NRWS Covered Aerated Static Pile (CASP) Composting Operations Fact Sheet

CASP: General

CASP Basic Components	*Quantity*	*Unit*	*Comment*
Annual permitted throughput	63,590	Tons (wet)	315 wet-tons/day
CASP zones	20	#	Each zone can be identified by the probe rack
Tons per zone (approx.)	380-400	Tons	Estimated using bulk density
Temperature probes per zone	5	#	2-foot depth, recorded hourly
Sprinkler heads per zone	5	#	30-foot diameter coverage per sprinkler, frequency and duration adjustable and automatic
Fan groups	4	#	5 zones per fan group
Biofilter minimum thickness	6	Inches	Coverage on all exposed feedstock surfaces
Aeration spargers (holes)	3,300	#	165 holes per zone
Dampers	20	#	1 damper per zone (orange box on ducting)
Active phase	22	Days	Requires biofilter
Curing phase	40	Days	Total composting process 62 days
Total process length	62	Days	22 days active and 40 days curing
Cubic yards per static curing pile	475	Cubic yards	Estimated using bulk density

CASP: Zone and Pile Dimensions

Zone/Pile	*Height*	*Length*	*Width*	*Biofilter*	*Comment*
Active CASP zone	9 feet	94 feet	30 feet	6 inches minimum	Total pile height after 24 hours is 10 feet (after settling)
Curing CASP zone	12 feet	94 feet	30 feet	none	Typically use 4 zones for curing
Curing static pile	8 feet	100 feet	20 feet	none	Static piles are not windrows (they are not turned)

CASP: Composting Process Components

CASP Component	*Description*
CASP	Manufactured and designed by Engineered Compost Systems (ECS) for high-rate, high-temperature composting that optimizes bacterial breakdown when proper environmental conditions are provided.
Biofilter	Covers all exposed surfaces of raw feedstock on each zone, biofilter may consist of mature compost, wood chips as processed wood chips, unscreened finished/mature compost product, or compost overs. Biofilter layer provides odor and organics emissions control and insulates the pile to help attain uniformly high temperatures required during PFRP (Process to Further Reduce Pathogens).
Temperature probes	Probes measure and record hourly temperature of the material at a depth of 24 inches, the temperatures are used by the control system as a feedback signal to control the proportional louvered damper at each zone and maintain pile temperature set points identified by each regime.
Automatic irrigation	Automatic, wall-mounted, timer-controlled water spray system is manually placed on the top of each zone and connected to the water valve located about each zone's concrete wall. CompTroller allows the irrigation system to be automated by specifying the irrigation time and frequency as needed.
Comptroller user interface	Allows operator to access all CASP settings, view all system data, control fan and damper settings, monitor temperatures and control irrigation frequencies. CompTroller also allows the operator to input manual overrides as needed.
Fan groups	Centralized aeration system consisting of ducting, fans, dampers (which modulate airflow to zones), and variable frequency drives (which control and regulate fan speeds).
Feedstock types	Feedstock types include yard waste, food waste, digestate, manure, pomace, ground wood, and saw dust. Feedstock is blended and mixed to ensure optimal bacterial decomposition. The carbon rich feedstocks act as a wood-based bulking agent which provide energy sources to bacteria during decomposition as well as porosity and structure to ensure sufficient airflow to the pile. Nitrogen rich feedstocks provide nitrogen to the bacteria to build proteins. Carbon rich feedstocks are typically lower in moisture whereas nitrogen rich sources have greater moisture content.
Lab parameters	Various parameters are monitored and sampled throughout the composting process including: C:N ratio, bulk density, pH, moisture content, temperature, oxygen content, and material stability and maturity. The Solvita test is used to test stability during the active to curing transition and maturity at the end of the curing phase.
Positive Aeration	Provides metabolic oxygen and cooling air to aerated static compost piles delivered upward from the floor to the top of the composting material. Sufficient oxygen to the pile is critical to maintain aerobic composting conditions and to prevent anerobic decomposition.
Water types	Freshwater is only used during active and curing phases. Additionally, the automatic irrigation system is only connected to freshwater. Liquid captured from the curing process may be used during zone loading to inoculate the feedstock with microbes and provide moisture. Restrictions on water type usage is to ensure the prevention of any contamination during the process.
Curing system	The curing system is an open area with a floor of concrete slabs and is used for material in the curing phase. The CASP zones can be used for active composting or curing whereas the curing system is only used for curing material. The curing system requires a water truck applying freshwater on piles as necessary to maintain moisture content. Curing piles, unlike windrows (which are turned), are static piles that remain untouched for the duration of the curing phase.