at the low point of the service area in the northwest corner of the new ASP. Leachate collected from the new ASP area will gravity flow to the pump station. Leachate collected in the pump station will be aerated while residing in the pump station and then pumped via a force-mail to the MSBR. PS-2 will be located underground in a pre-engineered concrete and will include the following equipment:

- (2) submersible pumps, with 1hp 230/460V motor, and moisture and over-temperature relay switches (or equivalent)
- VFD starters/controllers
- SCL20DH-1.5-115 FPZ Regenerative Blower 1.5HP / 115/230 (located above-ground in an equipment building)

- (4) EDI MaxAir™ SS Closed Bottom Coarse Bubble Diffusers (24"L, 3/4"NPT) for aeration
- Flowline EcoPod EL-24-00 level indicator/pump switch (or equivalent)
- PLC control system

Hydraulic Analysis

PS-2 will receive leachate collected from the Phase II ASP zones, ASP ventilation system, bio-filtration system, and load out area in front of the Phase II ASP. This includes the following surface areas:

- Phase II ASP area (Figure 6) will include five zones each 63' wide and 68' long (4,284 ft^2). Because this area is covered with up to 10' of composting biomass and temperatures exceed 55 degrees Celsius this area is a leachate sink evaporating significant volumes of moisture.
- Phase II biofilters: 5,488 ft^2 of covered biofilter area. Because this area is covered with a 4-6 foot woody biofilter and operates at high temperature, this area also evaporates moisture.
- The Phase II ASP ventilation system moves air to and from the ASP zones and the supply and exhaust fans; as well as air to the biofilter system. The static level of leachate in this system does not very significantly.
- The area in the load out area in front of the Phase II ASP will include a surface that is 50' wide and 350' long (17,500 ft^2); there will be a side walk area between ASP and biofilters (1,356 ft^2); and asphalted travel and turn around areas (20,106 ft^2). These areas will be the primary source of leachate delivered to the PS-2.

Stormflow management for the load out area of Phase II ASP is based on the 24-hour, 25-year storm event. The active storm collection area is 28,856 ft^2, and the volume of potential precipitation is 44,967 gallons based on 2.5 inch rain event.

The wetwell of PS-2 is designed to provide acceptable pump intake conditions, adequate volume to prevent excessive pump cycling, and sufficient depth for pump control, while minimizing solids deposition. A duplex pumping system with Variable Frequency Drive (VFD) speed pumps help to mitigate excessive pump cycling. The minimum volume between pump on and off levels was calculated using the following general formula:

$V = tQ/4$, where

V = minimum volume (gallons)

t = minimum time between pump starts

Q = pump capacity (gallons/minute)

Given a wetwell volume of approximately 5,000 gallons, and minimal pump cycling conditions, this equation results in V= 187.5. The wetwell is designed with two transfer pumps each capable of pumping

150 GPM with a total sustained maximum flow of 300 GPM. This duplex system is more than adequate to transfer expected storm flows.

Primary considerations for the forcemain conveyance of leachate from PS-2 to the MSBR are peak and average flows from the Phase II ASP load out area. The 24-hour, 25-year storm event for the area results in 44,967 gallons based on 2.5 inch rain event which can be extrapolated to surge events of up to 50 GPM. Calculations indicate that a 4-inch inside diameter pipe is adequate for this flow. To accommodate expected flow and unexpected conditions (cleanout flows, pump failure, intense storm events) simultaneously, a minimum 4-inch conveyance piping is proposed.

Odor Mitigation

Because leachate has an odor potential when stored, two design conditions have been incorporated into PS-2. The first is an oversized pumping system to transfer water to the MSBR leachate treatment system on demand. This will reduce extended storage in the wetwell. The second is the design and use of a pneumatic mixing system for PS-2. PS-1, which was designed and has been operating for several years transferring leachate from Phase I composting, incorporates an identical system. This includes a set of coarse bubble diffusers which act to reduce odor potential. Mixing requirements are based on maximum water levels, type of diffuser, which dictates air pressure at the point of discharge, and aerator configuration. With an estimated 84 square foot tank floor area, a minimum of four coarse bubble diffusers will be required.

Specifications for proposed PS-2 equipment and design calculations are provided in Appendix B.

ASP Composting - Aeration

Introduction

Engineered Compost Systems (ECS) of Seattle Washington designed the aerated static pile system (ASP) for both the existing LCF and the planned Phase II expansion.

ECS aerated compost process systems are designed to provide the thermal, chemical and biological conditions that enable compost operators to comply with Best Management Practices (BMPs). Peer-reviewed science and field measurements have demonstrated how this approach to process control efficiently reduces odor and VOC emission potential and enhances the stabilization rate of organic matter (the goal of composting). The ECS ASP system design facilitates good operations by providing operators with clear real-time information, operational flexibility, and straightforward maintenance procedures.

There are three primary objectives of compost system design that are addressed in this section. The first is the proposed ASP and how the system's features will enable operators to achieve process control objectives. The second is key aspects of the Operation and Maintenance (O&M) manual which need to

be followed to consistently achieve results year to year. The third is an overview of regular Best Management Practices (BMPs) that operators are encouraged to follow.

Aeration Supply Rate and BMP Process Control

The ability of an aeration system to provide adequate oxygen and temperature control early in the process is one the keys to BMP compliant conditions. The amount of bio-oxidative heat generated can vary from one batch to the next, and within a single batch from one day to the next. To manage this variable metabolic activity, the aeration rate must be dynamically controlled using temperature feedback and have a wide range of air delivery rates.

The key metrics for an aeration system are thus the single batch (single zone) peak aeration rate (the ability to limit temperature rise during spikes in heat generation), and the system-wide average aeration rate (the ability to limit temperature rise during average heat generation). These aeration rates should be matched to energy generation capability of feedstocks.

Fortunately the Lenz facility has years of operational data which provides insight into the characteristics of their specific feedstocks. Also, since the proposed design is a multi-zone ASP with a centralized aeration system, peak aeration will never be required by all batches simultaneously. This allows the aeration system to be more efficiently design to reduce energy consumption.

ECS has developed a detailed thermodynamic model of the composting process that calculates the spatial and time varying effect of heat generation and heat transfer on the pile temperatures. This model considers aeration design parameters (air flow rates and direction), system control settings, and pile depths. To calculate the heat generation this model uses published research to characterize the effects of time and temperature on the bio- oxidation rates.

The rate of composting and heat generation was adapted from Marugg, et al 1993. The model composting rate is proportional to the current mass of "compostable solids." Compostable solids are the fraction of total solids that can be metabolized under normal composting conditions. This is different from the volatile solids fraction, which can be oxidized by either biological or thermal means.

$$\frac{dm_{cs}}{dt} = -k_t m_{cs}$$

$$m_{cs} = current\ mass\ of\ compostable\ solids$$

$$k_t = composting\ rate\ (temperature\ dependent)$$

The composting rate, k_t, depends heavily on the temperature of the material. It also depends on the types of feedstocks used as well as other physical factors such as moisture content and pH. The ECS model accounts for variations in temperature and moisture content. The relationships between

temperature and moisture content and the composting rate are shown below. The model used includes the following assumptions:

- Inlet Air Temperature: 20 deg C
- Inlet Air Relative Humidity: 40%
- Initial Material Temperature: 20 deg C
- Initial Material Moisture Content: 60%
- Initial Compostable Solids: 50% of total solids
- Initial Density: 925 lbs. per cubic yard
- Pile Height: 8 feet
- Rate of Composting: 10% of remaining compostable solids per day at 60C
- Oxygen Consumption: 1.6 kg O2 per kg oxidized solids

ECS uses this model to characterize expected pile temperatures, which is overlaid with the expected inter-pore oxygen levels, which together indicates the water film layer oxygen saturation levels per Henry's Law (discussed below). Figure 8 illustrates the output of the ECS thermodynamic composting model that uses selected peak and average aeration rates, in a reversing aeration system, to model the temperatures read on dual sensor 60" temperature probe (which will be used in the Lenz Phase II CASP system).

The model calculates oxygen consumed and remaining oxygen percent in the pore space. The period modelled is 10 days. The selected "peak" aeration rate in the design is 5.5 cfm/cy and is available for the first 3 days of retention time. After that the selected "average" aeration rate of 3.5 cfm/cy will be available for the rest of the retention time.

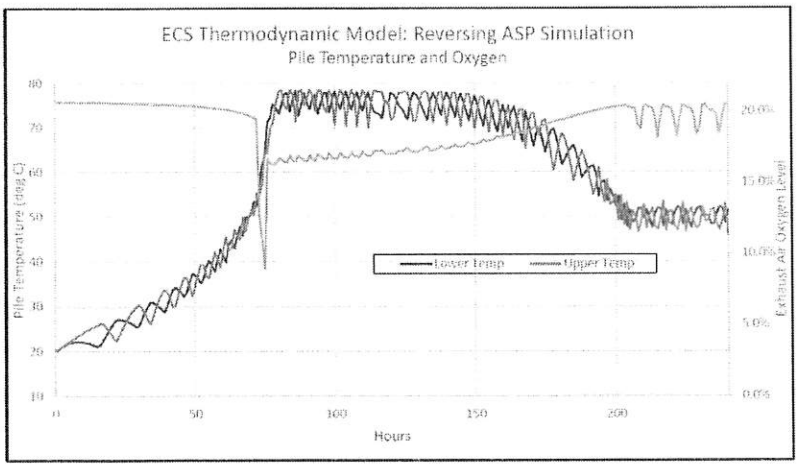


Figure 8 – ECS Thermodynamic Model

The oxygen levels calculated by the model are consistent with what is found in peer-reviewed science and in practice. That is, oxygen levels are assured to be high in an aerated system that has adequate air-flow rates to provide a reasonable amount of pile cooling. A well-aerated process will consume only a small percentage of the oxygen available in the air stream. Figure 9 is from Sundberg's (2005) PhD thesis; it shows that surplus oxygen is available in a forced aeration system over a wide range of temperature set-points. Even at the high temperature (70°C) (lowest aeration rate) roughly 70 percent of oxygen in the incoming air is present in the exhaust air. At the higher aeration rates, required to limit the temperature to a more optimal 55°C and 37°C, over 90 percent of the oxygen remains in the exhaust air. This model has been verified in-situ at the LCF.

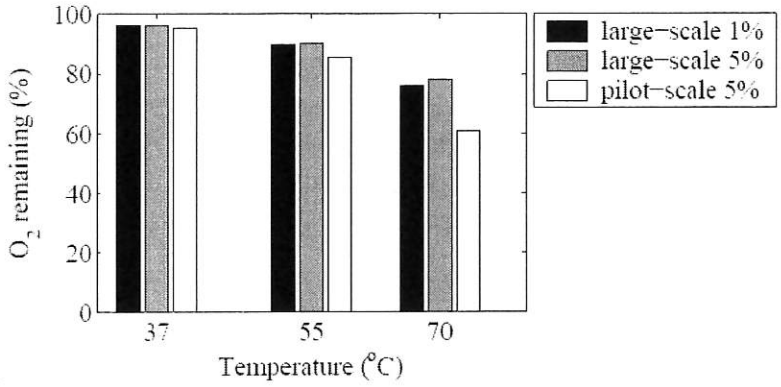


Figure 9 – Residual oxygen in the ASP airstream

For this reason frequent oxygen measurements are not necessary in a system with forced aeration and the ability to limit temperature rise which enacts a cooling trend in the first week or two. Oxygen sampling was conducted at the Lenz facility in 2013 in Zone 4 and Zone 7, which held material at 2 days retention and 12 days retention, respectively. The oxygen concentrations measured in the pore air averaged 18.5% (20.9% is ambient). These findings are consistent with Sundberg's research. The same oxygen levels will be measurable in the Lenz Phase II CASP upgrade.

As mentioned above, the pile temperatures largely control the ability of the oxygen to dissolve into the water film layer (biofilm) on the composting particles (moisture is a pre-requisite for active composting). Compost process researchers Sauer & Crouch (2013) at the UK Environment Agency published the date shown in Figure 10, along with the guideline of keeping oxygen saturation levels in the film layer above a minimum of three ppm in order to limit anaerobic conditions and minimize odor production in the pile.

The figure shows the inverse relationship between temperature and oxygen saturation in water; higher temperature means lower oxygen concentrations that can remain dissolved in the film layer on the

decaying compost surface. The design basis for the ECS aeration system in the Phase II CASP is to maintain process temperatures and oxygen levels that correspond to the range shown in the blue oval in the table below 90% of the time. The results of the ECS Thermodynamic Model, shown above, indicate that the CASP system will maintain these target conditions at least 90% of the time.

Saturation O2 concentrations in water mg/l (ppm)

O2 partial pressures (%) vs temperature (C)

	68F		86F		104F		122F		140F		158F		176F
O2	20°C	25°C	30°C	35°C	40°C	45°C	50°C	55°C	60°C	65°C	70°C	75°C	80°C
20%	9.17	8.32	7.57	6.91	6.33	5.81	5.35	4.94	4.57	4.24	3.94	3.67	3.42
19%	8.71	7.90	7.19	6.57	6.01	5.52	5.08	4.69	4.34	4.02	3.74	3.48	3.25
18%	8.25	7.49	6.82	6.22	5.70	5.23	4.82	4.44	4.11	3.81	3.54	3.30	3.08
17%	7.80	7.07	6.44	5.88	5.38	4.94	4.55	4.20	3.88	3.60	3.35	3.12	2.91
16%	7.34	6.66	6.06	5.53	5.06	4.65	4.28	3.95	3.65	3.39	3.15	2.93	2.74
15%	6.88	6.24	5.68	5.18	4.75	4.36	4.01	3.70	3.43	3.18	2.95	2.75	2.57
14%	6.42	5.82	5.30	4.84	4.43	4.07	3.75	3.46	3.20	2.96	2.76	2.57	2.39
13%	5.96	5.41	4.92	4.49	4.11	3.78	3.48	3.21	2.97	2.75	2.56	2.38	2.22
12%	5.50	4.99	4.54	4.15	3.80	3.49	3.21	2.96	2.74	2.54	2.36	2.20	2.05
11%	5.04	4.58	4.16	3.80	3.48	3.20	2.94	2.72	2.51	2.33	2.16	2.02	1.88
10%	4.59	4.16	3.79	3.46	3.16	2.91	2.68	2.47	2.28	2.12	1.97	1.83	1.71
9%	4.13	3.74	3.41	3.11	2.85	2.62	2.41	2.22	2.06	1.91	1.77	1.65	1.54
8%	3.67	3.33	3.03	2.77	2.53	2.32	2.14	1.98	1.83	1.69	1.57	1.47	1.37
7%	3.21	2.91	2.65	2.42	2.22	2.03	1.87	1.73	1.60	1.48	1.38	1.28	1.20
6%	2.75	2.50	2.27	2.07	1.90	1.74	1.61	1.48	1.37	1.27	1.18	1.10	1.03
5%	2.29	2.08	1.89	1.73	1.58	1.45	1.34	1.23	1.14	1.06	0.98	0.92	0.86
4%	1.83	1.66	1.51	1.38	1.27	1.16	1.07	0.99	0.91	0.85	0.79	0.73	0.68
3%	1.38	1.25	1.14	1.04	0.95	0.87	0.80	0.74	0.69	0.64	0.59	0.55	0.51
2%	0.92	0.83	0.76	0.69	0.63	0.58	0.54	0.49	0.46	0.42	0.39	0.37	0.34
1%	0.46	0.42	0.38	0.35	0.32	0.29	0.27	0.25	0.23	0.21	0.20	0.18	0.17
0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

kH for O2 in H2O
0.0013
(l atm / mole)

van't Hoff constant
1700
(°K)

6 ppm and above

5 to 5.99 ppm

4 to 4.99 ppm

3 to 3.99 ppm

2 to 2.99 ppm

1 to 1.99 ppm

0 to 0.99 ppm

Figure 10 - Inverse relationship of temperature and oxygen saturation in water. (Chart excerpted from Sauer & Crouch (2013) Biocycle article.)

Aeration Flow Direction (Reversing)

The Lenz Phase II upgrade will use reversing aeration to control and cool the compost process just as the current system operates. Reversing aeration systems have the ability to push air through the floor and into the bottom of piles as well as draw air down through the top of the pile and into the floor. Reversing aeration ensures a more homogenous process throughout the pile as compared with single direction aeration where a substantial temperature gradient exists between the top and bottom of the compost piles.

During negative aeration, the process air is drawn through the fan and pushed into the biofilter. During positive aeration the process air is pushed through the insulative cover layer (bio-cover layer) which is used for VOC and odor mitigation and vector attraction reduction.

The bio-cover layer provides a degree of scrubbing prior to the exhaust air escaping out the surface of the piles. Figure 11 illustrates both directions of air with green for positive aeration and red for negative aeration. The CompTroller™ control system measures pile temperature at two different depths in each zone; when the actual temperature difference between the sensors at two different depths is greater than the user defined set point (i.e. 5C) the aeration direction is automatically switched and the temperature difference is eliminated and eventually reversed resulting in another change in aeration direction.

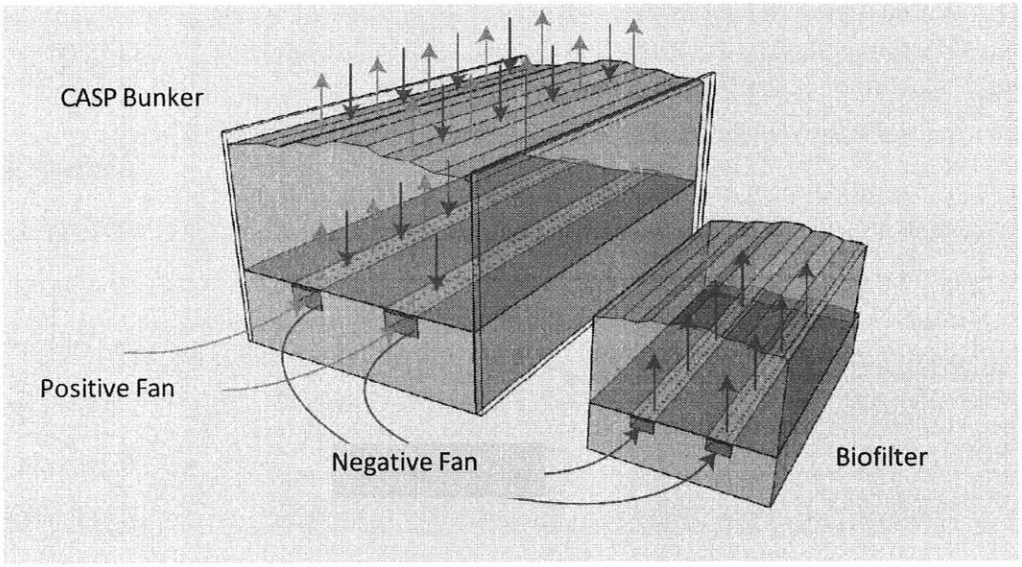


Figure 11 - CASP Air flow

Automated Process Control

Given the highly variable nature of compost heat generation the advantages of a dynamic aeration system can best be realized with an automated control system that uses real-time temperature feedback to modulate the rate and direction of the air-flow. The ECS CompTroller™ provides real-time control for each zone independently, as well as controlling the temperature of air going to the biofilter.

Time and temperature data from each batch is displayed and recorded for regulatory compliance. In addition the ECS CompTroller™ monitors and permanently logs a suite of process variables and control statuses for devices including fans, dampers and irrigation systems. Operators select a sequence of temperature set-points, aeration system settings, irrigation settings, and process goals for up to four sequential control regimes. As the process goals are achieved, the system automatically moves to the

next control regime. The system can be accessed remotely for management and support, and can record system errors that might occur.

Uniformity of Aeration

Adequate forced aeration in a composting mass can be limited by un-even aeration both within a single zone and between various zones with a central aeration system. To ensure that this condition does not occur ECS-designed air distribution plenums that run along the back wall of the ASP are designed and constructed to be largely in compliance with current HVAC duct design standards to both limit un-even aeration and to conserve energy.

ECS adheres to the following basic design standards when developing an aeration system for an ASP:

- Maximum duct velocity: 3,200 feet per minute
- Maximum operating pressure: +/- 10" H2O
- Minimum Positive Fan Design Efficiency: 500 CFM/HP
- Minimum Negative Fan Design Efficiency: 375 CFM/HP

The Lenz CASP aeration floors will be designed to promote uniform air distribution in their loaded state. The peak aeration rates for different zones can be measured and compared by measuring the airspeeds in the plenums on either side of a zone. The distribution of air flow through a loaded aeration floor can be inferred through mathematical modelling and oxygen distribution in pile.

The output model of the ECS aeration floor design for the Lenz Phase II CASP is shown in Figure 12:

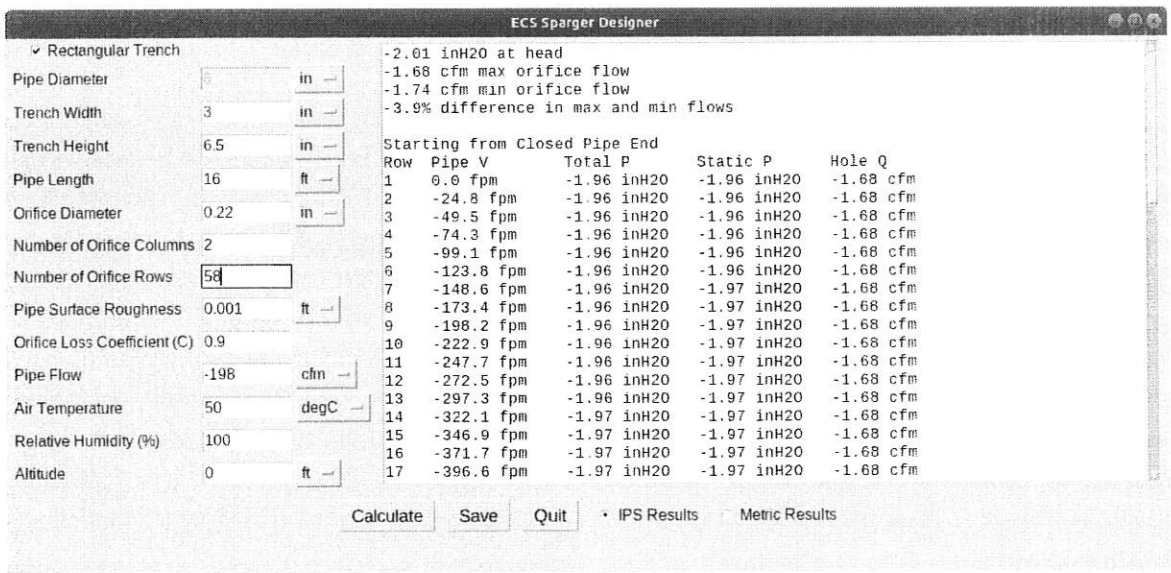


Figure 12 - Output LCF Aeration Floor Output

Primary Composting Retention Time (ASP)

The Phase II ASP will be capable of delivering optimum results with retention times between 10 and 15 days for primary composting depending on the season and related feedstock density. The primary goal of the CASP is to create an environment where the compost reaches time and temperature requirements of a minimum 55C for 72 hours. Also important in primary composting is to achieve substantial stabilization where the majority of emissions can be captured and scrubbed through the fixed biofilter or bio-cover layer on the surface of the pile.

Emission Control

Biofilters for the Lenz CASP have been sized to ensure sufficient residence time of compost process air within the volume of the biofilter media. The ideal media is made from spears of shredded wood with a low percentage of finished compost mixed in to boost the microbial populations living on the wood surfaces. As compost process air passes through the voids of media, interactions occur between odorous organic compounds entrained in the exhaust air stream and the surfaces of the biofilter media.

The odorous chemicals dissolve into the wet layer of the media and are consumed by the micro-organisms living there. The greatest scrubbing performance occurs with EBRTs of 15 - 60 seconds (UK Environment Agency – Biofilters, page 25) depending on chemical loading rates and conditions, beyond which the performance gains fall away rapidly. The EBRT for the Lenz Phase II design will be 50 seconds, which is near the upper end of the range and has been found to be effective in previous ECS installations.

V. Summary

Lenz Enterprises has been composting organics feedstocks successfully since 2008. Lenz proposes to expand their compost facility to process up to 150,000 tons annually. Expanded operations will include additional Aerated Static Pile (ASP) and windrow processing, modified curing process, environmental controls and enhanced site operation and maintenance. Operating hours will expand from six hours a day five days a week, to 10 ½ hours a day six days a week. Smaller packer trucks will be mitigated from the delivery regime and replaced with larger 30 tons loads which will reduce overall truck traffic to the site. Proposed primary processing systems have been designed by 02 Compost and Engineered Compost Systems (ECS) both of which designed the existing Lenz Compost Facility. Structural design and calculations have been prepared by King Works, a professional structural engineering design company. Proposed operations will use the same successful design and operation strategies that have worked well for Lenz for the past 10 years. No significant impact to human health or the environment is anticipated from this proposal.

VI. Engineering Certification Page

Certification Statement:

This engineering report has been prepared by Peter Moon, P.E.; a professional civil engineer registered in the State of Washington license number 24640 issued October 30, 1987 and expiring June 14, 2019. This engineering report addresses the design standards of subsection (4 and (5) of WAC 173-350-220.

Peter Moon, P.E. will be responsible for ensuring that the proposed facility will be constructed in accordance with the approved engineering report, plans and specifications and will approve construction in writing.

STATE OF WASHINGTON
DEPARTMENT OF LICENSING - BUSINESS AND PROFESSIONS DIVISION
THIS CERTIFIES THAT THE PERSON OR BUSINESS NAMED BELOW IS AUTHORIZED AS A

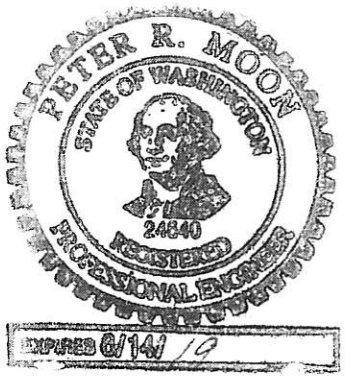
PROFESSIONAL ENGINEER
CIVIL

PRICE-MOON ENTERPRISES, INC.
PETER R MOON
PO BOX 1026
SNOHOMISH WA 98291

24640	10/30/1987	06/14/2019	Pat Kohler
License Number	Issued Date	Expiration Date	Pat Kohler, Director

Signature: _____ 2.19.19

Peter R. Moon



Appendix A: Construction Quality Assurance Plan

Purpose

This Construction Quality Assurance Plan provides assurance that during and after construction the design specified in the engineered plan has been followed.

General Construction - Inspection Items:
Specifics of design to be checked are listed below. These will be checked to assure that installation is completed as designed.

- Grading and pavement sections
- Structural components including ASP bay footers and walls;
- Aeration System, as provided by Engineered Compost Systems of Seattle;
- Leachate collection and conveyance structures;
- Placement of blowers and process control systems to assure proper operation; and
- Other conditions as specified by the Engineer.

Inspecting Individual
Review of civil construction will be conducted by the licensed engineers and equipment suppliers who will review and stamp design work. The final Construction Quality Assurance Plan will be signed by Peter Moon, P.E. along with the on-site QA/QC inspector who will be on-site throughout the construction phase of work. Construction oversight will not be done by someone performing the construction work.

Record Keeping
The inspector shall take legible notes during construction and will take pictures with a digital camera of the construction as it progresses. The inspector will prepare regular reports of progress completed, changes to the design and engineer's signed approvals, notes regarding unanticipated conditions, and copies of all written correspondence. Pictures and measurements will be taken during construction and an as-built drawing will be prepared and included in the final report.

Final Report
Following construction a report shall be prepared to summarize the construction process, findings of the inspection, and any deviations from the design and include photographs.

Construction
General construction outlined in this engineering report will be performed by Taylor's Excavating of Stanwood WA or a company with equivalent experience and equipment.

Demonstrated Compliance with Performance Standards
Composting facilities must be design and construction such that the facility can be operated to meet the performance standards of WAC 173-350-040. This includes design, construct, operate, close and provide post-closure care as applicable, at any solid waste facility in a manner that does not pose a threat to human health or the environment. The Lenz Compost Facility has been located in an area

without critical areas, critical aquifer recharge issues, or any other compromised environmental situation. The site is located above a thick layer of unsorted glacial sediment (Glacial till) which ensure no contaminant migration should contaminants be released on site.

As described within the text of this engineering report, Best Available Control Technology (BACT) has been employed to protect air quality, all stormwater is captured treated and reused in the composting process, and the composting system has been designed to minimize energy consumption and other impacts to the environment. Post-closure care is assured through a Department of Natural Resources (DNR) reclamation bond to reclaim the entire site should mining and ancillary activities cease to operate.

Composting facilities must not be in conflict with the approved local comprehensive solid waste management plan prepared in accordance with chapter 70.95 RCW, Solid waste management—Reduction and recycling, and/or the local hazardous waste management plan prepared in accordance with chapter 70.105 RCW, Hazardous waste management.

RCW 70.95 and local waste management plans prioritize the collection, handling and management of solid waste in the following descending order:

- Waste reduction;
- Recycling, with source separation of recyclable materials as the preferred method;
- Energy recovery, incineration, or landfill of separated waste;
- Energy recovery, incineration, or landfill of mixed municipal solid wastes.

The primary function of the Lenz Composting Facility is to recycle organic residuals diverting them from becoming landfill waste. The LCF currently recycles 75,000 tons per year and through this proposal will recycle 150,000 tons per year.

The Lenz Compost Facility has complied with all applicable local, state and federal laws and regulations for over 10 years. Expanded operations will include similar operational strategies and managements to continue this compliance.

Covered Aerated Static Pile (CASP) - Inspection Items:

Construction of the Covered Aerated Static Pile system will be inspected by ECS technicians and engineers as required during the construction cycle. These observations provide intermittent checks of general conformance to the design intent.

No.	Parameter	Unit	Required Criteria/Value	Objective	Method	Item to be Tested
1.	Leachate collection piping – leak test	inches	< 0.5" of water level drop in 24-hours	Ensure leachate collection pipe system is effectively water-tight so that pressure trapping sumps work as designed	Plug level controlling sump outlets, fill sump to a level that will test all pipe connections with water. Test both before and after concrete pour.	All underground piping designed to hold water
2.	Concrete quality – slope & flatness	Observation	Bunker floors shall have no end-end slope & no side- side slope (<.25% in either direction)	Control surface water and avoid ponding	Use survey or laser level to confirm grades	Each Bunker Zone
3.	Duct leakage	Observation	No visual, audible, or hand- perceptible air leaks	Maximize efficiency of the aeration system by minimizing leakage	Visual inspection while system is operating near full pressure.	All exposed air ducts
4.	Bunker Aeration Trench – Trench Cover Recessed Below Grade	Inches	0.25 to 0.50	Ensure drain trench covers are recessed below working pad and prevent interference with loader blade.	Depth gauge	Each aeration trench cover
5.	Temperature Sensor - Accuracy	Celsius	+/- 1°	Ensure accuracy of sensors	Calibrated temperature probe in isothermal mass (bucket of water, etc.)	Each sensor
6.	Pressure Transducers - Accuracy	Inches of water column	+/- 25% at full range	Ensure accuracy of sensors	Low pressure digital manometer	Each sensor

7.	Peak Aeration System Performance	CFM (flow) per cubic yard of composting feedstock in a single mass bed/zone	TBD	Test for peak aeration rate in a single loaded bunker/zone	Hotwire anemometer duct traverse	Each bunker zone
8.	Minimum Aeration System Performance	CFM (flow) per cubic yard of composting feedstock in a single mass bed/zone.	TBD	Test of full system minimum rate of air flow simultaneously to all mass beds/zones	Hotwire anemometer duct traverse	Each bunker zone
9.	System Auto- Restart	Observation	System resumes normal operation after power interruptions or device faults	Ensure system will restart automatically after a power loss.	Power cycle at main breaker	Each fan set
10.	System Pressure Control	Fan RPM Duct pressure, inches W.C.	Fan output must follow output requirement and settle within 60 seconds of an incremental change	Ensure the feedback control of the fan speed is functional and does not oscillate in an unstable manner	Run fan groups through a series of tests where mass bed/zone aeration dampers apertures are changed and the system settling time is observed.	Each fan set
11.	Compost Temperature Control	Celsius	Observe damper aperture response to average mass bed temperature	Ensure the temperature feedback control of the dampers is functional, does not oscillate, drives the average temperature towards a smaller error.	Process compost batches and check data files that record temperatures and damper apertures to make sure system responds appropriately to the difference between temperature set points and measured temperatures.	Each bunker zone

12.	Bunker Top Cover Irrigation System	Observation	Irrigation system turns on/off at intended times and intervals	Ensure aeration zone surface irrigation system operates per the time-settings set in the control software	Verify irrigation control settings with a stop watch	Each bunker zone
13.	Irrigation System – Coverage	%	> 90% of top surface area	Irrigation system must wet most of the top cover surface area	Visual	Each bunker zone

Structural inspections, testing and structural observations

Structural inspections will be conducted by qualified staff from Kingworks Engineering or their qualified designated appointees.

Structural Inspection schedule and components are given below. Please refer structural engineering requirements for additional information.

--STRUCTURAL SPECIAL INSPECTION SCHEDULE--			
Item No.	STRUCTURAL ITEM	FREQUENCY (C=continuous, P-periodic)	REFERENCE (2015 IBC Section, uon)
1	Concrete		1705.3, Chap 26
	Reinf Placement	P (and prior to all pours)	Table 1705.3
	Anchor Placement	P (and prior to all pours)	Table 1705.3
	- Concrete Placement	C	Table 1705.3
	- Concrete Testing	Per ACI 318-14 Sec 26.12	Table 1705.3
2	POST-INSTALLED ANCHORS		Table 1705.3
	- Epoxy or Adhesive Anchors Used in Horizontal or Overhead Position	C	See ICC-ES report
	- All Other Anchors Installed in Hardened Concrete	P (except where C req'd by ICC-ES report)	See ICC-ES report
3	SOILS & FOUNDATIONS		1705.6, Table 1705.6, Geotech Report
	- Subgrade Adequacy	P (beneath fill and/or foundations)	P (beneath fill and/or foundations)
	- Excavation Depth	P	Table 1705.6
	- Fill Materials	P	Table 1705.6
	- Fill Placement & Compaction	C	Table 1705.6

-- SPECIAL INSPECTIONS, TESTING, AND STRUCTURAL OBSERVATION --
STRUCTURAL OBSERVATION: Kingworks will perform structural observations in accordance with IBC Section 1704.6 as required. These observations provide intermittent checks of general conformance to the design intent and are in addition to (not replacing) the third-party special inspection regimen. It shall be the Contractor's responsibility to keep the Structural Engineer apprised of the general schedule of construction, such that observations may be made at appropriate stages before significant structural components (such as reinforcing bars, framing members, or wall hold-downs) are obscured.

Appendix B: Calculations

Annual Precipitation/Water Balance

WATER CONSUMPTION
CALCULATED BY HAROLD RUPPERT
NOVEMBER
BASIS 150,000 TONS PER YEAR FEEDSTOCK
CALCULATIONS ARE BASED UPON
PRACTICAL HANDBOOK OF COMPOST ENGINEERING, ROGER T HAUG.
CALCULATED NUMBERS IN BLUE

300,000	FEEDSTOCK YD3/YR	
150000	FEEDSTOCK TONS/YEAR	
99000	FEEDSTOCK TONS/YEAR OD SOLIDS	
800	LBS/YD3 FEEDSTOCK	
1600	LBS/YD3 COMPOST PRODUCT	
2000	LBS/TON	
0.4	SOLIDS FRACTION FEEDSTOCK	
0.6	SOLIDS FRACTION PRODUCT	
0	C TEMPERATURE OF INCOMING MATERIAL	
55	C TEMPERATURE OF COMPOST PRODUCT	
0.3	FRACTION ASH CONTENT FEEDSTOCK	
0.7	FRACTION VOLATILE SOLIDS, DRY WT BASIS, FEEDSTOCK	
0.65	FRACTION BIODEGRADABILITY FEEDSTOCK DRY BASIS	
565.7	LATENT HEAT OF VAPORIZATION WATER CAL/G	
613655.6	LATENT HEAT OF VAPORIZATION WATER KCAL/TON	
2141.94	LATENT HEAT OF VAPORIZATION WATER KCAL/GAL	
908	KCAL/TON C,HEAT CAPACITY OF WATER AND FEEDSTOCK	
3600	CAL/G UNIT OF HEAT RELEASE, BIODEGRADABLE VOL SOLIDS, HAUG	
3268800	KCAL/TON BIODEGRADABLE VOLATILE SOLIDS, HAUG	
97500	WATER IN TONS/YR	
99000	TOTAL OUT TONS/YR	
99000	TOTAL WT COMPOST OUT TONS/YR	
45000	WATER OUT TONS/YR	

ENERGY GENERATED
89,928,960,000.00 KCAL/YR HEAT GENERATED BY BIOLOGICAL OXIDATION OF FEEDSTOCK

INPUT

300,000	YD3	TOTAL ANNUAL FEEDSTOCK
1000	LBS/YD3	BULK DENSITY TOTAL FEEDSTOCK AVERAGE
0.5		SOLIDS FRACTION IN FEEDSTOCK
0.6		SOLIDS FRACTION IN PRODUCT
0.2		FRACTION ASH CONTENT
0.8		FRACTION VOLATILE SOLIDS, BASED ON ASH
0.6		FRACTION BIODEGRADEABLE
0	C	INCOMING FEEDSTOCK TEMPERATURE
55	C	OUTGOING PRODUCT TEMPERATURE
565.7	CAL/GRAM	LATENT HEAT OF VAPORIZATION, WATER 55 C
3600	CAL/GRAM	HEAT RELEASE FROM BIODEGRADEABLE SOLIDS

SOURCE OF INFORMATION
Lenz Enterprises Inc, anticipated volumes
Target bulk density
Estimate based upon experience and observation of lenz Feedstocks
Target solids fraction
Estimate based upon experience and observation of lenz Feedstocks
Estimate based upon experience and observation of lenz Feedstocks
Garden Debris, Haug, Page 308
Estimate
Estimate
Haug Page 293
50% biosolids,5560 cal/g 50% wood 3060 cal/g @80% solids, Haug page 104

K_S	FRACTION	0.65	Fraction of total feedstock volatile solids degradable under composting	ORG	0.65
V_S	FRACTION	0.8	Volatile solids content of total feedstock, fraction of dry solids		0.7
S_S	FRACTION	0.35	Fractional solids content of total feedstock		0.4
X_S	TONS	150,000	Wet weight of total feedstock per year		
$BVS = K_S V_S S_S X_S$			Biodegradable Volatile Solids feedstock		
$NBVS = (1-K_S)V_S S_S X_S$			Nonbiodegradable Volatile Solids feedstock		
$ASH = (1-V_S)S_S X_S$			Ash inert components feedstock		Volatile Matter
$WAT = X_S - S_S X_S$			Water Component feedstock		

INCOMING FEEDSTOCK

BVS =	29475	TONS/YR	$q_s = mc_p T change$
NBVS =	11025	TONS/YR	m = mass q = energy c = heat capacity
ASH =	21000	TONS/YR	
WAT =	97500	TONS/YR	
		1 CAL/GRAM C	908 KCAL/TON C

ENERGY NEEDED

28,966,619,900.00	KCAL/YR	EVAPORATION OF WATER
4,494,600,000.00	KCAL/YR	HEATING OF SOLIDS BASED UPON 1 CAL/GRAM HEAT CAPACITY
2,656,691,500.00	KCAL/YR	HEATING OF AIR AND GENERATED GAS, 10% OF ENERGY NEEDED TO EVAPORATE
34,158,210,900.00	KCAL/YR	TOTAL KCAL USED

ENERGY DIFFERENCE

32,770,469,100.00	KCAL/YR	
15,299,406.22	GAL/YR	GALLONS OF ADDITIONAL WATER EVAP POTENTIAL

ENERGY DIFFERENCE

15,299,406.22	GAL/YR	AVAILABLE KCAL AFTER EVAPORATION AND HEATING,
9,944,614.05	GAL/YR	AVAILABLE EVAPORATION ASSUMING 65% OF ENERGY GOES TO EVAPORATION
65%		Energy going to evaporation

Storm Event/Water Balance

CALCULATIONS ARE BASED UPON WESTERN REGION CLIMATE CENTER, RECORD OF MONTHLY CLIMATE, AVERAGE TOTAL PRECIPITATION
CALCULATED NUMBERS IN BLUE

277,000.00	SQUARE FEET OF COLLECTION AREA	TOTAL FT2 WITH PTOPOSED EXPANSION AND POND
35.00	INCHES OF RAINFALL PER YEAR	
2,142.00	KCAL/GAL ENERGY NEEDED FOR EVAPORATION OF ONE GALLON	
66,928,680,000.00	KCAL RESIDUAL ENERGY AVAILABLE PER YEAR FOR WATER EVAPORATION	
6,043,216.67	GALLONS OF OF RAINFALL COLLECTED PER YEAR	
9,944,614.05	TOTAL GALLON EVAPORATION CAPACITY ASSUMING 65% OF ENERGY GOES TO EVAPORATION	
3,901,397.38	GALLONS OF EXCESS WATER EVAPORATION POTENTIAL PER YEAR, AFTER PRECIPITATION EVAPORATION	

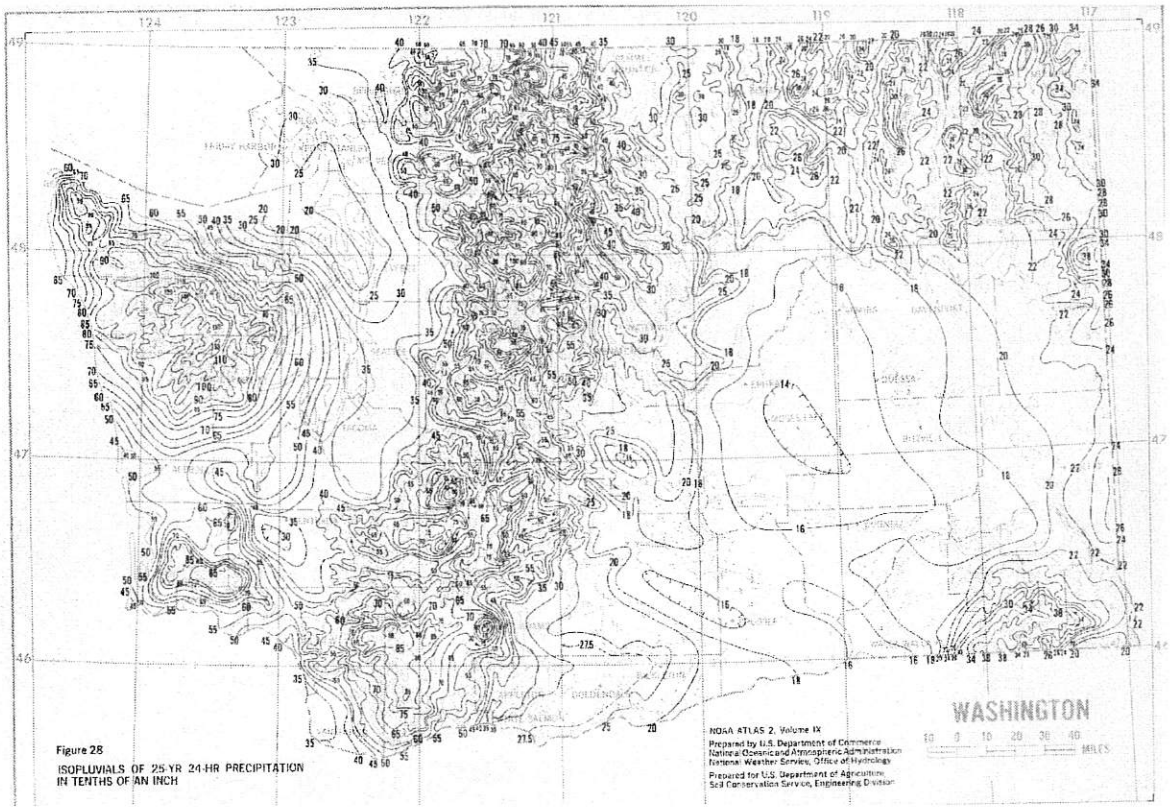
WATER 24 HOUR 25 YEAR STORM EVENT

277,000.00	SQUARE FEET OF COLLECTION AREA	
2.50	RAIN 24 HOUR 25 YEAR STORM EVENT	https://wrcc.dri.edu/Climate/precip_freq_map_show.php?simg=wa25y24.gif
431,658.33	GALLONS OF OF RAINFALL COLLECTED	

NOVEMBER

277,000.00	SQUARE FEET OF COLLECTION AREA	
8.15	RAIN 24 HOUR 25 YEAR STORM EVENT	
1,407,206.17	GALLONS OF OF RAINFALL COLLECTED	

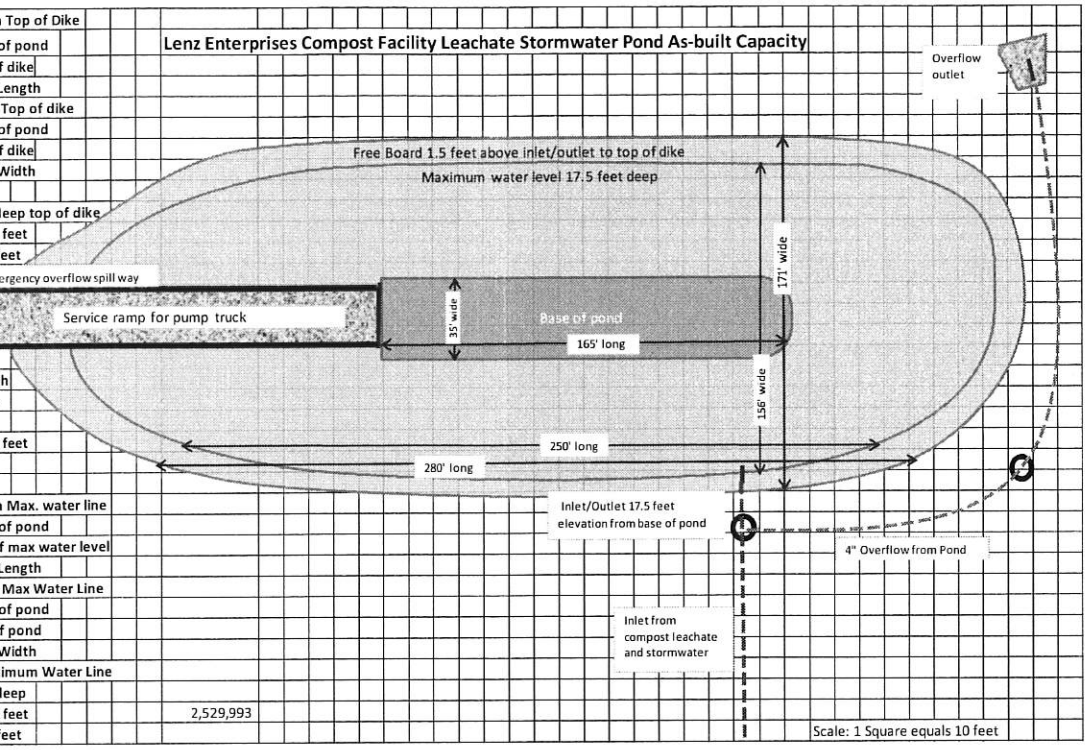
NOAA Isopluvials of 25-yr 24-hr precipitation



Leachate Stormwater Pond Configuration

Average Length Top of Dike	
165	base of pond
280	top of dike
222.5	Avg. Length
Average Width Top of dike	
35	base of pond
171	top of dike
103	Avg. Width
Volume	
19	feet deep top of dike
426883	cubic feet
9.80	acre feet
Service ramp	
114	Length
30	Wide
2.5	High
8550	cubic feet
Capacity	
Average Length Max. water line	
165	base of pond
250	top of max water level
207.5	Avg. Length
Average Width Max Water Line	
35	base of pond
156	top of pond
95.5	Avg. Width
Volume at Maximum Water Line	
17.5	feet deep
338234	cubic feet
7.76	acre feet

2,529,993



Liftstation Pipe Size Calculations

				PIPELINE SIZING CALCULATION		
				CLIENT: Phase II	LINE NO.: Leachate	
REV	PREPARED BY	DATE	APPROVAL	W.O.: 0	REQUISITION NO.	SPECIFICATION NO.: 18103
0	E. Wheeler	19-Dec-2018		UNIT: Influent AREA: Liftstation	PROCURED BY	INSTALLED BY
1						
2						

1	**General**		
2	Fluid Service		***Raw Material Transfer***
3	Pipe Specification		***H1: CPVC Pipe***
4	Surface Roughness	(feet)	***0.000005***
5	Insulation		***None***
6	Ambient Temperature	(deg F)	***50***
7			
8	**Process Data**		
9	Fluid Pumped		***Water (liquid)***
10	Design Flow Rate	(gallons/minute)	***100***
11	Maximum Flow Rate	(gallons/minute)	***187.5***
12	Flowing Temperature	(deg F)	***20***
13	Nominal Pressure	(psia)	***14.7***
14	Specific Gravity		***1.009534714*** *(= 62.99 lb/cu.ft.)*
15	Viscosity	(centipoise)	***1.940165108***
16			

Basis for Sizing: Specified Diameter @ 4 inches

	Nom. Size	Sched	O.D. (in.)	Wall (in.)	I.D. (in.)	Reynolds Number	Friction Factor	Pressure Drop/100 equiv ft (psi)	(ft water)	(ft liq)	Velocity (ft/sec)
	3	80	3.500	0.300	2.900	5.67E+04	0.0203	*1.35*	3.11	3.08	4.86
===>	***4***	80	4.500	0.337	3.826	4.29E+04	0.0216	***0.36***	***0.83***	0.82	***2.79***
	4	80	4.500	0.337	3.826	4.29E+04	0.0216	*0.36*	0.83	0.82	2.79

Physical Layout

90 deg Ell	5	TEE-Line Flow	-	Globe Valve	-	Plug Valve	-
Long Rad. Ell	-	TEE-Brnch Flow	-	Gate Valve	2	Angle Valve	-
45 deg Ell	-	Bell Mouth Inlet	-	Ball Valve (red. port)	-	Swing Check Valve	-
180 deg Bend	-	Sq. Mouth Inlet	-	Butterfly Valve	-	Re-Entrant Pipe	-

Straight Feet of Pipe (measured through centerline of fittings): ***150*** feet

Heat Loss

	Nom. Size		units	Pipe is Uninsulated: Bare	0.5 in	1 in	1-1/2 in	2 in	3 in
	3		Btu/hr-ft	(22)	n/a	n/a	n/a	n/a	n/a
===>	4		Btu/hr-ft	(26)	n/a	n/a	n/a	n/a	n/a
	4		Btu/hr-ft	(26)	n/a	n/a	n/a	n/a	n/a

Summary of Results

	Nom. Size	Eq Lgth (ft)	Pressure Drop (psi)	(ft water)	(ft liq)	Heat Loss (Gain), But/hr: Bare	0.5 in	1 in	1-1/2 in	2 in	3 in
	3	186	2.50	*5.78*	5.7	(3,332)	n/a	n/a	n/a	n/a	n/a
===>	4	191	0.68	*1.57*	1.6	(3,862)	n/a	n/a	n/a	n/a	n/a
	4	191	0.68	*1.57*	1.6	(3,862)	n/a	n/a	n/a	n/a	n/a

Material Treatment Capacity Calculations

Tipping Building		
Increase in working hours		
6	hrs	day
10.5	hrs	day
30	hrs	week
63	hrs	week
210%	Increase	week
1,442	tons	current weekly capacity
3,029	tons	incrased weekly capacity
157,500	tons	annual capacity with increased hrs
Diversion of clean feedstocks		
35%		
26250	tons	increased capacity
183,750		annual capacity with increased hours and clean feedstock diversion

Phase I - ASP Modification

75,000	tons	Current annual capacity
17,000	sq ft	Current ASP floor
22,000	sq ft	New ASP floor
129%	%	increase in floor area
97,059	tons	processing capacity of new ASP
172,059	tons	Total processing capacity (new and existing ASP)

Phase II - Windrow Composting

21,333	cy	MassBed Volume
72,000	sf	MassBed Area
8	ft	Pile height
1.65	acres	MassBed Area
177,000	sf	Phase II
4.06	Acres	Phase II
7848	cy	per acre of windrow
5.72	acres	Phase I & II
44,861	cy	Windrow Volume Phase I & II
2.10	x	Increase in volume capacity

Cat 980 Loader Ground Weight Calculations

CAT – 980M

Operating Weight 30,090 kg (66,337 lb.)

Weight based on a machine configuration with Michelin 29.5R25 XLDD1 L4 radial tires, full fluids, operator, standard counterweight, cold start, roading fenders, Product Link, open differential axles (front/rear), secondary steering, sound suppression, and a 5.4 m3; (7.1 yd3) general purpose bucket with BOCE.

Operating Specifications – 980M Static Tipping Load – Full 40° Turn

With Tire Deflection	19 565 kg	43.133 lb
No Tire Deflection	20 796 kg	45,847 lb

Equal axle distribution

66337	980F Loader - fully loaded	
33168.5	per xle	(assumming equal loading)
810	sq inches	per wheel touching
1620		both wheels
20	PSI	

60/40 axle distribution

66,337	980M Loader - fully loaded	
39,802	per xle	(assumming equal loading)
810	sq inches	per wheel touching
1,620		both wheels
25	PSI	

Pneumatic mixing calculations/Pump Cycle – PS2

Pneumatic Mixing Power Requirements
Leachate Treatment Tank

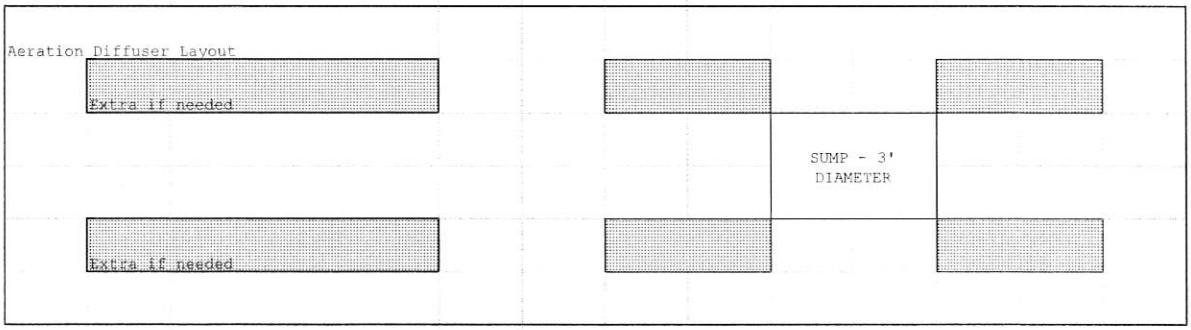
Lift station
P= power dissipated, kW
pa= atmospheric pressure, kN/M2
Va= volume of air at atmospheric pressure, m3/s
Pc= air pressure at point of discharge, kN/M2

P= pa x Va x ln (Pc / Pa)

		Units	Conversion Factor		
P=	3.4866	kW	1.34102	4.6756	HP
pa=	0.10133	kN/M2			
Va=	0.08872	m3/s	0.00047	188	SCFM
Pc=	39.3001	kN/M2	6.89476	5.7	PSIG

Influent Tank

Floor area	Depth
6', 8" x 12' 8"	8' 1"



Floor area	6.67	Feet
	12.67	Feet
	84.44	Sq Ft
Depth (main area)	8.08	Feet
Depth (sump area)	8.08	Feet
Tank volume	682.59	Sq ft
Tank volume	5105.79	gallons
Sump volume	7.06	Sq ft
Sump volume	158.63	gallons
Total volume	689.65	Sq ft
Total volume	5264.42	gallons

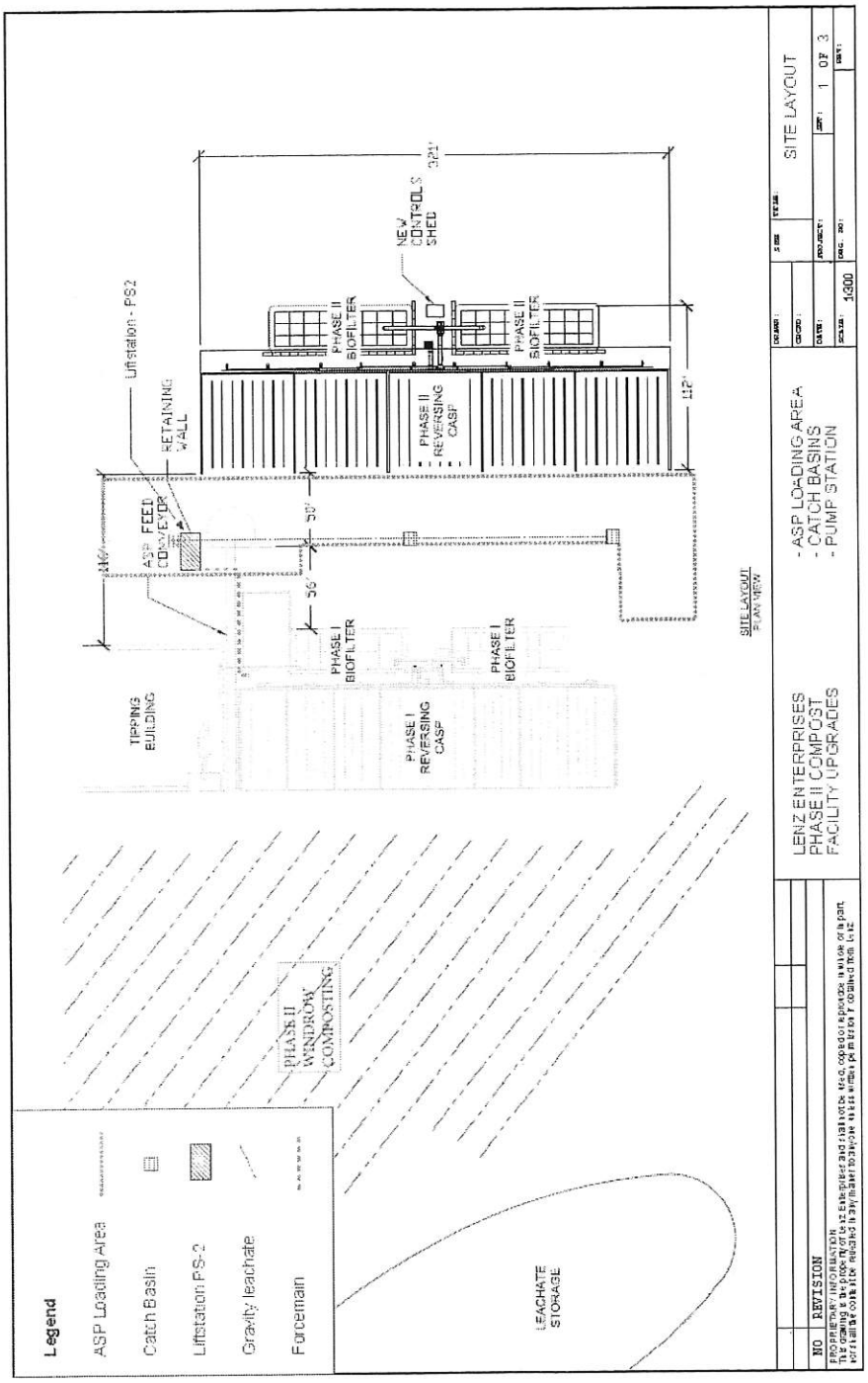
$V = \pi r^2 h$

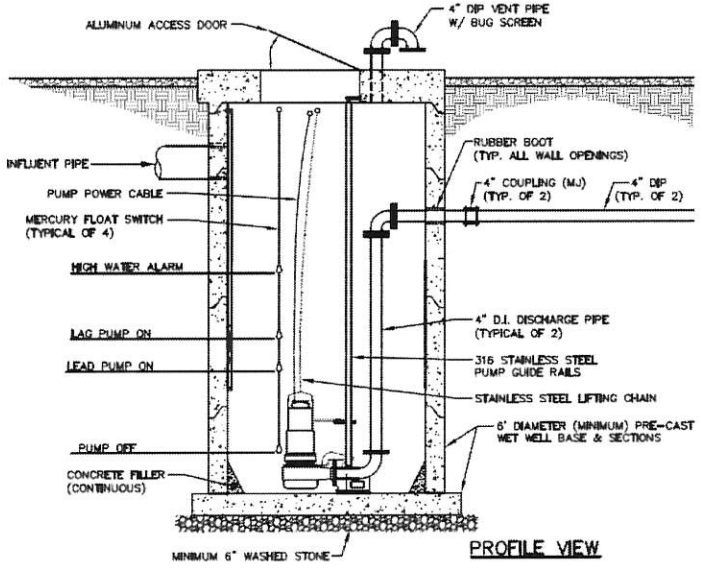
Pump cycling

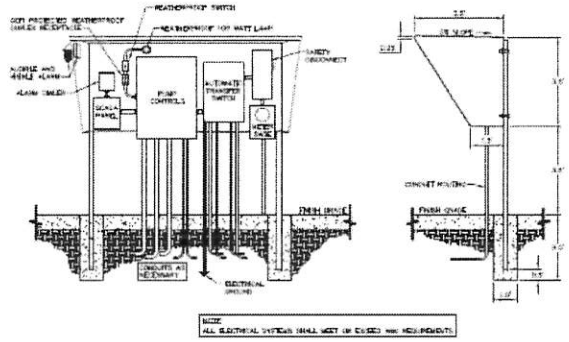
V = tQ/4, where
V = minimum volume (gallons)
t = minimum time between pump starts
Q = pump capacity (gallons/minute)

V =	187.5
t	5
Q	150

Appendix C: Graphics







ELECTRICAL RISER

NOTES:

1. PUMP STATION SHALL MEET ALL STATE MINIMUM DESIGN REQUIREMENTS AND BE APPROVED BY SITE CIVIL ENGINEER.
2. WET WELL SHALL BE EPOXY COATED OR USE A PERMEABILITY REDUCING ADMIXTURE (PRA).
3. FORCEMAIN CONVEYANCE PIPE WILL BE HDPE WITH MINIMAL BREAKS. CONNECTIONS WILL BE WELDED AS NECESSARY IN THE FIELD.
4. PIPE AND VALVE SIZES SHOWN ARE MINIMUM SIZES. ACTUAL SIZES WILL BE DETERMINED BY SITE CIVIL ENGINEER.
5. ELECTRICAL RISER AND PUMP STATION CONTROLS WILL BE PRE-ENGINEERED TO MATCH PUMP STATION REQUIREMENTS.

WET WELL AND VALVE VAULT

NO.	REVISION

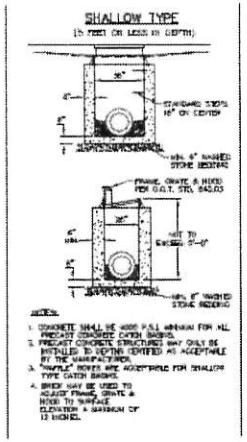
LENZ ENTERPRISES
PHASE II COMPOST
FACILITY UPGRADES

- PUMP STATION DETAIL
- PUMP STATION CONTROL

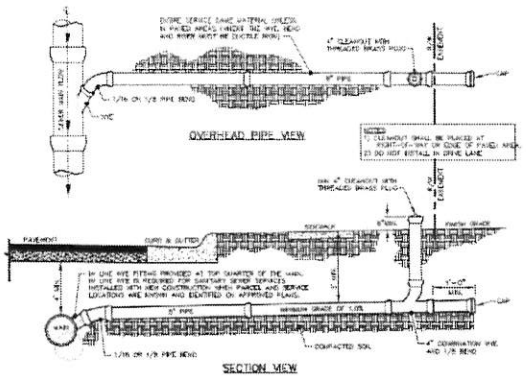
DRAWN:	SIZE:	TITLE:	PUMP STATION 2 GENERAL LAYOUT
CHKD:			
DATE:	PROJECT:	SHT: 2 OF 3	
SCALE: 1:300	DWG. NO:	REV:	

NOTES:

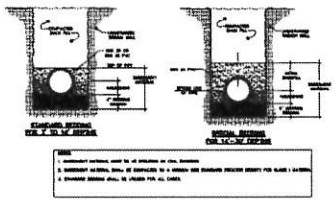
1. CATCH BASINS WILL BE PRE-ENGINEERED FOR COMPATIBLE USE
2. GRAVITY CONVEYANCE PIPE WILL BE SCHEUDLE 80 PVCUNLESS OTHERWISE SPECIFIED BY SITE CIVIL ENGINEER.
3. FORCEMAIN CONVEYANCE PIPE WILL BE HDPE WITH MINIMAL BREAKS CONNECTIONS WILL BE WELDED AS NECESSARY IN THE FIELD
4. SLAB SLOPES WILL BE MINIMUM 1% GRADE UNLESS OTHERWSIE SPECIFIED BY SITE CIVIL ENGINEER.
5. CONVETANCE CLEANOUTS WILL BE LOCATION OUTSIDE DRIVE LANES

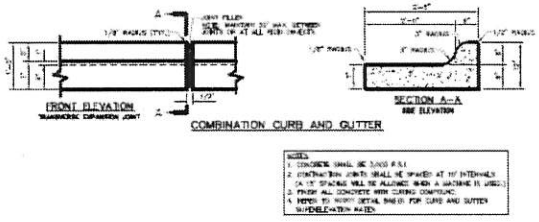


STANDARD PRECAST CONCRETE CATCH BASIN



STANDARD 8 INCH SANITARY SEWER SERVICE WITH TAP





NO.	REVISION

LENZ ENTERPRISES
PHASE II COMPOST
FACILITY UPGRADES

- LEACHATE CONVEYANCE SYSTEM DETAIL

DRAWN:	SIZE: TITLE: SITE LAYOUT
CHECKED:	
DATE:	PROJECT: SHT: 3 OF 3
SCALE: 1:300	DWG. NO. REV:

272-038-G01 SHEET INDEX	
SHEET NO.	DESCRIPTION
1	COVER SHEET
2	FULL SITE LAYOUT
3	FAN GROUP LAYOUT
4	ABOVE GRADE DUCT
5	BELOW GRADE PIPE
6	SUMP DETAIL

GENERAL

LAYOUT DRAWINGS

COMPOST PROCESS EQUIPMENT
for the
REVERSING AERATION
CASP COMPOSTING SYSTEM

SUBMITTED FOR:

Lenz Enterprises Inc,
Stanwood Compost Facility, Phase II
5210 WA-532
Stanwood, WA 98292

NO	REVISION		
2	ELEVATION DETAILS ADDED	RDM	21 SEP 2018
1	AERATION TRENCH SPACING AND BIOFILTER LAYOUT ADJUSTED	RDM	11 SEP 2018

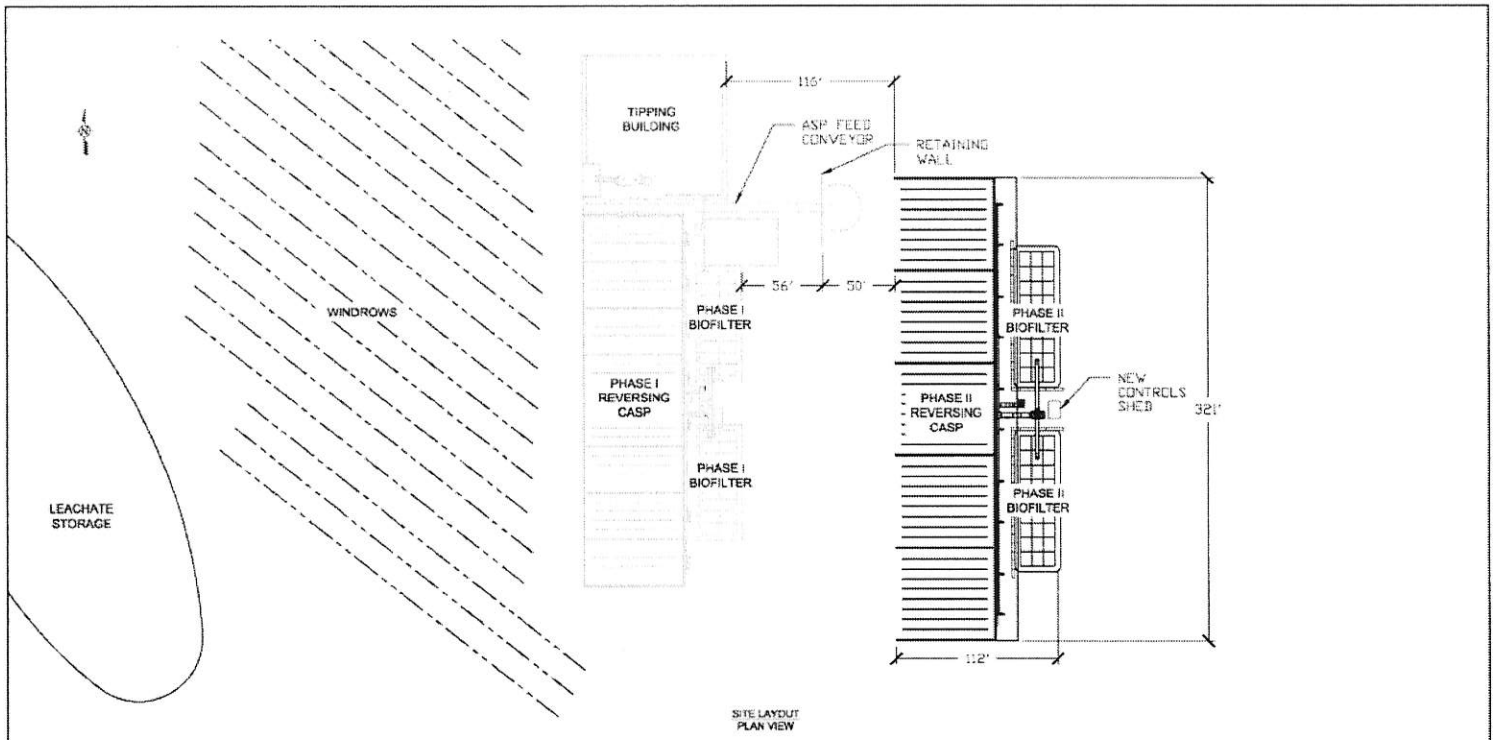
TOLERANCES UNLESS OTHERWISE SPECIFIED
2 PLACE DECIMALS: ±xx
3 PLACE DECIMALS: ±xx
FRACTIONS: ±xx
ANGLES: ±xx

ALL DIMS ARE IN INCHES
DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

ENGINEERED COMPOST SYSTEMS
4011 24th Avenue West Seattle, WA 98199
T 206.284.7021 F 253.414.1529 www.engineeredcs.com

DRAWN:	RDM
CHECKED:	CJH
DATE:	06 SEP 2018
SCALE:	N/A
SIZE	B
TITLE:	AERATION LAYOUT DRAWINGS
PROJECT:	P272-038 LENZ PH II
SHT:	1 OF 6
DWG. NO:	272-038-G01
REV:	2



LENZ ENTERPRISES INC. PHASE II COMPOSTING SYSTEM

NO	REVISION
-	SEE SHT 1 FOR REVISION DETAILS

PROPRIETARY INFORMATION
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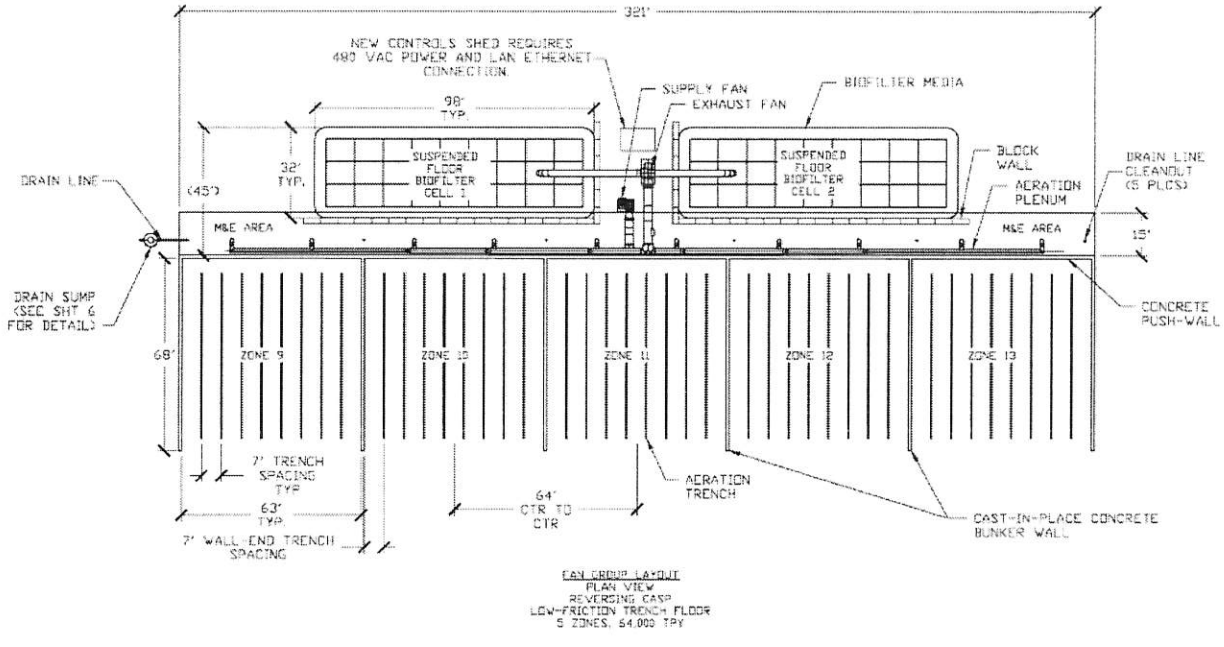
TOLERANCES UNLESS OTHERWISE SPECIFIED
2 PLACE DECIMALS ±xx
3 PLACE DECIMALS ±xx
FRACTIONS ±xx
ANGLES ±xx

ALL DIMS ARE IN INCHES
DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION

ENGINEERED COMPOST SYSTEMS

DRAWN: RDM
CHKD: CJH
DATE: 06 SEP 2018
SCALE: 1/64"=1'
SIZE: B
TITLE: AERATION LAYOUT DRAWINGS
PROJECT: 272-038 LENZ PH II
SHT: 2 OF 6
DWG. NO: 272-038-G01
REV: 2



FAN GROUP LAYOUT
PLAN VIEW
REVERSING CASP
LOW-FRICTION TRENCH FLOOR
5 ZONES, 54,000 TPY

LENZ ENTERPRISES INC. PHASE II COMPOSTING SYSTEM

NO	REVISION
-	SEE SHT 1 FOR REVISION DETAILS

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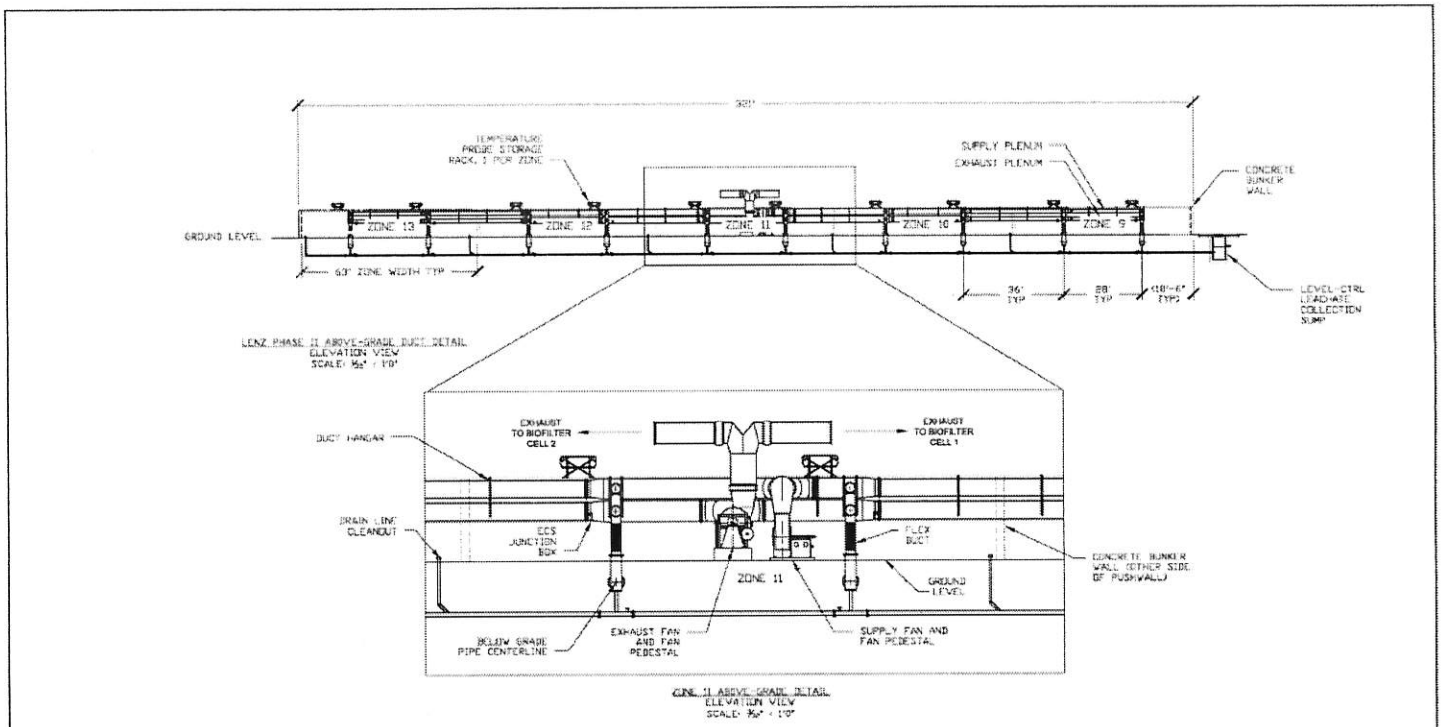
TOLERANCES
UNLESS OTHERWISE SPECIFIED
2 PLACE DECIMALS ±.xx
3 PLACE DECIMALS ±.xxx
FRACTIONS ±xx
ANGLES ±xx

ALL DIMS ARE IN INCHES
DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION

ENGINEERED
COMPOST SYSTEMS

DRAWN: RDM
CHKD: CJH
DATE: 06 SEP 2018
SCALE: 1/32"=1'

SIZE: B
TITLE: AERATION LAYOUT DRAWING
PROJECT: 272-038 LENZ PH II
SHT: 3 OF 6
DWG. NO: 272-038-G01
REV: 2



ABOVE-GRADE DUCT ELEVATION

NOTE:
ALL GEOLOGICAL, CIVIL, AND STRUCTURAL ENGINEERING BY OTHERS.

NO	REVISION
-	SEE SHT 1 FOR REVISION DETAILS

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TOLERANCES UNLESS OTHERWISE SPECIFIED
2 PLACE DECIMALS: ±.xx
3 PLACE DECIMALS: ±.xxx
FRACTIONS: ±xx
ANGLES: ±xx

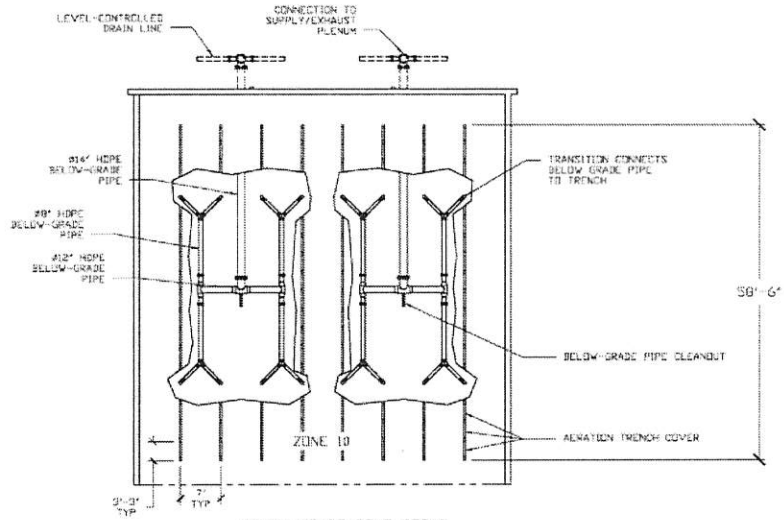
ALL DIMS MM IN INCHES
DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

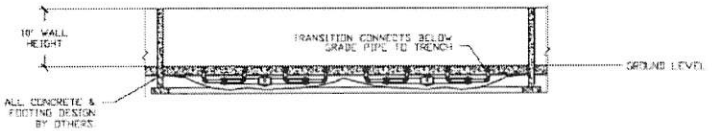
ENGINEERED COMPOST SYSTEMS

DRAWN:	RDM
CHKD:	CJH
DATE:	06 SEP 2018
SCALE:	NOTED
SIZE:	B
TITLE:	AERATION LAYOUT DRAWING
PROJECT:	272-038 LENZ PH II
SHT:	4 OF 6
DWG NO:	272-038-G01
REV:	2

NOTE:
LEACHATE SUMPS PROVIDED BY OTHERS. SUMPS REQUIRE WATER SUPPLY TO MAINTAIN LEVEL CONTROLLED AIR TRAP. SUMP OUT-FALL COLLECTION BY OTHERS.



BELOW GRADE ZONE DETAIL
PLAN VIEW



BELOW GRADE ZONE DETAIL
ELEVATION VIEW

-	SEE SHT 1 FOR REVISION DETAILS	-	-
NO	REVISION		

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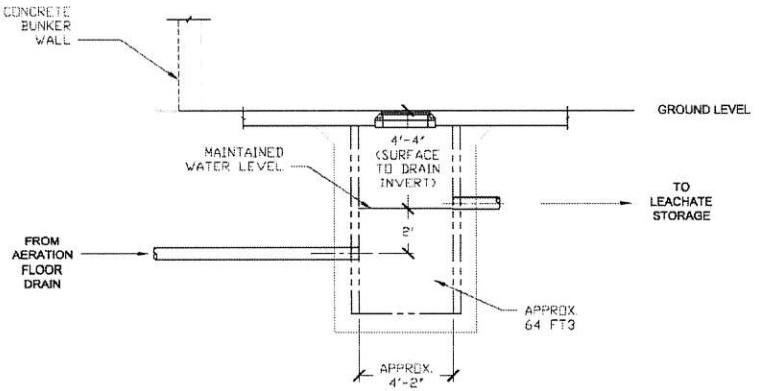
TOLERANCES UNLESS OTHERWISE SPECIFIED
2 PLACE DECIMALS ±xx
3 PLACE DECIMALS ±xx
FRACTIONS ±xx
ANGLES ±xx

ALL DIMS ARE IN INCHES
DO NOT SCALE DRAWING
USING ANGLE PROJECTION

ENGINEERED COMPOST SYSTEMS

DRAWN:	RDM
CHKD:	CJH
DATE:	06 SEP 2018
SCALE:	1/16" = 1'-0"
SIZE	B
TITLE:	AERATION LAYOUT DRAWING
PROJECT:	272-038 LENZ PH II
SHT:	5 OF 6
DWG. NO:	272-038-G01
REV:	2

NOTE:
LEACHATE SUMPS PROVIDED BY OTHERS. SUMPS REQUIRE WATER SUPPLY TO MAINTAIN LEVEL CONTROLLED AIR TRAP. SUMP OUT-FALL COLLECTION BY OTHERS.



LEACHATE SUMP DETAIL
ELEVATION VIEW

-	SEE SHT 1 FOR REVISION DETAILS	-	-
NO	REVISION		

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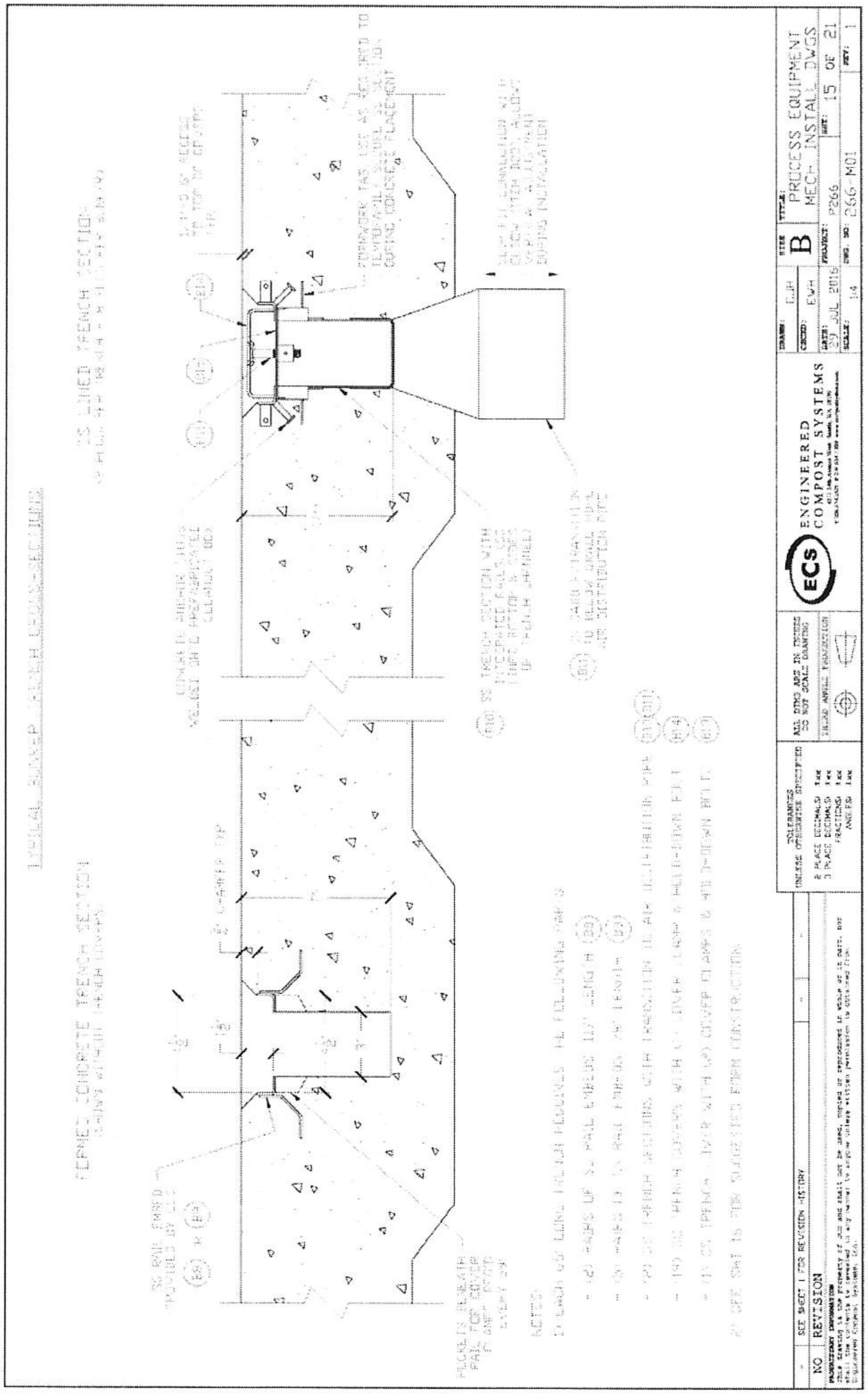
TOLERANCES UNLESS OTHERWISE SPECIFIED
2 PLACE DECIMALS: ±xx
3 PLACE DECIMALS: ±xx
FRACTIONS: ±xx
ANGLES: ±xx

ALL DIMS ARE IN INCHES DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

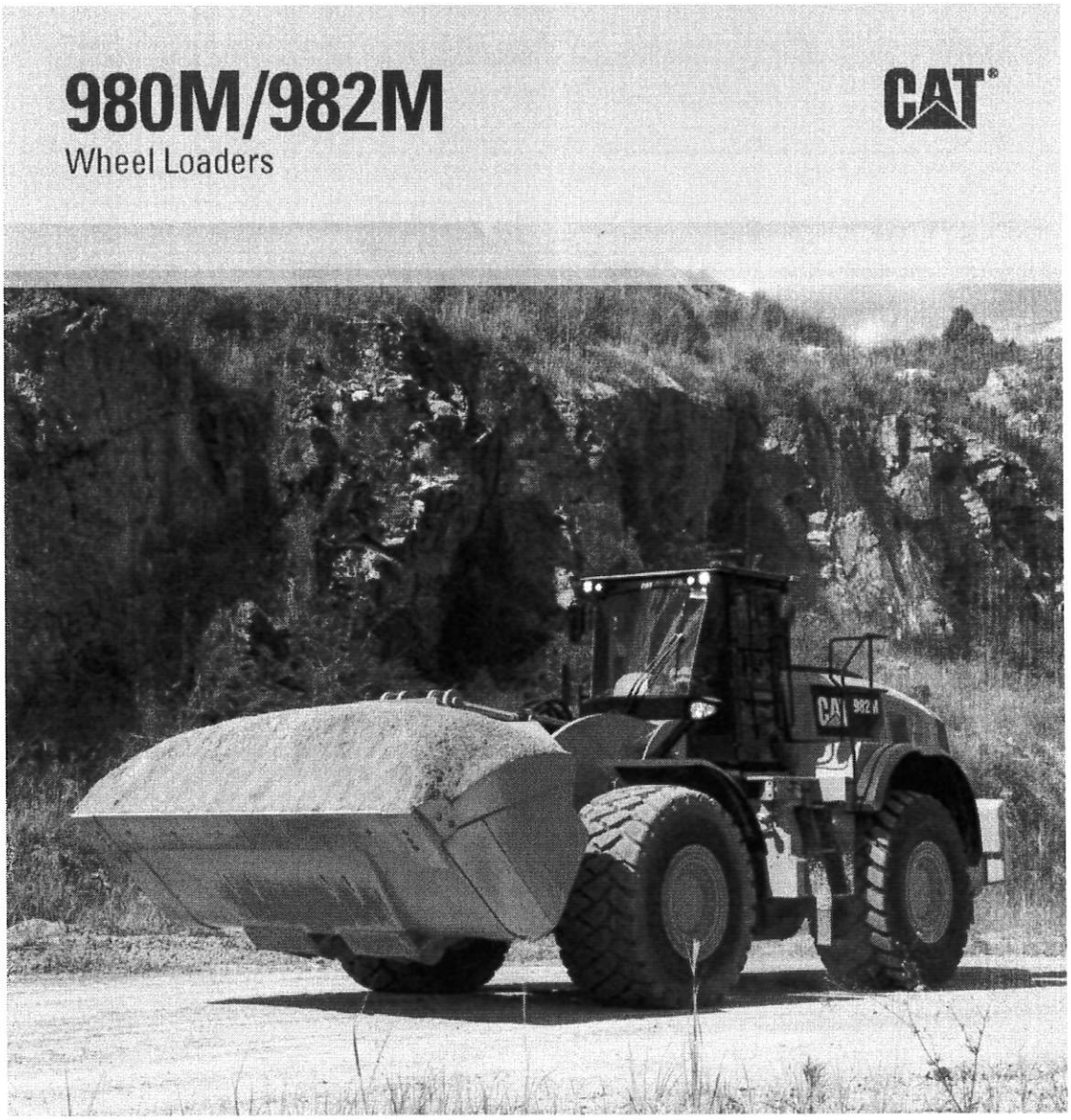
ENGINEERED COMPOST SYSTEMS

DRAWN: RDM
CHKD: CJH
DATE: 06 SEP 2018
SCALE: 1/4" = 1'-0"
SIZE: B
TITLE: 1/4" = 1'-0" DRAWING
PROJECT: 272-038 LENZ PH II
SHT: 6 OF 6
DWG. NO: 272-038-G01
REV: 2


PROCESS EQUIPMENT
MECH-INSTALL DWGS
ENGINEERED
COMPOST SYSTEMS
P266
15 OF 21
REVISION

Appendix D: Structural Calculations and Design

Appendix E: Major Equipment



	980M	982M
Engine Model	Cat® C13 ACERT™	Cat C13 ACERT
Maximum Gross Power – SAE J1995	317 kW (425 hp)	325 kW (436 hp)
Maximum Net Power – SAE J1349	288 kW (386 hp)	297 kW (398 hp)
Bucket Capacities	4.2-12.2 m^3 (5.25-16.0 yd^3)	4.6-12.0 m^3 (6.0-15.75 yd^3)
Operating Weight	30 090 kg (66,337 lb)*	35 563 kg (78,402 lb)**

*For 5.4 m^3 (7.1 yd^3) general purpose buckets with BOCE.
**For 6.1 m^3 (8.0 yd^3) general purpose buckets with BOCE.

980M/982M Wheel Loaders Specifications

Engine – 980M

Engine Model	Cat C13 ACERT	
Maximum Gross Power (1,700 rpm)		
SAE J1995	317 kW	425 hp
Maximum Net Power (1,700 rpm)		
SAE J1349	288 kW	386 hp
Peak Gross Torque (1,200 rpm)		
SAE J1995	2206 N·m	1,627 lbf-ft
Maximum Net Torque (1,100 rpm)		
SAE J1349	2054 N·m	1,515 lbf-ft
Bore	130 mm	5.12 in
Stroke	157 mm	6.18 in
Displacement	12.5 L	763 in³

- Cat engine with ACERT Technology – meets Tier 4 Final emission standards.
- The power ratings apply at the stated speed when tested under the reference conditions for the specified standards.
- The net power advertised is the power available at the flywheel when the engine is equipped with fan, alternator, air cleaner and aftertreatment.
- The gross power advertised is with the fan at maximum speed.

Buckets – 980M

Bucket Capacities	4.2-12.2 m³	5.25-16.0 yd³

Weight – 980M

Operating Weight	30 090 kg	66,337 lb

- Weight based on a machine configuration with Michelin 29.5R25 XLDD1 L4 radial tires, full fluids, operator, standard counterweight, cold start, roading fenders, Product Link, open differential axles (front/rear), secondary steering, sound suppression, and a 5.4 m³ (7.1 yd³) general purpose bucket with BOCE.

Operating Specifications – 980M

Static Tipping Load – Full 40° Turn		
With Tire Deflection	19 565 kg	43,133 lb
No Tire Deflection	20 796 kg	45,847 lb
Breakout Force	224 kN	50,357 lbf

- Full compliance to ISO (2007) 143971 Sections 1 thru 6, which requires 2% verification between calculations and testing.

Engine – 982M

Engine Model	Cat C13 ACERT	
Maximum Gross Power (1,700 rpm)		
SAE J1995	325 kW	436 hp
Maximum Net Power (1,700 rpm)		
SAE J1349	297 kW	398 hp
Peak Gross Torque (1,200 rpm)		
SAE J1995	2206 N·m	1,627 lbf-ft
Maximum Net Torque (1,100 rpm)		
SAE J1349	2058 N·m	1,518 lbf-ft
Bore	130 mm	5.12 in
Stroke	157 mm	6.18 in
Displacement	12.5 L	763 in³

- Cat engine with ACERT Technology – meets Tier 4 Final emission standards.
- The power ratings apply at the stated speed when tested under the reference conditions for the specified standards.
- The net power advertised is the power available at the flywheel when the engine is equipped with fan, alternator, air cleaner and aftertreatment.
- The gross power advertised is with the fan at maximum speed.

Buckets – 982M

Bucket Capacities	4.6-12.0 m³	6.0-15.75 yd³

Weight – 982M

Operating Weight	35 563 kg	78,402 lb

- Weight based on a machine configuration with Bridgestone 875/65R29 VLTS L4 radial tires, full fluids, operator, standard counterweight, cold start, roading fenders, Product Link, open differential axles (front/rear), secondary steering, sound suppression, and a 6.1 m³ (8.0 yd³) general purpose bucket with BOCE.

Operating Specifications – 982M

Static Tipping Load – Full 40° Turn		
With Tire Deflection	21 080 kg	46,473 lb
No Tire Deflection	22 393 kg	49,368 lb
Breakout Force	260 kN	58,450 lbf

- Full compliance to ISO (2007) 143971 Sections 1 thru 6, which requires 2% verification between calculations and testing.

980M/982M Wheel Loaders Specifications

Service Refill Capacities – 980M

Fuel Tank	441 L	116 gal
DEF Tank	21 L	5.5 gal
Cooling System	53 L	14.0 gal
Crankcase	37 L	9.8 gal
Transmission	90 L	23.8 gal
Differentials and Final Drives – Front	84 L	22 gal
Differentials and Final Drives – Rear	84 L	22 gal
Hydraulic Tank	153 L	40 gal

Cab

ROPS/FOPS	ROPS/FOPS meet ISO 3471:2008 and ISO 3449:2005 Level II standards

Sound

The sound values indicated below are for specific operating conditions only. Machine and operator sound levels will vary at different engine and/or cooling fan speeds. Hearing protection may be needed when the machine is operated with a cabin that is not properly maintained, or when the doors and/or windows are open for extended periods or in a noisy environment.

Operator Sound Pressure Level (ISO 6396:2008)	72 dB(A)
Exterior Sound Power Level (ISO 6395:2008)	112 dB(A)*
Exterior Sound Pressure Level (SAE J88:2013)	78 dB(A)**

*For a standard machine configuration, measured according to the procedures specified with the cooling fan speed set at maximum value.

**For a standard machine configuration, measured according to the procedures specified. The measurement was conducted under the following conditions: distance of 15 m (49.2 ft), moving forward in second gear ratio with the cooling fan speed set at maximum value.

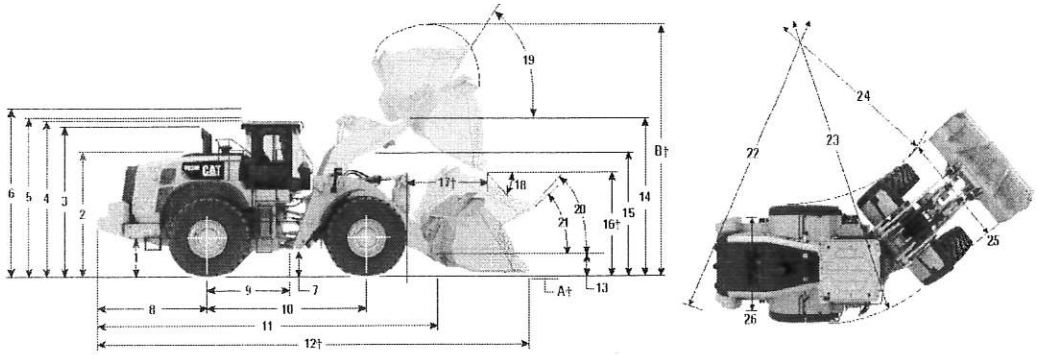
Service Refill Capacities – 982M

Fuel Tank	441 L	116 gal
DEF Tank	21 L	5.5 gal
Cooling System	53 L	14.0 gal
Crankcase	37 L	9.8 gal
Transmission	90 L	23.8 gal
Differentials and Final Drives – Front	92 L	24.3 gal
Differentials and Final Drives – Rear	92 L	24.3 gal
Hydraulic Tank	153 L	40 gal

980M/982M Wheel Loaders Specifications

982M Dimensions

All dimensions are approximate.



		Standard Lift	
1	Height to Axle Centerline	874 mm	2'10"
2	Height to Top of Hood	3083 mm	10'2"
3	Height to Top of Exhaust Pipe	3719 mm	12'3"
4	Height to Top of ROPS	3786 mm	12'6"
5	Height to Top of Product Link Antenna	3864 mm	12'9"
6	Height to Top of Warning Beacon	4085 mm	13'5"
7	Ground Clearance	426 mm	1'4"
8	Center Line of Rear Axle to Edge of Counterweight	2716 mm	8'11"
9	Center Line of Rear Axle to Hitch	1900 mm	6'3"
10	Wheelbase	3800 mm	12'6"
11	Overall Length (without bucket)	8584 mm	28'2"
12	Shipping Length (with bucket level on ground)*†	10 177 mm	33'5"
13	Hinge Pin Height at Carry Height	790 mm	2'8"
14	Hinge Pin Height at Maximum Lift	4743 mm	15'6"
15	Lift Arm Clearance at Maximum Lift	3884 mm	12'8"
16	Dump Clearance at Maximum Lift and 45° Discharge*†	3365 mm	11'1"
17	Reach at Maximum Lift and 45° Discharge*†	1569 mm	5'2"
18	Dump Angle at Maximum Lift and Dump (on stops)*	50 degrees	
19	Rack Back at Maximum Lift*	57 degrees	
20	Rack Back at Carry Height*	48 degrees	
21	Rack Back at Ground*	42 degrees	
22	Clearance Circle (dia) to Counterweight	13 950 mm	45'10"
23	Clearance Circle (dia) to Outside of Tires	15 026 mm	49'4"
24	Clearance Circle (dia) to Inside of Tires	8148 mm	26'9"
25	Width Over Tires – Maximum (unloaded)	3452 mm	11'4"
	Width Over Tires – Maximum (loaded)	3499 mm	11'6"
26	Tread Width	2540 mm	8'4"

*With 6.1 m³ (8.0 yd³) general purpose pin on bucket with BOCE (see Operating Specifications for other buckets).

†Dimensions are listed in Operating Specifications charts.

All height and tire related dimensions are with Bridgestone 875/65R29 VLTS L4 radial tires (see Tire Option Chart for other tires).
"Width Over Tires" dimensions are over the bulge and include growth.

KOMPTECH
TECHNOLOGY FOR A BETTER ENVIRONMENT

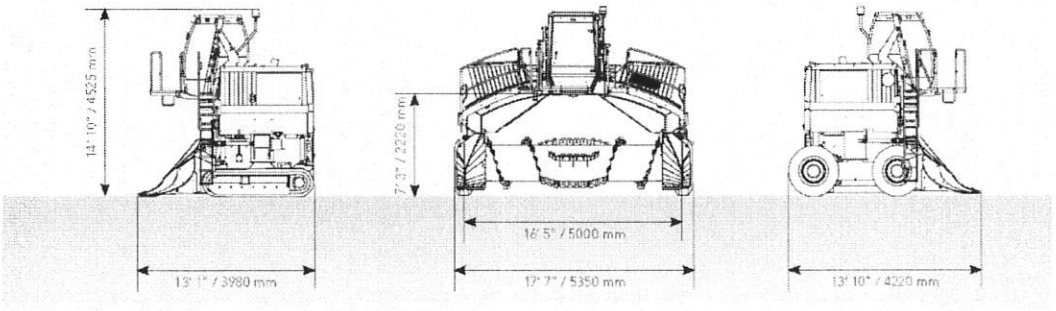
TOPTURN X

WINDROW TURNER
PERFECT MIXING
WHEEL OR TRACK
ON TOP OF THE SITUATION

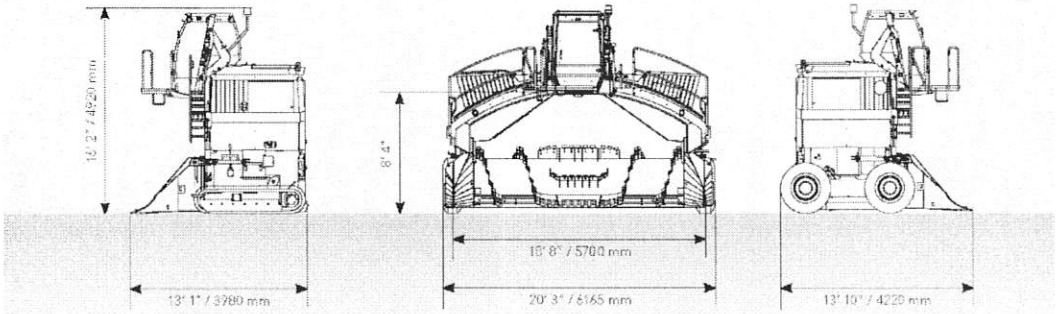
TECHNICAL SPECIFICATIONS

	X53	X60	X67
Drive			
Diesel engine:	CAT ® C9	CAT ® C9	CAT ® C13
Power:	242 kW / 330 HP	242 kW / 330 HP	328 kW / 446 HP
Turning device			
Drum diameter:	47" / 1200 mm	4' 7" / 1400 mm	5' 9" / 1750 mm
Drum rpm:	0-195	0-195	0-160
Windrow dimensions			
Max. intake width:	16' 5" / 5000 mm	18' 8" / 5700 mm	21' 0" / 6400 mm
Max. windrow height:	7' 10" / 2400 mm	9' 2" / 2800 mm	10' 2" / 3100 mm
Max. windrow cross-section:	~ 70 ft² / ~ 6.5 m²	~ 92 ft² / ~ 8.5 m²	~ 113 ft² / ~ 10.5 m²
Travelling speeds (I standard, II optional)			
Wheel:	I: 0-2.5 mph / 0-4 km/h II: 0-4.4 mph /0-7 km/h	I: 0-2.5 mph / 0-4 km/h II: 0-3.7 mph / 0-6 km/h	I: 0-1.9 mph / 0-3 km/h II: 0-4.4 mph / 0-7 km/h
Track:	I: 0-2.5 mph / 0-4 km/h	I: 0-2.5 mph / 0-4 km/h	I: 0-2.5 mph / 0-4 km/h II: 0-3.7 mph / 0-6 km/h
Dimensions L x W x H			
Transport dimensions Wheel:	17' 7" x 9' 10" x 9' 10" 5350 x 3000 x 3000 mm	20' 3" x 9' 10" x 11' 4" 6165 x 3000 x 3450 mm	22' 2" x 9' 10" x 11' 8" 6750 x 3000 x 3560 mm
Transport dimensions Track:	17' 7" x 8' 4" x 9' 10" 5350 x 2550 x 3000 mm	20' 3" x 8' 4" x 11' 4" 6165 x 2550 x 3450 mm	22' 2" x 9' 10" x 11' 8" 6750 x 3000 x 3560 mm
Working dimensions Wheel:	13' 10" x 17' 7" 14' 10" 4220 x 5350 x 4525 mm	13' 10" x 20' 3" x 16' 2" 4220 x 6165 x 4920 mm	16' 4" x 22' 2" x 17' 7" 4970 x 6750 x 5350 mm
Working dimensions Track:	13' 1" x 17' 7" x 14' 10" 3980 x 5350 x 4525 mm	13' 1" x 20' 3" x 16' 2" 3980 x 6165 x 4920 mm	15' 6" x 22' 2" x 17' 7" 4720 x 6750 x 5350 mm
Weight			
Wheel:	~ 15.0 t.sh / 13.5 t	~ 16.5 t.sh / 15.0 t	~ 23.0 t.sh / 21.0 t
Track:	~ 15.5 t.sh / 14.0 t	~ 17.0 t.sh / 15.5 t	~ 23.5 t.sh / 21.3 t
Throughput (dependent on material)			
Throughput performance:	up to 4600 yd³/h / up to 3500 m³/h	up to 4600 yd³/h / up to 3500 m³/h	up to 5900 yd³/h / up to 4500 m³/h
Options			
Mixing drum (X53), two speed level, lateral displacement device, central lubrication, scraper, protective ventilation, service steps, access platform, watering etc.			

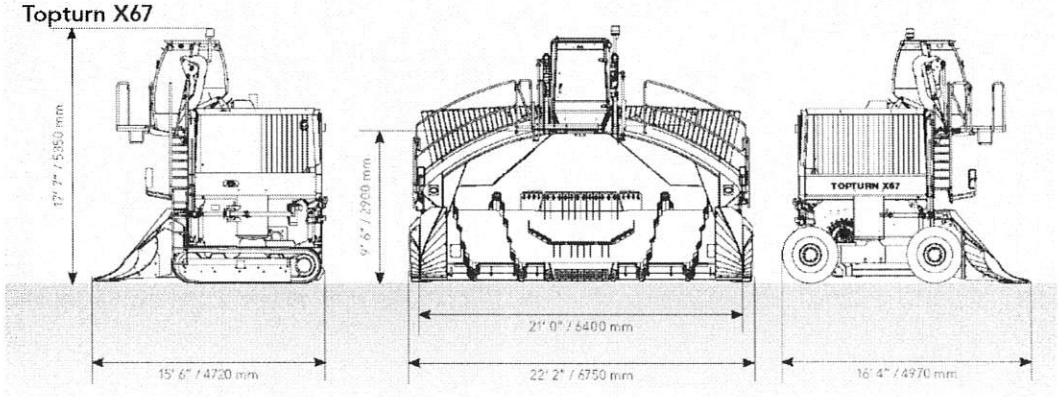
Topturn X53



Topturn X60



Topturn X67



Lenz Enterprises, Inc. Compost Facility

Snohomish County, Washington

PSCAA Application; Permit Modification

February 2019

Prepared by: Lenz Enterprises, Inc.

PO Box 848

Stanwood, WA 98292

TABLE OF CONTENTS

I. Introduction

This application is being submitted to the Puget Sound Clean Air Agency to modify an existing Notice of Construction (No. 10494) for Lenz Enterprises located in Snohomish County. This application includes proposed new infrastructure and production rates.

Lenz Enterprises Inc. (Lenz) owns and operates a commercial composting facility currently processing 75,000 tons of organic residuals each year. The facility began operation in 2008 composting organic residuals generated by residential, commercial, and municipal sources. Composting at the Lenz facility includes a three-stage system:

- Phase 1 High-Rate Phase: Aerated Static Pile (ASP) composting with controlled forced airflow plenum (negative airflow - top down; positive airflow - bottom up; or no airflow) with temperature monitoring;
- Phase 2 Stabilization Phase: Windrow or turned Mass Bed composting with manual temperature and gas production monitoring; and may include:
- Phase 3 Curing Phase: turned or unturned Mass-Bed curing. This material may be screened or unscreened. Curing occurs for some materials based on the ultimate use of the final product.

This suite of treatment results in high-quality compost used in agriculture, landscaping, DOT road projects, residential gardens and other uses. This permit modification includes the following:

- Modifications to feedstock handling operations in the tipping building to accommodate a 100% increase in feedstock handling capacity;
- Installation of a 100% greater capacity (5,000 CFM) air processing system in the tipping building to ensure adequate air capture and treatment of tipping building air;
- Construction and operation of an additional 22,000 square feet of high-rate Aerated Static Pile (ASP) composting area with controlled forced airflow plenum (negative and positive airflow) with temperature monitoring;
- Construction and operation of an additional 5,488 square feet of biofilter to accommodate additional ASP operations; and
- Expanded Phase II composting area to include three additional acres of impervious surface and incorporation of windrow composting with manual temperature and gas monitoring.

These modifications will allow feedstock handling up to 150,000 tons per year with an adequate factor of safety built into the design.

Every aspect of the proposed new design has been prepared so that the facility can be operated to meet the performance standards of WAC 173-350-040; site specific solid waste permit requirements, and site NOC (air permit) requirements. Specifically the facility will:

- be designed, constructed, operated, closed and provide post-closure care as applicable, in a manner that does not pose a threat to human health or the environment;
- not be in conflict with the approved local comprehensive solid waste management plan prepared in accordance with chapter 70.95 RCW, Solid waste management—Reduction and recycling, and/or the local hazardous waste management plan prepared in accordance with chapter 70.105 RCW, Hazardous waste management; and
- comply with all other applicable local, state, and federal laws and regulations.

Included in this permit modification and supporting documentation are:

- Drawings of the facility including the location and size of feedstock and composted material storage areas, compost processing areas, fixed equipment, buildings, stormwater management features where applicable, access roads, traffic patterns, and other constructed areas and buildings integral to facility operation;
- Design specifications for the engineered features of the facility including, but not limited to, pads, stormwater management features, leachate management features, and aeration and emission management features as required by a permitting air authority where applicable; and
- A construction quality assurance plan that describes monitoring, testing, and documentation procedures that will be performed during construction of the facility to ensure the facility is constructed in accordance with the approved design.

Compliance with rules, regulations and performance standards are discussed herein.

An updated Plan of operation and Progressive odor management plan are attached as appendices to supplement this information. An Engineering Report, required by WAC 173-350-220, is also attached for reference and supplemental information where applicable.

II. Project Description

This proposal includes six phases of operation to be assessed, upgraded or modified to allow for increased operations at the site. These include:

1. Feedstock receiving and pretreatment: organics receiving in the tipping building, initial quality evaluation, initial contaminant removal, mixing, and grinding.
2. ASP composting: initial breakdown of organics through intense management and high rates of aeration. The two primary objectives of this stage are to meet regulatory time and temperature requirements (55 degrees Celsius or higher for three consecutive days) and to reduce the BVS to a level characteristic of Phase 2 composting operations.
3. Windrow composting: characterized by lower temperatures, reduced oxygen uptake rates, and a greater stability or the composting organics.
4. Compost Curing: characterized by yet lower temperatures and reduced oxygen requirements.
5. Stormwater control, treatment and reuse.
6. Management and control of feedstocks, processes and personnel.

III. Proposed Upgrades

A. Feedstock receiving and pretreatment

The current system for feedstock receiving and pretreatment includes an average of six hours per day of continual processing by one shift five days a week. The first proposed change to feedstock receiving and pretreatment will be to establish two, overlapping shifts, of compost personnel to facilitate longer processing on site which will occur from 7:00am to 5:30pm Monday through Saturday. This will increase the processing potential per day, and add an additional day of processing, resulting in an annual throughput capability of 157,500 tons.

The second proposed change is to the receiving evaluation process to allow for more accurate separation of brush and stumps; and other non-contaminated materials. These materials do not need to be treated through the initial screening process, nor do they need to be hand-picked for contaminates on the picking station. Diverting materials directly to grinding (bypassing initial screening and hand-picking) results in higher throughput of organics at this stage of operations. This process has already been extensively tested on site and results in an overall increase of 35% production. The resultant processing potential with this opportunity and the increased hours results in a processing capability of 183,750 tons annually.

An upgraded maintenance program including a dedicated maintenance staff that will maintain and repair equipment during operational downtime and an enhanced parts inventory for quick repairs of equipment when required will also be added to the operations.

B. Phase 1 composting

Phase 1 composting is currently achieved using a Covered Aerated Static Pile (CASP) process that was designed by Engineered Compost Systems of Seattle. This process includes a computer controlled process, negative and positive aeration, continual temperature monitoring, and individually controlled processing bays. The current CASP encompasses 17,000 square feet of processing area. An additional 22,000 square feet of processing area is proposed for this upgrade. The proposed new CASP would use the same processing technology as the existing system and the same environmental controls (dedicated biofilters for negative air processing and biofilter caps for positive air processing). This is a 129% increase in floor space increasing functional processing capacity on the air floor to 172,059 tons annually. Because this is more processing capacity than required for the upgrade to 150,000 tons annually of incoming feedstock, retention times in the ASP can be longer resulting in more controlled composting for a longer period of time resulting in lower odor and VOC potential.

Phase I - ASP Modification		
75,000	tons	Current annual capacity
17,000	ft^2	Current ASP floor
22,000	ft^2	New ASP floor

129	%	increase in floor area capacity
97,059	tons	processing capacity of new ASP
172,059	tons	Total processing capacity (new and existing ASP)

Lenz has found, through actual operations, that the particle size of initial feedstock preparation can be reduced if ambient air flow to the CASP is increased. This reduction in particle size increases the functional capacity of the CASP by approximately 25 percent by reducing interstitial space in the feedstock mix. The additional capacity can also be used, when necessary, to increase residence time in the CASP which in turn increases the stability of the compost prior to Phase II composting. A higher Cubic Feet per Minute (CFM) to the CASP is proposed in this design to facilitate the processing of a smaller composting particle size.

C. Phase 2 composting

Phase 2 composting is currently achieved on site using a Mass-bed system of composting. This system is identical to windrow composting only the windrows are pushed together to eliminate valleys between the rows. This process allows for a reduced processing area. This current process includes approximately 72,000 square feet of area that can process a static compost pile of 21,333 cubic yards.

Proposed upgrades to this phase of processing include using an additional paved area of 177,000 square feet for processing. This process would also change from the Mass-bed system of composting to windrow composting as the primary composting mass configuration. While windrow composting uses more surface area, available equipment allows for fasters bed turns and windrow pile configuration allows for more exposure of the pile to natural (non-mechanical) aeration that occurs in-between turnings. These two factors create a more consistent aeration of the pile and shorter residence times to achieve the same final compost stability and maturity and reduced odor potential.

Phase II - Windrow Composting		
21,333	cy	Mass-Bed Volume (current)
72,000	ft^2	Mass-Bed Area (current)
8	ft	Pile height (current)
1.65	acres	Mass-Bed Area (current)
177,000	ft^2	Proposed Phase II
4.0	acres	Proposed Phase II
7,848	cy	Proposed Phase II per acre of windrow
5.72	acres	Phase I & II
44,861	cy	Windrow Volume Phase I & II
2.10	x	Increase in Volume Capacity

D. Phase 3 composting

Enhancements to Phase I and II composting will reduce the amount of time required for Phase III composting which results in decreased pile residence times and on-site VOC and odor potentials from this phase of the process.

E. Stormwater control, treatment and reuse

An additional 177,000 square feet of Phase 2 processing area will result in additional stormwater capture. However, because of the evaporative energy of the composting process, an excess of evaporative capacity will still exist on site (as it does now) and therefore no additional winter leachate capacity will be required. The 24 hour-25 year storm event will increase from a gross potential of 268,000 gallon to a gross potential of 623,000 gallons. Assuming an average absorptive and interstitial space capacity of five percent of the 67,000 cubic yards of compost in the secondary process (the location of the potential stormwater increase) the capacity for holding this additional water is 673,000 gallons. This change will result in no net gain to storm event runoff form the additional impervious surface.

F. Management and control of feedstocks, processes and personnel

An additional split-shift will be added to the composting process to fully utilize the operational day of 10.5 hours and Saturday operation. This will also allow a period of time every day where extra personnel are available to conduct some labor intensive duties.

A separate maintenance crew will be established to ensure that all equipment and processes are properly maintained and ready for use as soon as compost operations personnel arrive at work.

Management of incoming loads of organics will be managed to reduce or eliminate smaller "packer-trucks" delivering only a few tons of material and replace them with larger heavy duty trucks capable of delivering up to 30 tons. This will reduce truck traffic to the site and create a more homogenous, manageable, and predictable delivery schedule that will streamline operations.

IV. PSCAA Permit Modification – Required Information (Form No. 50-170)

A. General Description of Operation and its Purpose

Specify the type of operation (aerobic or anaerobic) and its intended use (produce wholesale or retail compost). Identify which of the following categories the project fits into.

The previous introduction, project description and attached supporting documentation describe the operation and its purpose. This project is a "Modification" in that it proposes a physical change in the form of additional infrastructure, and a change to production rate (although not type) resulting in an increased amount of emissions. Lenz Enterprises produces compost for both the wholesale and retail markets.

Estimated hours of operation are from 7:00am to 5:30pm Monday through Saturday.

The estimated installation date is summer 2019. Construction will begin as soon as permitting has been approved. Estimated construction duration is two to three months. Increased production rate will occur gradually as new contracts for feedstocks are obtained.

The minimum distance from the proposed processing operation to nearest property line is 400 ft. It should be noted that Lenz Enterprises owns adjacent property which is used as an additional buffer between processing activities and the neatest neighboring property.

B. Raw Material Properties

Types of materials Composted: The majority (75%) of raw materials to be composted will be curb-side recycled yard and food residuals. Other materials to be composted will include land-clearing debris (20%) and agricultural debris (5%). Curb-side recycled yard and food waste originates primarily from the City of Seattle and other cities in King, Snohomish, Island, Skagit and Whatcom Counties. Land-clearing debris originates primarily from Snohomish and Island Counties. Agricultural debris primarily consists of animal bedding and paunch manure that is sourced in Stanwood and various other crop residuals.

Estimated amount of each material processed: Curb-side recycled yard and food residuals will account for approximately 112,000 tons of material annually. Land clearing debris will account for approximately 30,000 tons annually. Agricultural debris will account for approximately 8,000 tons annually.

Daily tonnage will vary depending on contracts obtained and curb-side recycling schedules. Estimates for daily tonnage are an average of 430 tons per day ranging from a minimum of 150 tons per day to a peak average of 800 tons per day. The percentage of each type of feedstock delivered daily will be similar to percentages given above for annual feedstocks.

Time between waste generation and waste processing: Recycled organics are processed on-demand at the Lenz Compost Facility. A site goal is to process all delivered materials the same day they are delivered. During times of atypical delivery schedules (such as transportation delays and off-site process slow-downs) there may be times when a portion of material delivered is not processed the same day. When this occurs the material is consolidated at the back of the tipping building, nearest to the tipping building air handling unit, so that any odor that may be generated is captured and treated through the site biofilters. Material that is stored overnight is covered with a minimum 12-inch biofilter layer. Except for periods during primary equipment malfunction, all materials are processed within 24 hours of arrival at the site.

C. Design

Equipment used: Horizontal grinders are used to size incoming feedstocks to proper size for optimum composting. Screeners and hand-picking is used to clean contaminated incoming feedstocks. Front end loaders and conveyers are used to move materials around the site at various stages of the process. Composting technologies include Aerated Static Pile (ASP) composting; Windrow composting, and final compost curing. Compost loaded and removed from ASP composting using a front-end loader. Compost is turned in place during windrow composting using a specialized compost turner. Final compost is screened and remaining contaminants removed using Star Screens, Trommel Screens, and specialty density separation equipment including air-lift separators and ballistic separation techniques.

Carbon-to-Nitrogen Ratio, Oxygen and Moisture Contents, Porosity, Temperature and pH: Phase I composting occurs in a reversing Aerated Static Pile system with continuous temperature monitoring and excessive air handling capabilities. Ambient air leaving the ASP air is treated with biofilters. A static biofilter is used to treat air that flows down through the pile (negative air flow) and a constructed biofilter (each ASP pile is topped with a biofilter) is used to treat air that flows up through the pile (positive air flow).

More specific information is provided in Introduction, Project Description and Proposed Upgrade sections of this document and supporting documentation. A process schematic is included in Appendix A.

Operating parameters are based on accurately preparing a good compost feedstock mix and the following conditions:

- Carbon to Nitrogen Ratio (Target range 20:1 – 40:1)

- Oxygen ranges are a complex set of variables dependent upon the kinetics of oxygen transport, the rate of aerobic metabolism, temperature of the compost process, diffusion of oxygen through the liquid phase, feedstock size distribution and other factors. In actual operation supplying adequate ambient air for cooling has been shown to also supply an excess of oxygen to the process. The proposed ECS system includes a "peak" aeration rate of 5.5 cfm/cy and an "average" aeration rate of 3.5 cfm/cy. For a more detailed discussion of aeration please refer to the attached Basis of Design for the aeration system.
- Moisture Content of Mix (Target range 40-65 Percent)
- Minimum porosity (also called interstitial space or free air space (FAS)) is a theoretical condition that can only be approximated in actual operations and can be varied widely with good composting results depending upon the amount of ambient air supplied to the pile and moisture content. Common thought on FAS is that a minimum of 30 percent is recommended. Because of the excess ambient air supply available in the Lenz composting system this minimum FAS can be reduced. However 30 percent FAS is still used as a target at the site.
- The pH range that is most effective for optimum composting is 6.5 – 8.0. This target range is used at the Lenz Composting Facility.
- Temperature in the ASP is controlled to ensure that regulatory time and temperature is a priority during ASP composting. ASP temperatures are controlled to ensure that the pile reaches a minimum temperature of 55C for 72 hours. After this regulatory requirement is met the pile is allowed to range from approximately 45C – 70C depending upon the type of feedstocks that are being processed. As the Volatile Biological Solids of the pile are reduced a natural progression from thermophilic bacteria (thriving at 41C – 122C) to mesophilic bacteria (thriving at 20C - 45C) occurs. This change in temperature occurs over a period of months as the energy level of the pile decreases.

D. Operation and Maintenance

Methods to regulate the LCF composting process and in turn control odors, falls into three general categories. These categories include: 1) biological optimization of the compost pile environment to enhance microbial activity; 2) enhancing emission control infrastructure and techniques to mitigate potential odors; and 3) amending high-energy compost feedstocks with high-carbon additives.

1) Biological optimization of the composting process

Lenz employs several methods and strategies to optimize proper biology in the composting process. This begins with proper identification of feedstock character, and proper ratios of different feedstocks and feedstock constituents. Prior to any feedstock acceptance at Lenz, the material constituency is evaluated. This typically includes identification of constituents and sources (e.g. yard trimming from residential sources, pre-consumer food debris from commercial sources, etc). If the feedstock is deemed acceptable, the constituency and volume is evaluated in the context of all feedstocks delivered to the LCF. If the material is compatible with the entire supply of feedstocks delivered to the site (e.g.

maintains proper C:N ratios, moisture contents, etc.) then it can be accepted. The next step in biological optimization is to properly treat each individual load of feedstock that is delivered to the site. This occurs on a day-by-day basis by our highly trained and educated staff. Biological optimization cannot occur without trained and dedicated staff who can evaluate feedstocks on a case-by-case basis. Staff treat each feedstocks as needed to obtain optimized C:N ratios, moisture, and size proportioning. After feedstocks are properly treated, they are delivered to the ASP where they are continuously monitored for temperature at four locations within the pile. Temperature is one of the key field indicators to determine if a compost pile has an optimum environment for the correct biology. In addition to temperature, trained compost operators check the status of each pile multiple times a day to ensure composting is occurring homogenously throughout the pile (no excessive temperature variations, or variable moisture pockets). These checks may include oxygen, moisture, air flow, pH, or various other parameters to ensure proper operation. Operational checks continue after the material is transferred from Phase I composting (ASP) to Phase II Windrow composting. Process optimization in Phase II is controlled by mechanical turning and watering of the material as need to maintain proper oxygen and moisture levels.

2) Enhancing emission control infrastructure and techniques to mitigate potential odors

Emission controls and techniques begin in the tipping building where on-demand processing takes place. Organic feedstocks can be a significant source of odor if not handled promptly and correctly. The main goal in the tipping building is to process incoming feedstocks as soon as possible after they arrive. This may include character evaluation of the feedstock, sorting, screening, handpicking of contaminants, grinding, and mixing with high carbon source materials. Emission control infrastructure in the building includes a high volume collection and exhaust fan (5,000 CFM) to capture potential odors and direct them through an engineered biofilter.

Emission control in the ASP composting system includes maintaining optimum active compost conditions, maintaining proper conditions in the static biofilters, and proper sourcing and placement of incorporated biofilter medium to cap active ASP composting. Compost maturity is determined using a Solvita test.

Emission control in the Windrow composting system includes monitoring the composting mass to ensure that optimum conditions are maintained. This includes monitoring and optimizing oxygen levels, moisture levels, and regularly homogenizing the pile. Windrows are turned a minimum of every seven days. Compost maturity is determined using a Solvita test.

Emission control in the leachate collection, treatment and storage system includes ensuring proper conditions in the Modified Sequential Batch Reactor (oxygen, pH, food-to-microorganism ratios, etc.), ensuring the collection and conveyance system does not have stagnant conditions, and ensuring the leachate storage pond maintains optimum conditions to mitigate odors.

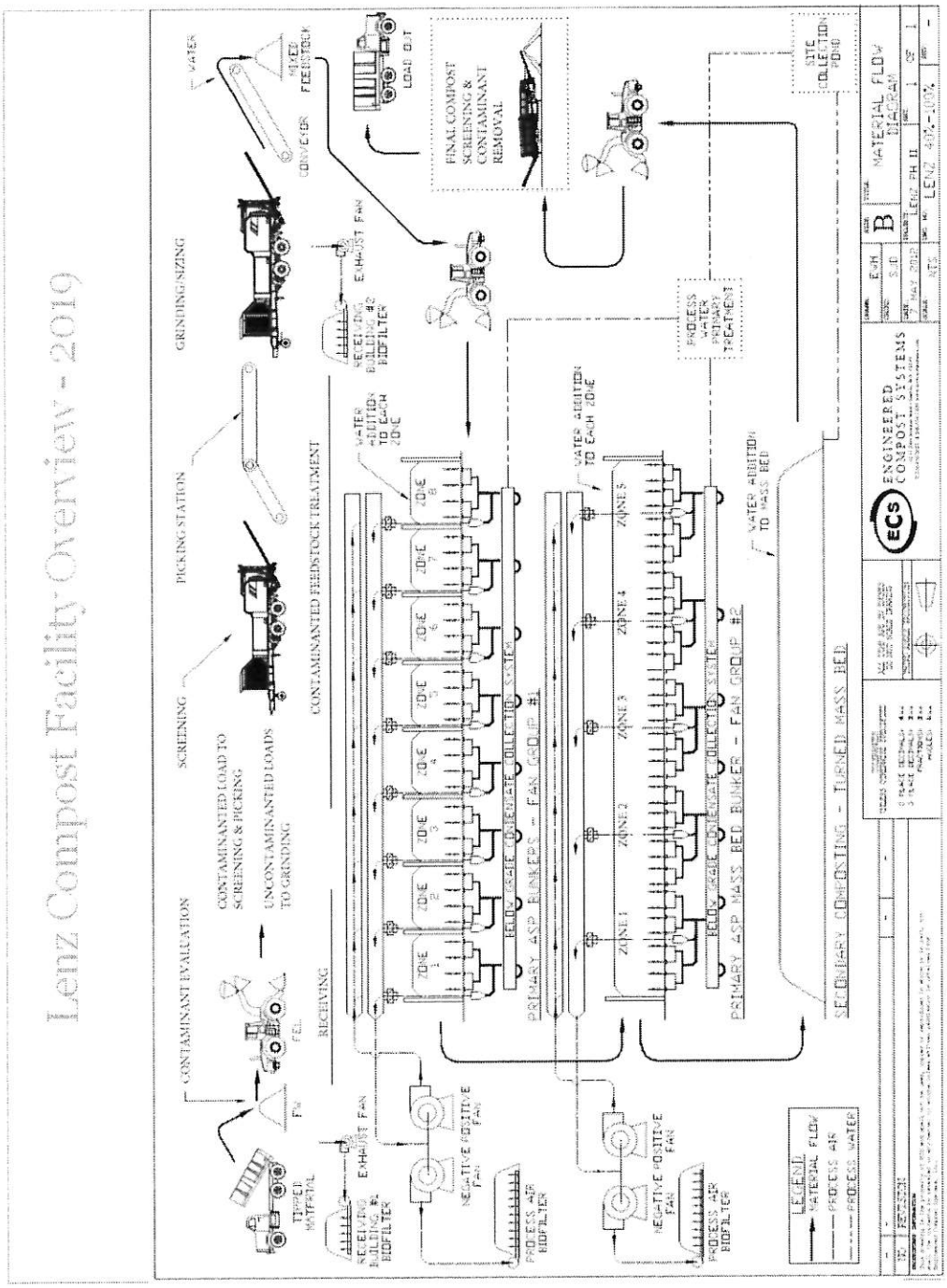
Other emission control strategies include good-housekeeping across the site and managing operations to minimize potential odor-generating activities (windrow turning, grinding, screening, etc.) on days when atmospheric conditions can enhance or transport odors.

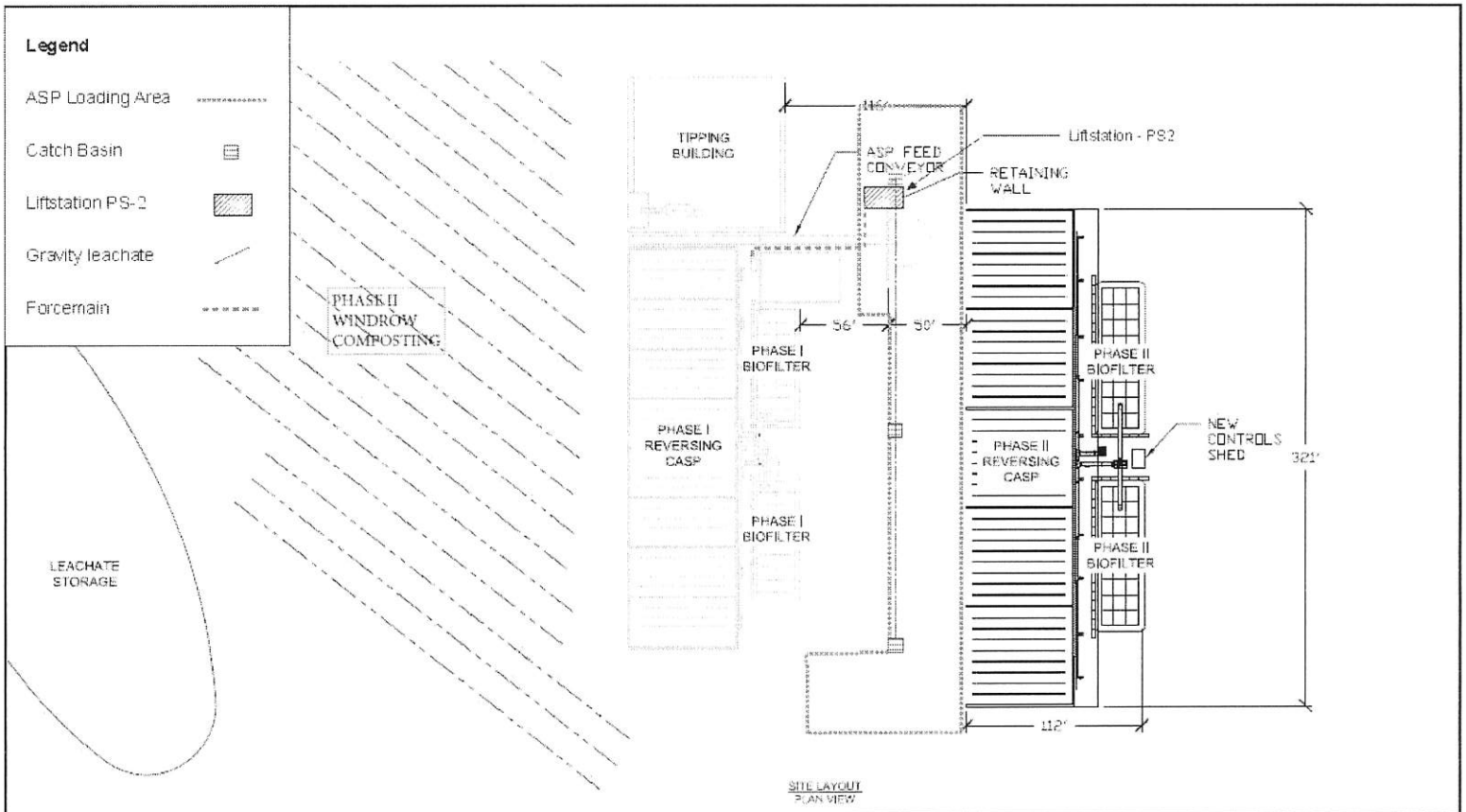
3) Amending high-energy compost feedstocks with high-carbon additives

High energy feedstocks are amended with either compost overs (the large woody portion of final screening) or land-clearing woody materials. The ration of amendment is dependent upon the character of the high-energy feedstock. This evaluation is made by our certified compost operators as needed.

More specific information on operation and maintenance of the facility is included in the attached Plan of Operation (POO) and Comprehensive Progressive Odor Management Plan (CPOMP).

V. APPENDIX A: Graphics and Schematics





NO	REVISION

LENZ ENTERPRISES
PHASE II COMPOST
FACILITY UPGRADES

- ASP LOADING AREA
- CATCH BASINS
- PUMP STATION

DRAWN:
CHECKED:
DATE:
SCALE: 1:300
SIZE:
TITLE: SITE LAYOUT
PROJECT:
SHT: 1 OF 3
DWG. NO:
REV:

GENERAL

LAYOUT DRAWINGS

COMPOST PROCESS EQUIPMENT
for the
REVERSING AERATION
CASP COMPOSTING SYSTEM

SUBMITTED FOR:

Lenz Enterprises Inc,
Stanwood Compost Facility, Phase II
5210 WA-532
Stanwood, WA 98292

272-038-G01 SHEET INDEX	
SHEET NO.	DESCRIPTION
1	COVER SHEET
2	FULL SITE LAYOUT
3	FAN GROUP LAYOUT
4	ABOVE GRADE DUCT
5	BELOW GRADE PIPE
6	SUMP DETAIL

NO	REVISION		
2	ELEVATION DETAILS ADDED	RDM	21 SEP 2018
1	AERATION TRENCH SPACING AND BIOFILTER LAYOUT ADJUSTED	RDM	11 SEP 2018

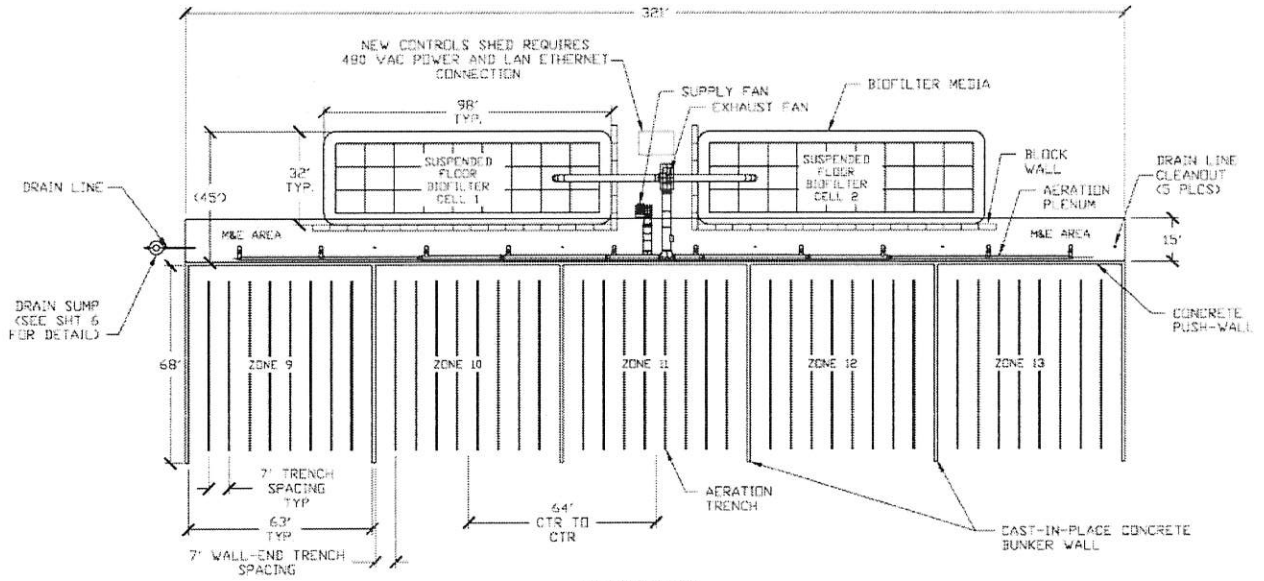
TOLERANCES
UNLESS OTHERWISE SPECIFIED
2 PLACE DECIMALS: ±.xx
3 PLACE DECIMALS: ±.xxx
FRACTIONS: ±xx
ANGLES: ±xx

ALL DIMS ARE IN INCHES
DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

ENGINEERED COMPOST SYSTEMS
4711 76th Avenue Way · Everett, WA 98203
T 206.634.2523 F 206.634.1525 www.compostsystems.com

DRAWN:	RDM
CHCKD:	CJH
DATE:	06 SEP 2018
SCALE:	N/A
SIZE	B
TITLE:	AERATION LAYOUT DRAWINGS
PROJECT:	P272-038 LENZ PH II
SHT:	1 OF 6
DWG. NO:	272-038-G01
REV:	2



FAN GROUP LAYOUT
PLAN VIEW
REVERSING CASP
LOW-FRICTION TRENCH FLOOR
5 ZONES, 64,000 TPY

LENZ ENTERPRISES INC PHASE II COMPOSTING SYSTEM

-	SEE SHT 1 FOR REVISION DETAILS	-	-
NO	REVISION		

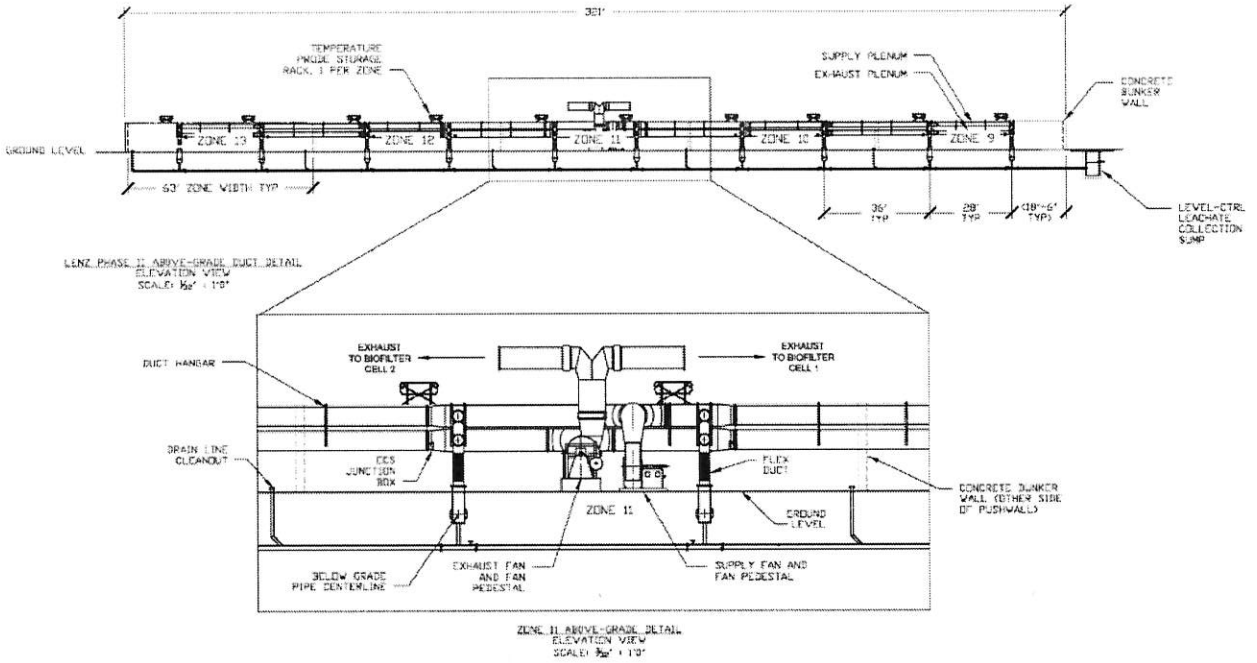
PROPRIETARY INFORMATION
(this drawing is the property of and shall not be used, copied or reproduced in whole or in part, and shall the contents be revealed in any manner to anyone unless written permission is obtained from Engineered Compost Systems, Inc.)

TOLERANCES
UNLESS OTHERWISE SPECIFIED
2 PLACE DECIMALS: ±.xx
3 PLACE DECIMALS: ±.xxx
FRACTIONS: ±.xx
ANGLES: ±xx

ALL DIMS ARE IN INCHES
DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION

ENGINEERED COMPOST SYSTEMS

DRAWN:	RDM	SIZE: B	TITLE: AERATION LAYOUT DRAWING
CHKD:	GJH		
DATE:	06 SEP 2018	PROJECT: 272-038 LENZ PH II	SHT: 3 OF 6
SCALE:	1/32"=1'	DRG. NO: 272-038-G01	REV: 2



ABOVE-GRADE DUCT ELEVATION

NOTE
ALL GEOLOGICAL, CIVIL, AND STRUCTURAL ENGINEERING BY OTHERS

NO	REVISION		
-	SEE SHT 1 FOR REVISION DETAILS	-	-

TOLERANCES
UNLESS OTHERWISE SPECIFIED
0 PLACE DECIMALS: #xx
3 PLACE DECIMALS: #xx
FRACTIONS: #xx
ANGLES: #xx

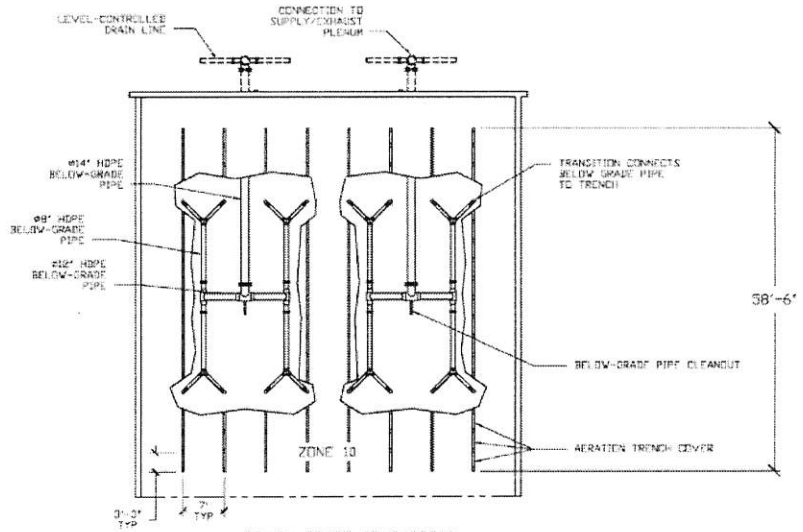
ALL DIMS ARE IN INCHES
DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

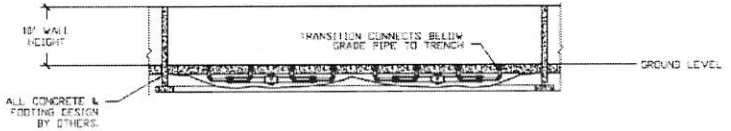
ENGINEERED COMPOST SYSTEMS

DRAWN: RDM	SIZE: B	TITLE: AERATION LAYOUT DRAWING	
CHKD: CJH			
DATE: 06 SEP 2018	PROJECT: 272-038 LENZ PH II	SHT: 4 OF 6	
SCALE: NOTED	DWG. NO: 272-038-G01	REV: 2	

NOTE:
LEACHATE SUMPS PROVIDED BY OTHERS. SUMPS REQUIRE WATER SUPPLY TO MAINTAIN LEVEL CONTROLLED AIR TRAP. SUMP OUT-FALL COLLECTION BY OTHERS



BELOW GRADE ZONE DETAIL
PLAN VIEW



BELOW GRADE ZONE DETAIL
ELEVATION VIEW

NO	REVISION
-	SEE SHT 1 FOR REVISION DETAILS

TOLERANCES UNLESS OTHERWISE SPECIFIED
2 PLACE DECIMALS: ±.xx
3 PLACE DECIMALS: ±.xxx
FRACTIONS: ±xx
ANGLES: ±xx

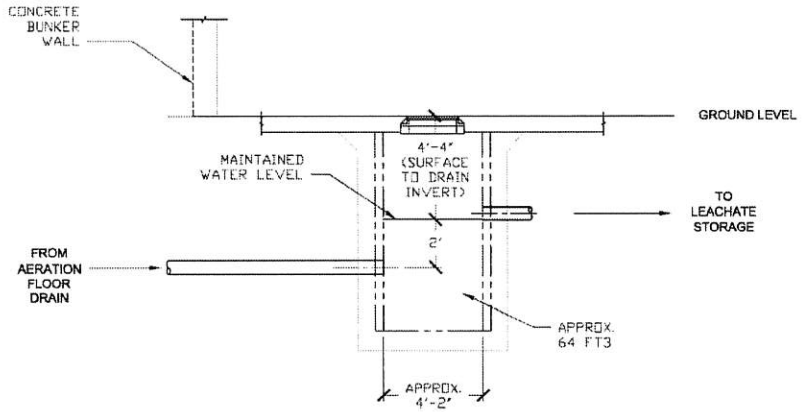
ALL SIZES ARE IN INCHES DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

ENGINEERED COMPOST SYSTEMS

DRAWN: RDM	SIZE: B	TITLE: AERATION LAYOUT DRAWING	
CHKD: CJH			
DATE: 06 SEP 2018	PROJECT: 272-038 LENZ PH II	SHT: 5 OF 6	
SCALE: 1/16" = 1'-0"	DWG. NO: 272-038-G01	REV: 2	

NOTE:
LEACHATE SUMPS PROVIDED BY OTHERS. SUMPS REQUIRE WATER SUPPLY TO MAINTAIN LEVEL CONTROLLED AIR TRAP. SUMP OUT-FALL COLLECTION BY OTHERS.



LEACHATE SUMP DETAIL
ELEVATION VIEW

NO	REVISION		
-	SEE SHT 1 FOR REVISION DETAILS	-	-

TOLERANCES UNLESS OTHERWISE SPECIFIED
2 PLACE DECIMALS: ±xx
3 PLACE DECIMALS: ±xx
FRACTIONS: ±xx
ANGLES: ±xx

ALL DIMS ARE IN INCHES
DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION

ECs ENGINEERED COMPOST SYSTEMS
431 29th Avenue West · Seattle, WA 98119
T 206.634.2621 F 206.634.1329 www.compostsystems.com

DRAWN:	RDM
CHCKD:	CJH
DATE:	06 SEP 2018
SCALE:	1/4" : 1'-0"
SIZE	B
TITLE:	1/4" : 1'-0" DRAWING
PROJECT:	272-038 LENZ PH II
SHT:	6 OF 6
DWG. NO:	272-038-G01
REV:	2

VI. APPENDIX B: Supporting Documentation

A. Updated Plan of Operation

B. Updated Comprehensive Progressive Odor Management Plan

C. Engineering Report per WAC 173-350-220

LENZ
ENTERPRISES

February 19, 2019

Puget Sound Clean Air Agency
1904 Third Avenue, Suite 105
Seattle, WA 98101-3317

Re: **Lenz Enterprises Inc. Commercial Composting NOC Modification**

Dear Permit Coordinator:

This application is being submitted to the Puget Sound Clean Air Agency to modify an existing Notice of Construction (No. 10494) for Lenz Enterprises located in Snohomish County. This application describes proposed new infrastructure and production rates.

This application includes the following documentation:

- Completed Notice of Construction Application for Order of Approval (Form 50-125P)
- Approved SEPA DNS and associated SEPA checklist for the site
- Updated SEPA checklist (applicable section only) to augment existing SEPA DNS (Refer to attached description requiring use of existing SEPA documents)
- Response to Additional Notice of Construction Application Requirements for Composting (Form 50-170)
- Engineering Report per WAC 173-350-220 submitted to Department of Ecology to modify the site Solid Waste Permit.
- Updated Plan of Operation
- Updated Progressive Odor Management Plan

The attached NOC application provides contact information for the filing fee associated with this submission.

Please let me know if you require additional information to process this submission or if you have any questions regarding the content of this submission.

Thank you.

Sincerely,

Edward Wheeler
Program Director | **Lenz Enterprises, Inc.**
P.O. Box 868 | 5210 SR 532 | Stanwood, WA 98292
360.654.6271 - ext. 6 (o) | 360.629.6213 (f) | 360.333.0516 (m)

State Environmental Policy Act (SEPA) Discussion

The Lenz Compost Facility is located within the Lenz Sand and Gravel Mine in Stanwood WA. A Conditional Use Permit (CUP) to expand all operations for the entire 108 acre site, including the composting facility, was approved in 2018 (SEPA No. 201801776). This SEPA decision included a review of all elements of the environment; however, estimates for emission were not included at that time because design of the compost facility expansion had yet to be completed. Therefore Lenz Enterprises Inc. is relying on existing SEPA documentation along with minor information in a new SEPA checklist (submitted herein) to fullfill SEPA for this expansion.

Regulatory reference:
WAC 197-11-330 states: (1) Agencies shall use the environmental checklist substantially in the form found in WAC 197-11-960 to assist in making threshold determinations for proposals, except for:
(a) Public proposals on which the lead agency has decided to prepare its own EIS; or
(b) Proposals on which the lead agency and applicant agree an EIS will be prepared; or
(c) Projects which are proposed as planned actions (see subsection (2) of this section); or
(d) Projects where questions on the checklist are adequately covered by existing legal authorities (see subsection (6) of this section);
(6) In the checklist provided to applicants, the lead agency for an environmental review under this chapter may identify questions on the checklist adequately covered by a locally adopted ordinance, development regulation, land use plan, or other legal authority. A lead agency still must consider whether the action has an impact on the particular element or elements of the environment in question.

If you have any questions regarding this process please give us a call or we can refer you to our legal counsel.

pscleanair.org
Puget Sound Clean Air Agency

Puget Sound Clean Air Agency
1904 Third Avenue, Suite 105 | Seattle, WA 98101-3317
Phone 206-343-8800 | 206-343-7522 Fax

ENVIRONMENTAL CHECKLIST

Because of the State Environmental Policy Act, the action for which you are filing a Notice of Construction and Application for Approval to this Agency requires the completion of an environmental checklist.

BUT: If you can answer "yes" to either of the following statements with respect to the action being proposed, the attached checklist need not be completed:

1. I have obtained a State, City, or County Permit and filled out an environmental checklist.

   ☒ Yes ☐ No

   If yes, complete the following:

   State, City or County Department: Snohomish County (SEPA 201801776)

   Date the checklist was completed: 5/1/17

   Attach a copy of the checklist

2. An environmental checklist or assessment has previously been filled out for another agency.

   ☐ Yes ☐ No

   If yes, complete the following:

   Agency: _____

   Date the checklist was completed: _____

   Attach a copy of the checklist

If your answers are NO to both of the above statements, you must complete the attached environmental checklist.

Prepared by:

Signature _____

Name Edward Wheeler

Position Program Director

Agency/Organization Lenz Enterprises Inc.

Date Submitted 2/19/19

ENVIRONMENTAL CHECKLIST

Date: 2/19/19

Proponent: Puget Sound Clean Air Agency

Project, Brief Title: Lenz Compost Facility Phase II

Purpose of Checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

Instructions for Applicants:

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for Lead Agencies:

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of Checklist for Nonproject Proposals:

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of Sections A, B, and C plus section D: Supplemental Sheet for Nonproject Actions.

Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Section B: Environmental Elements that do not contribute meaningfully to the analysis of the proposal.

ENVIRONMENTAL CHECKLIST

A. BACKGROUND

1. Name of proposed project, if applicable: Lenz Compost Facility Phase II			
2. Name of Applicant Lenz Enterprises Inc.			
3. Applicant Address PO Box 868	City Stanwood	State WA	Zip 98292
Applicant Phone 360.629.2933	Applicant Email edward@lenz-enterprises.com		
Contact Person Edward Wheeler	Title Program Director		
Company/Firm Lenz Enterprises Inc.			
4. Date Checklist Prepared 2/19/19	**5.** Agency Requesting Checklist PSCAA		
6. Proposed timing or schedule (including phasing, if applicable). Construction is scheduled for Summer 2019. Construction is expected to take 2-3 months.			
7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? ☐ Yes ☐ No. If yes, explain. Covered in SEPA decision 201801776			
8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal. A Conditional Use Permit and related SEPA checklist and for site was approved in 2018. This included critical areas review, hydrogeologic analysis, and groundwater monitoring plan all relevant to the compost facility expansion area.			
9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? ☐ Yes ☒ No. If yes, explain.			
10. List any government approvals or permits that will be needed for your proposal, if known. A modified solid waste permit will be required (Snohomish County Health and a modified Notice of Construction (PSCAA) will be required for the proposal.			

ENVIRONMENTAL CHECKLIST

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page.

Lenz is proposing to increase composting operations to process 150,000 tons of organic residuals annually at the Lenz Compost Facility (LCF). An additional 22,000 ft2 of ASP processing with engineered biofiltration and an additional 177,000 of windrow processing is proposed. Modifications to operations and management of the facility will also be implemented to facilitate this change.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

The LCF is located on the south side of Highway 532, approximately 3 miles east of Stanwood, Washington. The facility can be accessed from Interstate 5, traveling west approximately 2.5 miles from Exit 212. The site is within T32, S28, R04.

ENVIRONMENTAL CHECKLIST

B. ENVIRONMENTAL ELEMENTS

1. EARTH
a. General description of the site: ☐ flat ☐ rolling ☐ hilly ☐ steep slopes ☐ mountains ☐ other Covered in SEPA decision 201801776
b. What is the steepest slope on the site (approximate percent slope)? Covered in SEPA decision 201801776
c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them, and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils. Covered in SEPA decision 201801776
d. Are there surface indications or history of unstable soils in the immediate vicinity? ☐ Yes ☐ No. If yes, describe. Covered in SEPA decision 201801776
e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill. Covered in SEPA decision 201801776
f. Could erosion occur as a result of clearing, construction, or use? ☐ Yes ☐ No. If yes, generally describe. Covered in SEPA decision 201801776
g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)? Covered in SEPA decision 201801776
h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any: Covered in SEPA decision 201801776

ENVIRONMENTAL CHECKLIST

2. AIR

a. What types of emissions to the air would result from the proposal (i.e., dust, automobile, odors, industrial wood smoke, greenhouse gases) during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities, if known.

Commercial composting generates odor and VOCs. Estimates for VOCs are 0.6 pounds of VOC per ton of organics processed. Estimates for odor units (OU) are 0.4227 per ton of organics processed. Emissions will be generated by diesel engines used to power site equipment. Quantities are unknown. Dust will be generated by site equipment (loaders, grinders, screeners). Fugitive dust quantities are unknown.

b. Are there any off-site sources of emissions or odor that may affect your proposal? ☐ Yes ☒ No.
If yes, generally describe.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

The majority of commercial composting VOCs and odors are produced during the first 8-20 days of composting. Lenz proposes to maximize ASP residence time to capture and treat these VOCs and odors utilizing biofiltration. Optimization of the composting environment will be used as a BMP to minimize VOC and odor generation. Equipment used on site incorporates the highest efficiency engines, and emission treatment technologies, to reduce diesel consumption and related emissions from equipment. Dust will be mitigated using Best Management Practices (BMPs).

3. WATER

a. Surface

1. Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands) ? ☐ Yes ☐ No. If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

Covered in SEPA decision 201801776

2. Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? ☐ Yes ☐ No. If yes, please describe and attach available plans.

Covered in SEPA decision 201801776

3. Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

Covered in SEPA decision 201801776

4. Will the proposal require surface water withdrawals or diversions? ☐ Yes ☐ No.
Give general description, purpose, and approximate quantities if known.

Covered in SEPA decision 201801776

5. Does the proposal lie within a 100-year floodplain? ☐ Yes ☐ No. If yes, note location on the site plan.

Covered in SEPA decision 201801776

ENVIRONMENTAL CHECKLIST

6. Does the proposal involve any discharges of waste materials to surface waters? ☐ Yes ☐ No. If yes, describe the type of waste and anticipated volume of discharge.

Covered in SEPA decision 201801776

b. Ground Water

1. Will groundwater be withdrawn from a well for drinking water or other purposes? ☐ Yes ☐ No. If yes, give a general description of the well, proposed uses and approximate quantities withdrawn from the well.

Covered in SEPA decision 201801776

Will water be discharged to groundwater? ☐ Yes ☐ No. If yes, give general description, purpose, and approximate quantities, if known.

Covered in SEPA decision 201801776

2. Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: domestic sewage; industrial, containing the following chemicals...; agricultural; etc.). Describe the general size of the systems, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

Covered in SEPA decision 201801776

c. Water Runoff (including storm water)

1. Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? ☐ Yes ☐ No. If yes, describe.

Covered in SEPA decision 201801776

2. Could waste material enter ground or surface waters? ☐ Yes ☐ No. If yes, generally describe.

Covered in SEPA decision 201801776

3. Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? ☐ Yes ☐ No. If yes, describe.

Covered in SEPA decision 201801776

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, impacts, if any:

Covered in SEPA decision 201801776

ENVIRONMENTAL CHECKLIST

4. PLANTS				
a. Check the types of vegetation found on the site:				
Deciduous Trees:	☐ Alder	☐ Maple	☐ Aspen	☐ other (specify): Covered in SEPA decision 201801776
Evergreen Trees:	☐ Fir	☐ Cedar	☐ Pine	☐ other (specify): Covered in SEPA decision 201801776
☐ Shrubs				
☐ Grass				
☐ Pasture				
☐ Crop or Grain				
☐ Orchards, Vineyards, or other permanent crops				
☐ Other types of Vegetation (specify):				
Wet Soil Plants:	☐ Cattail	☐ Buttercup	☐ other (specify):	
	☐ Bulrush	☐ Skunk Cabbage		
Water Plants:	☐ Water Lily	☐ Eelgrass	☐ Milfoil	☐ other (specify):
b. What kind and amount of vegetation will be removed or altered? Covered in SEPA decision 201801776				
c. List threatened or endangered species known to be on or near the site. Covered in SEPA decision 201801776				
d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any: Covered in SEPA decision 201801776				
e. List all noxious weeds and invasive species known to be on or near the site. Covered in SEPA decision 201801776				

ENVIRONMENTAL CHECKLIST

5. ANIMALS

a. Indicate birds and other animals that have been observed on or near the site or are known to be on or near the site.

Birds:	☐ Hawk	☐ Heron	☐ other (specify): Covered in SEPA decision 201801776
	☐ Eagle	☐ Songbirds	
Mammals:	☐ Deer	☐ Bear	☐ other (specify): Covered in SEPA decision 201801776
	☐ Elk	☐ Beaver	
Fish:	☐ Bass	☐ Salmon	☐ Trout
	☐ Hearing	☐ Shellfish	☐ other (specify): Covered in SEPA decision 201801776

b. List any threatened or endangered species known to be on or near the site.

Covered in SEPA decision 201801776

c. Is the site part of a migration route? ☐ Yes ☐ No. If yes, explain.

Covered in SEPA decision 201801776

d. Proposed measures to preserve or enhance wildlife, if any:

Covered in SEPA decision 201801776

e. List any invasive animal species known to be on or near the site.

Covered in SEPA decision 201801776

6. ENERGY AND NATURAL RESOURCES

a. What kinds of energy (electric, natural gas, oil, woodstove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

Covered in SEPA decision 201801776

b. Would your project affect the potential use of solar energy by adjacent properties? ☐ Yes ☐ No. If yes, generally describe.

Covered in SEPA decision 201801776

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

Covered in SEPA decision 201801776

ENVIRONMENTAL CHECKLIST

7. ENVIRONMENTAL HEALTH
a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste that could occur as a result of this proposal? ☐ Yes ☐ No. If yes, describe: Covered in SEPA decision 201801776
2. Describe any known or possible contamination at the site from present or past uses. Covered in SEPA decision 201801776
3. Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity. Covered in SEPA decision 201801776
4. Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project. Covered in SEPA decision 201801776
5. Describe special emergency services that might be required. Covered in SEPA decision 201801776
6. Proposed measures to reduce or control environmental health hazards, if any: Covered in SEPA decision 201801776
b. Noise
1. What types of noise exist in the area that may affect your project (for example, traffic, equipment, operation, other)? Covered in SEPA decision 201801776
2. What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example, traffic, construction, operation, other)? Indicate what hours noise would come from the site. Covered in SEPA decision 201801776
3. Proposed measures to reduce or control noise impacts, if any: Covered in SEPA decision 201801776

ENVIRONMENTAL CHECKLIST

8. LAND AND SHORELINE USE
a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? ☐ Yes ☐ No. If yes, describe. Covered in SEPA decision 201801776
b. Has the project site been used as working farmlands or working forest lands? ☐ Yes ☐ No. If yes, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use? Covered in SEPA decision 201801776
1. Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? ☐ Yes ☐ No. If yes, how? Covered in SEPA decision 201801776
c. Describe any structures on the site. Covered in SEPA decision 201801776
d. Will any structures be demolished? ☐ Yes ☐ No. If yes, what? Covered in SEPA decision 201801776
e. What is the current zoning classification of the site? Covered in SEPA decision 201801776
f. What is the current comprehensive plan designation of the site? Covered in SEPA decision 201801776
g. If applicable, what is the current shoreline master program designation of the site? Covered in SEPA decision 201801776
h. Has any part of the site been classified as a critical area by the city or community? ☐ Yes ☐ No. If yes, specify. Covered in SEPA decision 201801776
i. Approximately how many people would reside or work in the completed project? Covered in SEPA decision 201801776

j. Approximately how many people would the completed project displace?

Covered in SEPA decision 201801776

k. Proposed measures to avoid or reduce displacement impacts, if any:

Covered in SEPA decision 201801776

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

Covered in SEPA decision 201801776

m. Proposed measures to ensure the proposal is compatible with nearby agricultural and forest lands of long-term commercial significance, if any:

Covered in SEPA decision 201801776

9. HOUSING

a. Approximately how many units would be provided, if any? Indicate whether high- middle- or low-income housing.

Covered in SEPA decision 201801776

b. Approximately how many units, if any, would be eliminated? Indicate whether high- middle- or low-income housing.

Covered in SEPA decision 201801776

c. Proposed measures to reduce or control housing impacts, if any:

Covered in SEPA decision 201801776

10. AESTHETICS

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

Covered in SEPA decision 201801776

b. What views in the immediate vicinity would be altered or obstructed?

Covered in SEPA decision 201801776

c. Proposed measures to reduce or control aesthetic impacts, if any:

Covered in SEPA decision 201801776

ENVIRONMENTAL CHECKLIST

11. LIGHT AND GLARE

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

Covered in SEPA decision 201801776

b. Could light or glare from the finished project be a safety hazard or interfere with views?

Covered in SEPA decision 201801776

c. What existing off-site sources of light or glare may affect your proposal?

Covered in SEPA decision 201801776

d. Proposed measures to reduce or control light and glare impacts, if any:

Covered in SEPA decision 201801776

12. RECREATION

a. What designated and informal recreational opportunities are in the immediate vicinity?

Covered in SEPA decision 201801776

b. Would the proposed project displace any existing recreational uses? ☐ Yes ☐ No. If yes, describe.

Covered in SEPA decision 201801776

c. Proposed measures to reduce or control impacts on recreation, including recreational opportunities to be provided by the project or applicant, if any:

Covered in SEPA decision 201801776

13. HISTORIC AND CULTURAL PRESERVATION

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers located on or near the site? ☐ Yes ☐ No. If yes, specifically describe.

Covered in SEPA decision 201801776

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

Covered in SEPA decision 201801776

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.

Covered in SEPA decision 201801776

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

Covered in SEPA decision 201801776

14. TRANSPORTATION

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on-site plans, if any.

Covered in SEPA decision 201801776

b. Is site or affected geographic area currently served by public transit? ☐ Yes ☐ No. If yes, generally describe. If not, what is the approximate distance to the nearest transit stop?

Covered in SEPA decision 201801776

c. How many parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate?

Covered in SEPA decision 201801776

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? ☐ Yes ☐ No. If yes, generally describe (indicate whether public or private).

Covered in SEPA decision 201801776

e. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation? ☐ Yes ☐ No. If yes, generally describe.

Covered in SEPA decision 201801776

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?

Covered in SEPA decision 201801776

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? ☐ Yes ☐ No. If yes, generally describe.

Covered in SEPA decision 201801776

h. Proposed measures to reduce or control transportation impacts, if any:

Covered in SEPA decision 201801776

15. PUBLIC SERVICES

a. Would the project result in an increased need for public services (for example, fire protection, police protection, public transit, health care, schools, other)? ☐ Yes ☐ No. If yes, generally describe.

Covered in SEPA decision 201801776

b. Proposed measures to reduce or control direct impacts on public services, if any:

Covered in SEPA decision 201801776

16. UTILITIES

a. Indicate utilities currently available at the site:

☐ Electricity	☐ Natural gas	☐ Water	☐ Refuse Service
☐ Telephone	☐ Sanitary Sewer	☐ Septic System	☐ Other (specify):

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity that might be needed.

Covered in SEPA decision 201801776

C. SIGNATURE

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.	
Signature	
Name	Edward Wheeler
Position	Program Director
Agency/Organization	Lenz Enterprises Inc.
Date Submitted	2/19/19

Lenz Compost Facility, Stanwood WA
Plan of Operation

2019

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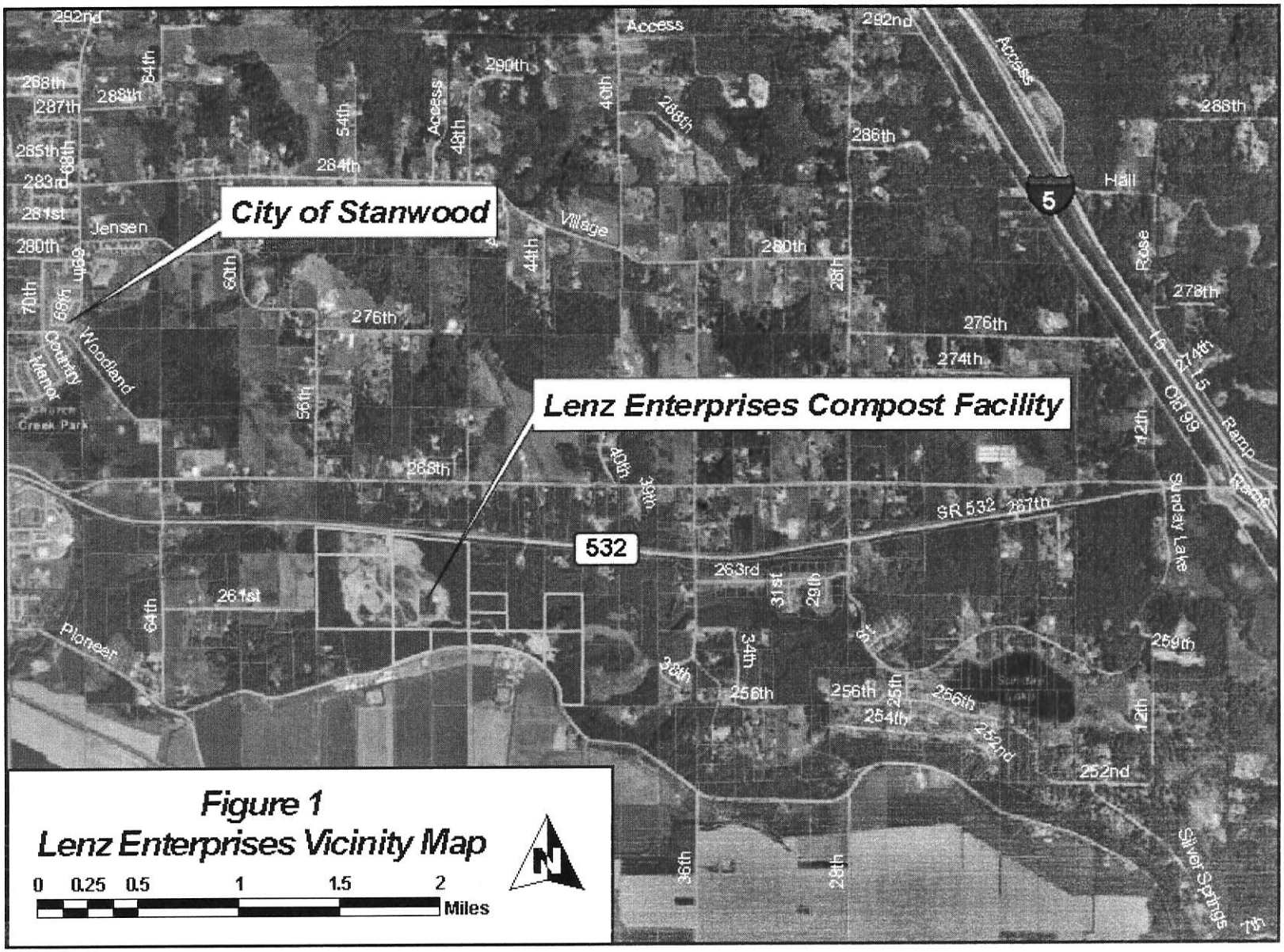


Figure 1. Location Map

I. Introduction

Overview

Lenz Enterprises, Inc. is a family-owned and operated earth materials and services company that has been serving Western Washington as a family-based operational facility since 1976 and as a Washington State corporation since 1985. The Lenz Enterprises facility is situated on approximately 160 acres in Snohomish County located just east of Stanwood. Lenz Enterprises has built a reputation for providing prompt, skilled service, and for stocking a full range of quality products from gravel to topsoil to mulch. The Lenz Compost Facility (LCF) began operations in 2008 and is permitted to process feedstocks as defined by Washington Administrative Code (WAC) 173-350-110 and site specific permits. Site operations are conducted in accordance with all rules, regulations, permit requirements, and the provisions of this Plan of Operation.

The mission of the LCF is to preserve and enhance the environment and create local sustainable environmental solutions by providing cost effective composting of organic materials from commercial, residential, industrial and municipal customers. The LCF strives to create a service beneficial the region by providing alternatives to landfilling. Quality soil amendments and landscaping products are the primary products derived from this process.

Purpose and Objectives

The purpose of this document is to describe acceptable methods of operation in compliance with all laws, rules and regulations; and to ensure a safe work place for site personnel. This document aligns with Chapter 70.95 Revised Code of Washington (RCW), WAC 173-350 requirements; and Snohomish County Code Title 7: Health and Sanitation.

Objectives include reducing impact to the environment through responsible recycling of organics; reduction of Greenhouse Gases (GHG); landfill diversion of solid waste, and production of a useful product. Regulatory objectives include:

- Develop, keep and abide by this plan of operation approved as part of the permitting process
- Convey to site personnel the concept of operation intended by the designer
- Make this plan available for inspection at the request of the jurisdictional health department
- Work with the jurisdictional health department to ensure the plan meets regulatory expectations

This Plan of Operation is a living document which requires review and update to ensure continual improvement of site activities.

Facility Description

The Lenz Compost Facility (LCF) is located within 108 permitted acres of land in Snohomish County, Washington designated as Mineral Resource Lands. Operations are accessed by an all-weather gravel road. Composting activities occur on approximately eight acres of land and all active composting occurs on a pad meeting the requirements of WAC 173-350.

Active composting includes:

Phase 1 Composting: High-Rate Phase, Aerated Static Pile (ASP) composting with controlled forced airflow plenum (negative airflow - top down; positive airflow - bottom up; or no airflow) with constant temperature monitoring;

Phase 2 Composting: Stabilization Phase, Windrow composting with manual temperature and gas production monitoring; and may include:

Phase 3 Composting: Curing Phase; Turned or Unturned composting. This material may be screened or unscreened. Curing occurs for some materials based on the maturity of the product after Phase 2 Composting and the ultimate use of the final product.

The LCF is designed to ensure that compost meets WAC 173-350-220 regulatory requirements before leaving Phase 2 composting. Compost may, or may not be cured on site depending upon product demand and the requested character of the final product.

The LCF system begins with on-time handling of received organics, and mixing and grinding of the material. The first stage of composting used on site is the Aerated Static Pile (ASP) method of composting. System controls for the LCF ASP were developed by Engineered Compost Systems (ECS). The ASP method uses aeration trenches installed in concrete beneath the compost pile; aeration trenches are connected to electric blowers that provide either positive or negative aeration. Positive aeration forces air into the compost pile and negative aeration draws air through the pile. Application of the ECS ASP methodology allows for precise temperature and moisture control during the initial phase of composting resulting in efficient destruction of pathogens, rapid stabilization of compost and reduced VOC generation. This high-rate process is characterized by high oxygen uptake rates, thermophilic temperatures, and high biodegradable volatile solids (BVS) reductions.

The next stage of composting is the Windrow Stabilization Phase. During the Windrow Stabilization Phase the compost continues to undergo biological stabilization. This process occurs under similar conditions to Phase 1 composting only compost conditions (i.e. temperature, moisture, aeration, etc.) are controlled by turning the compost rather than by forced aeration. This stage of composting is characterized by lower biological activity resulting in lower oxygen uptake rates than Phase 1 composting and lower temperatures.

The third stage of composting (Curing), when needed, is characterized by lower temperatures than the previous processes and reduced oxygen updated rates. The Curing Phase provides time for degradation of the more refractory organics and re-establishes lower temperature microbial populations, which are beneficial in creating mature compost.

The Lenz facility includes:

- Weigh Scales
- Organics Receiving Area
- Organics Pre-Processing And Post-Processing Equipment
- Contaminant Removal Picking Station (as needed)
- Contaminant Removal Equipment and Screens
- Material Grinding and Mixing Equipment
- Aerated Static Pile Equipment and Controls
- Leachate Collection, Treatment and Reuse Facilities
- Finished Product Screening and Storage Facilities

Lenz Enterprises compost facility meets all mandated local, state and federal operating requirements, some of which include time and temperature for providing pathogen control and stability of finished compost products.

The compost facility is permitted through the Snohomish County Health District (Permit No. SW-106) and the Puget Sound Clean Air Agency.

Site Access, Contact Information, Location and Typical Hours of Operation

Access

Site access is from SR 532 as shown on the Site Vicinity Map in Figure 2.

Site Contact

Lenz Enterprises Inc.

P.O. Box 868

Stanwood, WA 98292

Attn: Jason Lenz

Email: jason@lenz-enterprises.com

Phone: 360.629.2933

Hours of Operation

Typical hours of operation for receiving and processing feedstocks is 7:00 a.m. to 5:30 p.m., Monday through Saturday.

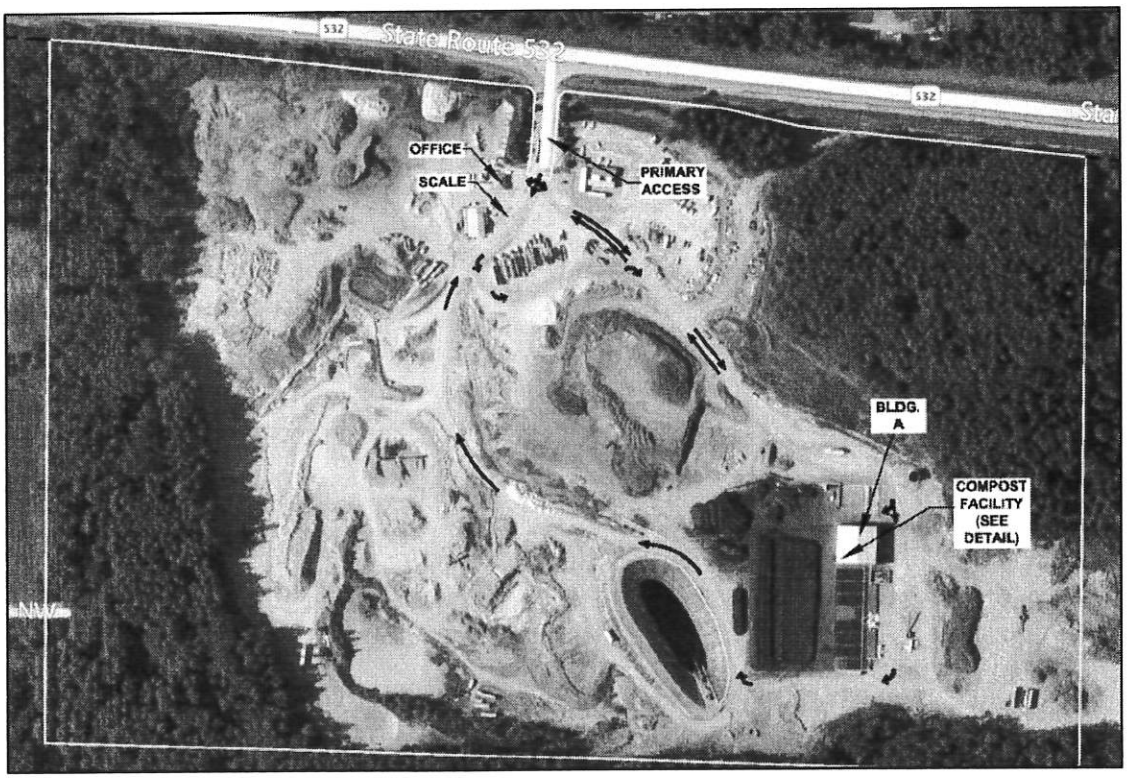


Figure 2. Lenz Enterprises Facility Overview

II. List of Feedstocks

The composting process at the LCF begins with proper identification and sourcing of feedstocks. Acceptable feedstock shall be limited to organic materials meaning any solid waste that is a biological substance of plant or animal origin capable of microbial degredation Organic materials include, but are not limited to manure, yard debris, food waste, food processing wastes, wood wastes, yard waste, yard waste mixed with food waste, pre-consumer food waste, post-consumer food waste, wood and paper fiber, untreated wood waste that is free of paint, agriculture crop waste, wax coated cardboard, animal manure and bedding, paunch waste and shell.

Feedstock Sources

Sources of feedstock for the Lenz Enterprises compost facility may include solid and semi-solid organic wastes generated by residential, commercial, municipal and industrial sources. Source examples include: home, lawn, landscaping and mowing services; municipal yard, garden and food-waste collection; construction and land clearing service companies; solid waste collection facilities; animal slaughterhouse facilities; cold storage facilities; pre-consumer food processing facilities; orchards, produce farms organic farms, and viniculture; home gardeners; and other residential, commercial, municipal and industrial sources that have similar organic feedstocks.

Unacceptable materials include feedstocks, not identified by site specific permits such as, liquid wastes, non-herbivorous animal manure, wood waste containing chemical preservatives of paint, biosolids and similar materials.

Feed Stock Acceptance Criteria

Once a potential feedstock is identified, a characterization assessment is conducted to ensure that the feedstock meets permit conditions. If the origin of the material is unambiguous and meets the feedstock criteria as defined by permits, then the material may be accepted. If the origin of the material is ambiguous or from a source that is not typical, additional assessment will be conducted. This may include a review of generators, handling, pre-sorting, trucking, and holding times at a minimum. Laboratory analyses may be performed on a representative sample if necessary to ensure that the feedstock meets acceptance criteria. If during any part of the feedstock assessment questions arise as to the acceptability of the material, a consultation and determination with the Snohomish County Health Department (SCHD) will be requested.

Table 1. Examples of organic materials accepted at Lenz Enterprises, contaminating materials, and prohibited materials.

Allowable Materials	
Compostable paper	Food waste
Cardboard	Manures (herbivore only)
ASTM compostable films and containers	Produce
Branches, leaves, grass, and brush	Bread
Non-painted wood, non-treated lumber	Animal bedding
Non-painted wallboard	Saw dust
Commercial food scraps	Stumps
Meat and dairy waste	Approved manufactured compostables
Contaminating Materials (removed or rejected)	
Textiles, carpet, upholstery	Shrink wrap and Styrofoam,
Diapers	Shoes, leather, non-compostable fibers
Plastic film and rigid plastics	Concrete
Tires/rubber	Brick
Ceramics	Tile
Glass	Metal

Asphalt and Asphalt roofing	Grease and other non-compostable materials
Prohibited Materials (not allowed at Lenz Enterprises)	
Hazardous waste	Household hazardous waste
Medical waste	Feces
Special/designated waste	Painted and treated wallboard
Painted and treated wood	Contaminated soils
Appliances: white, brown, grey goods	Universal waste and e-waste
Liquid waste	Biosolids

III. Description of Organics Handling

Entrance to the site occurs from State Route 532, approximately three miles west from Interstate-5. Scales are located at the site entrance. An all-weather gravel road leads from the scales to the compost site, approximately 500 feet from the site entrance. Incoming trucks carrying compost feedstock are received and weighed at the scale house. Daily weight records are maintained by the scale operator entering feedstock quantities. Haulers are directed to follow the signs to the processing area; for safety and efficiency during winter operations, directional signs are reflective. Incoming loads are weighed in, identified, and directed to the appropriate unloading area.

Materials are received and unloaded at the facility as quickly as possible. Lenz Enterprises strives to maintain streamlined conditions at its scale house to avoid potential delays and processes loads in a timely manner. After delivery of organic materials, trucks return to the scales following the route shown on Figure 3.

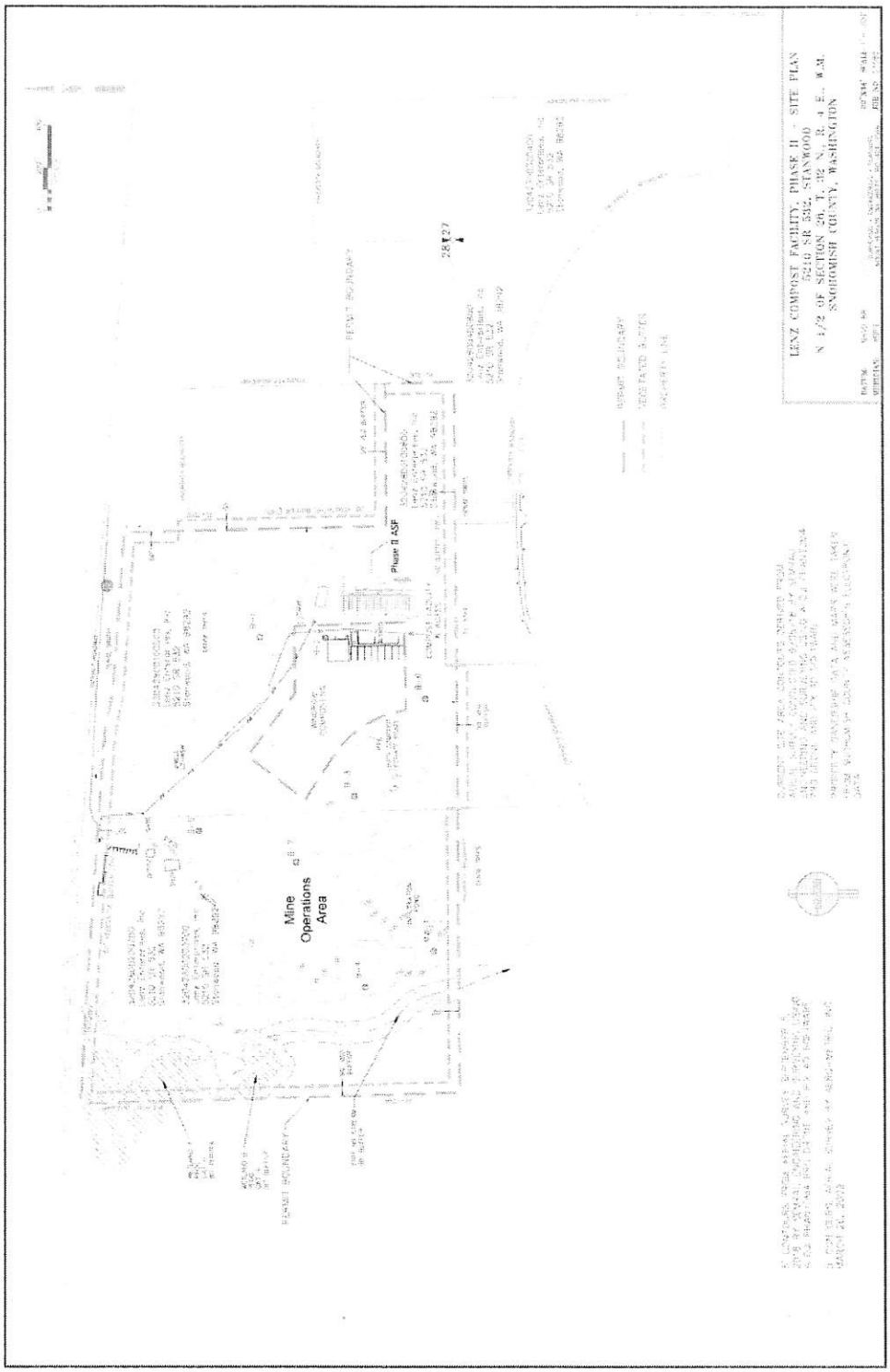


Figure 3. Lenz Compost Facility Overview

The organics receiving area includes a 180 foot by 103 foot open air concrete slab for receiving and storing feedstocks and a 10,000 square foot steel tipping and processing building (Building A) enclosed on three sides. Building A includes an air collection and handling system to capture potential odors from

the processing of organics and routes this air through a biofiltration system for treatment prior to discharge to the environment.

Organic feedstocks primarily are unloaded in Building A. Material is then sorted and processed. Putrescible feedstock is always unloaded within Building A. Self-haul yard waste drop-off occurs adjacent to the processing building; if grass is included in the self-haul organics, it is immediately moved to the processing building. The self-haul delivery area is shown in Figure 4. Commercial, industrial and municipal organics and putrescible feedstocks are unloaded in the main receiving are of Building A and are inspected after unloading to ensure that loads meet site acceptance criteria.

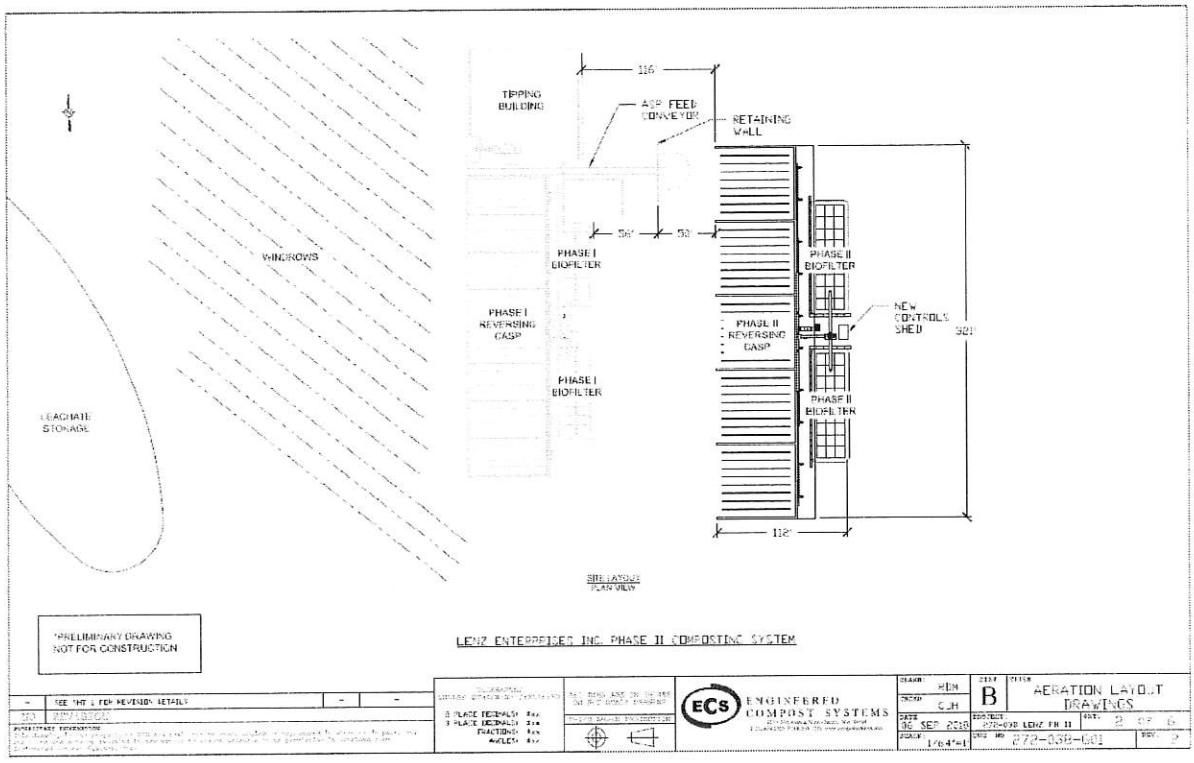


Figure 4. Lenz Compost Facility Detail

Organic material largely consisting of yard waste from commercial sources (e.g., landscapers) is also directed to Building A. Current practice dictates that grass and grass mixed loads be directed to slightly separate unloading area from the brush and wood. Wet organics such as paunch manure, food waste, and grass are also unloaded within Building A. Small quantity generators (e.g. local, residential self-haul customers) are directed to either the yard waste receiving pad located as shown on Figure 4 or to the small quantity generator sealed bins located near the site entrance.

Upon receipt of approved loads of organic materials, primary processing commences. If material is received bagged, the bags are broken open using a loader or equivalent mechanism. If the bags are Lenz-approved compostable bags, they will remain with the yard debris. Non-compostable bags are removed and disposed of at a licensed landfill or other approved disposal location with other non-compostable materials gleaned from the input stream. Brush and woody debris are separated and ground in the existing Lenz Enterprises wood waste processing area on the site.

Food waste, because of its potential putrescibility and vector attraction characteristics, is immediately incorporated with on-site yard debris (ground or unground) and other bulking agents as necessary. Other compostables are managed based on their putrescibility through grinding or bulking, as conditions dictate.

At a minimum, two employees are involved in the management, processing and handling of incoming and finished materials at this site. This is for operational and safety reasons and to ensure proper and efficient operations.

Organic residuals delivered to the site from curb-side recycling will be manually picked through, after grinding, but before delivery to an ASP bay for Phase I composting.

IV. Procedures for Handling Unacceptable Wastes

Prior to unloading, each load will be inspected to confirm contents and to observe levels of potential contaminants. If contaminants are as described in contractual agreements, as defined based on the current LCF operations plan, or are observed to be de minimis, the load may be discharged. The load will continue to be inspected during and after tipping to assess contaminants content; site personnel will also inspect the offloaded materials.

If contaminant content is observed by site personnel to be excessive, the load is not discharged and is turned away from the facility. Any load that is partially or fully discharged and determined to include excessive non-compostable contamination will require validation of the extent of contamination. Validation is conducted based on protocols mutually acceptable to Lenz and commercial customers if a contract is in place; and by regulatory requirements or restrictions.

For loads deemed to be unacceptable, Lenz Enterprises site equipment is used to re-load materials onto the transfer vehicle for return per contract specifications when applicable. If possible, and also based on a mutually agreed upon protocols, partial loads may be rejected and acceptable portions processed.

In the event that, at any point in the contaminant inspection process, the site operator is temporarily occupied with other activities and direct inspection is not possible, the daily records will be compared to loads received and any hauler responsible for delivering unacceptable loads will be notified to return to the site to retrieve the unacceptable materials; or the materials will be handled by LCF site personnel if other handling agreements are in place. A video camera located at the compost office is directed toward the unloading areas to assist in monitoring unloading activities.

Waste materials delivered to the site, classified as Municipal Solid Waste (MSW), and not suitable for composting, will be:

- Removed from the site within twenty-four hours or placed in an on-site covered dumpster.
- Storage of MSW will occur in such a manner as to prevent rodents, insects, and other animals from accessing the contents as a food source.
- Putrescible solid waste will be removed from the site to a permitted solid waste handling facility no less than once per week.
- All MSW will be disposed of at a permitted solid waste handling facility.

V. Mass balance calculations for feedstocks

Composition of the initial compost mix is one of the most critical factors in developing successful compost and reducing potential odors. Organic materials must be properly blended to provide the nutrients that support microbial activity and growth, including a balanced supply of carbon and nitrogen (C:N ratio); and proper physical characteristics.

Determining the appropriate mix ratio for feedstocks and bulking agents requires knowledge about the material properties and requirements of the composting process. Feedstock volume and character can vary by season. Green wastes from residential sources, for example, increase in the spring and continue through late fall. Commercial and industrial sources can also fluctuate based on seasonal or product

demand. These types of variations require the operator to assess each feedstock to be mixed for each batch and make determinations based on experience and knowledge of the feedstock.

When prior knowledge of feedstocks is not available mass balance calculation can be useful in determining appropriate mix ratios. Mass balance calculation for feedstocks and amendments are dependent upon several factors including:

- Carbon to Nitrogen Ratio (Target range 20:1 – 40:1)
- Volatile solids (Target range is dependent upon other material composition)
- Moisture Content of Mix (Target range 40-65 Percent)
- Particle Size and Exposed Surface Area on Feedstocks (Dependent upon feedstock character and use for compost)
- Interstitial Space (Target 30%)
- Bulk Density (Target range 800 – 1,000 lbs/yd^3)

LCF personnel have several calculations available to them in an Excel spreadsheet format for ease of use and consistency in results.

An example of average carbon-to-nitrogen ratios, moistures and densities for types of feedstocks typically accepted at the LCF is shown below. Additional information on a wider variety of feedstocks is included in the LCF Feedstock Calculator.

Information on currently processed feedstocks is included in Table 2.

Ingredient	Season/Time Frame	Purpose
Paunch Manure	Year-Round	Nitrogen & Wetting Agent
Yard Debris Self Haulers	Year-Round but more in Spring and Fall	Porosity & Nutrients
Yard/food waste & curbside collected	Year round	Porosity & Nutrients
Land clearing, stumps, Brush & Hogged fuel	Year round	Porosity & Carbon
Paper Fiber, Wood fiber, wood shavings & Saw dust	Year round	Carbon and Drying Agent
Pre-consumer food Waste	Occasional	Porosity & Nutrients

The volume of incoming organic feedstocks currently varies by season. A quarterly characterization for different seasons, along with the general type of materials produced is provided below:

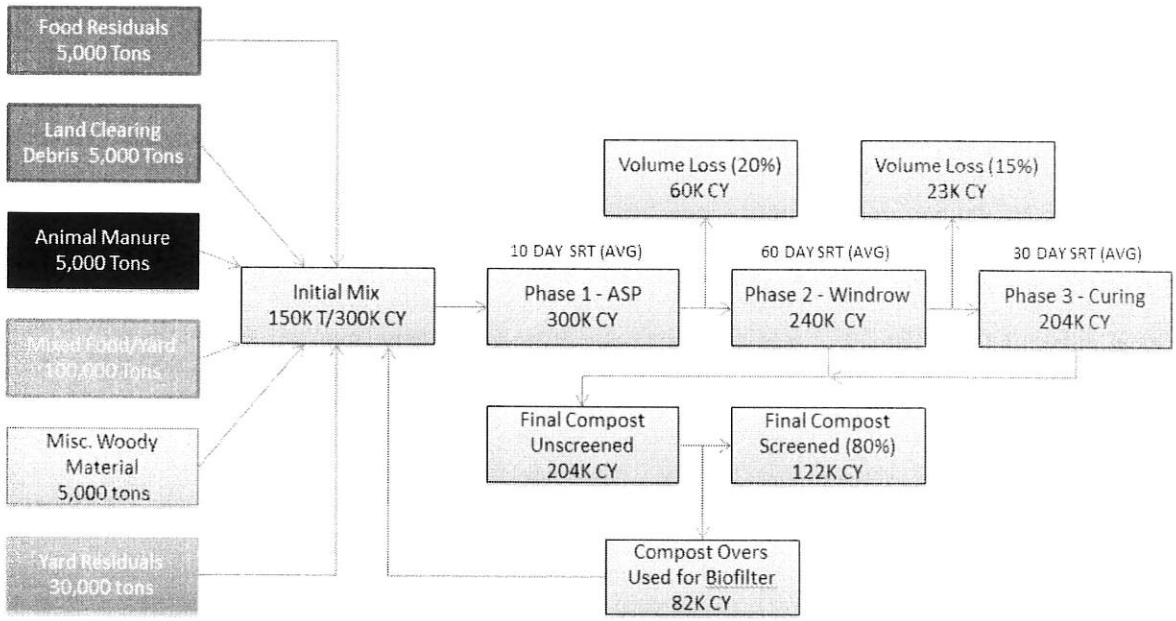
- First Calendar Year Quarter – Organic feedstocks consist primarily of brush and yard waste, lacking in nitrogen.
- Second Quarter – Organic feedstocks consist primarily of curb-side recycled organics that may contain up to 10 percent food waste.
- Third Quarter – similar to 2nd quarter but less quantity.
- Fourth quarter – Incoming organics consists of leaves, pumpkins, Christmas trees, corn stalks, and food waste.

Future feedstock source development will consider overall LCF mix requirements prior to acceptance or contractual agreements. This evaluation will consider feedstock character, volume/mass per unit time, seasonal variations and special considerations where applicable. This type of evaluation is required prior to acceptance of each new feedstock to ensure a proper balance of feedstocks are available in the correct quantities to maximize compliant and efficient compost operations.

Annual Mass Balance Flow Chart

The following Mass Balance Flow Chart illustrates approximate measurements of materials processed annually.

Lenz Compost Facility Mass Balance Flow Chart 150K Tons Organics



VI. Material flow plan

Material flow can generally be categorized into the following:

- Incoming Organics Handling (Feedstocks)
- Acceptance and stockpiling of bulking agents
- Feedstock Preparation (grinding, mixing, conditioning)
- Phase 1 ASP Composting (Pile Construction, Aeration, Monitoring)
- Phase 2 Windrow Compost Stabilization (turning and monitoring)
- Phase 3 Compost Curing
- Screening
- Material Return (Used as compost cover, used as part of bio-filter)
- Finished Compost Storage, Mixing and Sales

Material flow is illustrated in Figure 5.

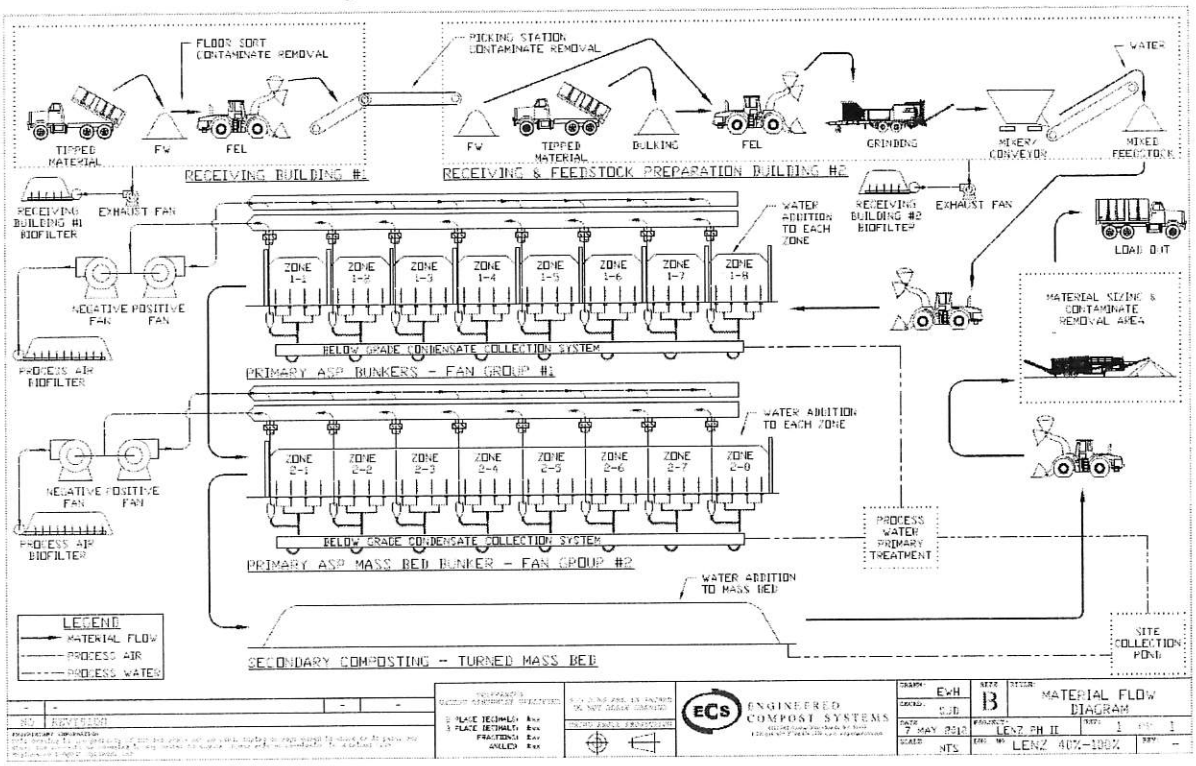


Figure 5. LCF Material Flow

Composting at Lenz Enterprises includes controlled biological stabilization of organic materials. The composting process is optimized to yield a desired and valuable end product. Biological processes are optimized by combining feedstock received in the correct proportions and maximizing site design conditions and then actively managing critical environmental parameters.

Lenz Enterprises accepts organic feedstocks that include yard debris and other vegetative waste from commercial and residential sources. Lenz Enterprises' compost permit, SW-106, issued by Snohomish Health District, allows for processing feedstocks defined in WAC173-350-220 and permit conditions.

Lenz Enterprises processes feedstock at the facility based on customer need and peak throughput capacity. The majority of the expected feedstock includes:

- yard debris;
- pre-consumer vegetative food waste;