Juneau Composts! LLC
Operating Plan
October, 2018

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Purpose and Need

1. Conserve limited landfill space
2. Promote recycling
3. Provide locally made soil amendment
4. Reduce dependence on imports and exports

Given that the landfill has a limited capacity, things that could have another life should remain out of the landfill. Organics can be transformed into a valuable product (unlike a broken doll or couch), so they are a resource as opposed to trash. In the landfill organics create methane, a harmful greenhouse gas. When organics are composted and applied to land they sequester carbon and help offset greenhouse gas emissions. The diversion of paper and metal have been standard for decades. Organics are simply another category of items to be source- separated and recovered for recycling. With the recent crash of the plastics market and China's rejection of our recyclables, the authenticity and fate of recycling is highly unstable. Since composting can happen locally, it is a dependable and environmentally sound way to support landfill diversion and recycling. The end-product of the composting process is actually a sought-after resource to many people. It is a great soil amendment that can be used in private and commercial gardens, on lawns and public landscapes, and on roadside reclamation projects. By manufacturing local compost food producers are less reliant on imported soil and soil amendments. More local food production also means less imported food. When our landfill closes our trash will be barged out of town, which has high costs, both monetarily and environmentally. Keeping organics out of the mix (upwards of 40%), trash costs will be less.

Table 1 - Pounds of food waste composted by calendar year

Year	Total Pounds	Total Gallons	Customers Served
2012*	20,937	5,631	20 residential, 4 businesses
2017	32,484	14,876	75 residential**, 8 businesses
2018			135+ residential, 7 businesses

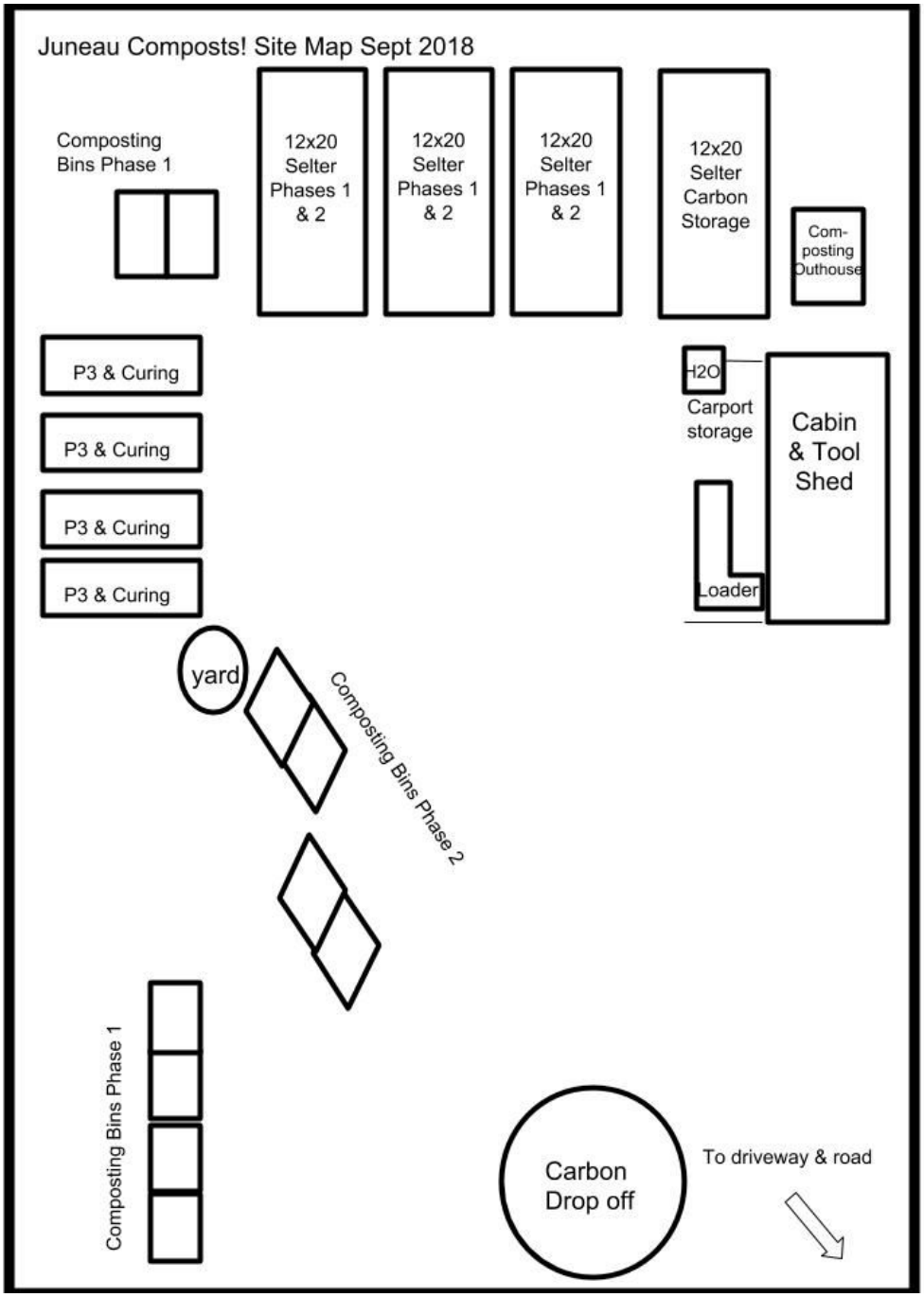
* Pilot project

**Started with 3 customers, and grew to 75 over the course of the year

Facility

The compost site is about 70’x100’ on a gravel pad and is located on private property near 25 mile in Rural Reserve.

Site Diagram



Process Description

The precise process is constantly changing due to the changing demands of the business. As volume has increased the space requirements and handling times have changed. The current process is as follows:

The driver collects compost door-to-door, emptying the 5-32 gallon buckets/cans into the 45 gallon cans in the truck. Volume is estimated as each receptacle is dumped, then recorded. The material is brought to the site, where it is weighed and processed. The truck is backed up to the active Phase 1 bin. Lids and biofilter material are pulled back and the day's organics are dumped and layered into the bin along with on-hand carbon. Caron sources include leaves, moss, paper, sawdust, wood shavings, wood chips, straw, and "overs" from previous batches of finished compost. Carbon is also used to create a "nest," which lines the edges of the bin so food scraps do not protrude. A final addition of carbon is added to the top to act as a biofilter. The lids are replaced and shimmed as necessary, and plastic mesh fencing is used to cover exposed portions of the pile as needed. The driver returns the truck and bins to the owner's residence, where the buckets and cans are washed and stored. Residual scraps are caught in a filter and composted in a tumbler bin on-site.

A Phase 1 bin is added to until it is full, which is typically 2-3 weeks. It quickly heats to 140 degrees F and is allowed to compost thermophilically for 1-2 months. Piles are built with passive aeration in mind, so turning is not necessary for the initial breakdown of food. Keeping turning to a minimum keeps odors down and lowers the chance of problems with neighbors and wildlife. As the pile cools it is actively aerated by using a piece of rebar to create a grid pattern of holes into all accessible sides of the pile. Temperature rises again. As room in Phase 2 bins allows, the pile is forked into the front end loader (some bins allow for direct scooping) then dumped into a wire-sided Phase 2 bin. There it reheats to 140 degrees F and undergoes another round of thermophilic composting. After about 1 month in Phase 2 it is turned onto a raised windrow to reheat for Phase 3. After several weeks to in Phase 3 the pile is turned one last time onto another windrow area for final curing. It will remain there as long as needed or required by time, weather conditions, and season.

After a pile has completed it's thermophilic composting process and aged for several months a small test batch is sifted. It undergoes a Solvita respiration test, which tests compost maturity by analyzing ammonia and carbon emissions. The results can be used to determine how to next process the material or, if it is mature, what its ideal end-use may be. If the results are in the high-value end-use range a bioassay is performed to ensure proper plant growth. The compost is placed in a seedling flat, where a variety of crops are trialed, including leafy greens, brassicas, tomatoes, and cucurbits. Flats of two other brands of compost are are also trialed under the same conditions to provide comparison. Turf King and

organic Dr Earth bagged compost are used as the controls. If the results of the grow trial are positive the batch will undergo sifting and bagging. The sifter is a shaker screen with ⅜" mesh. The "overs" are sorted into a pile and bagged for reuse as a carbon source. The "fines" (finished compost) pile onto a tarp until they are bagged by hand into grain sacks in 5-10 gallon volumes. Finished compost is delivered to subscribing customers several times a year. Customers are notified by email and Facebook announcement when a batch is ready and they can request a free delivery. Extra compost is sold for $10 per 5-gallon bag.

Composting Challenges and Solutions

Wildlife:
Birds, bears, and rodents could potentially get into the piles and create sanitation and safety problems. All piles are covered with several inches of biofilter on all sides so as not to attract animals in the first place. Windrows are covered with ComposTex covers, which are waterproof yet breathable. Bins are covered with wooden lids and mesh fencing. Dogs and cats are kept on site and have established their territory. They deter scavenging animals and keep wild rodent populations in check. Electric fencing has been purchased but has not been installed since the site has evolved and sprawled constantly. The new shelters should be completed by winter, afterwich the western part of the site will no longer be needed a simple, rectangular fence can be installed.

Rain and snow:
Precipitation is kept off of the compost at all stages, from the initial collected organics to the final delivered product. This minimizes leachate and runoff, fosters prime composting conditions, and creates a primo product. Snow is cleared using the loader, shovels, and a shop broom. One consolidated building that sheds snow would be ideal.

Freezing temperatures:
If most of the food scraps are frozen at collection time, starting a brand new pile can be challenging. Material from an active hot pile can be used to seed a new batch and kickstart the thermophilic process. Freezing temperatures have little effect on initial compost processing once temperatures begin to rise. Piles that are older and cooled will freeze nearly solid in the winter, so turning is restricted and even delayed well into spring depending on where the pile is situated. Freezing temperatures mean the hose line freezes, so washing buckets becomes a feat in hauling water. In less severe conditions the hose can be drained and kept indoors until needed. When the main line is frozen three 15-gallon totes are filled with water and bleach solutions and set up into a rinse, wash, rinse line outside.

Contamination:
Contamination is minimal. Residential customers are paying for a service that is not required, so they tend to be people who are highly motivated to manage waste responsibly. Food scraps from business and events tend to have plastic contamination. “Paper” cups, fruit and vegetable stickers/bands, and utensils (plastic and metal) are the most prevalent items. They are sorted out when spotted and convenient--mostly at sifting time.

Odor:
Aerobic composting typically has a mild odor, which is more farm than landfill. Generally the compost site has no odor except on turning days, which always occur on weekdays to avoid neighborhood disturbances. Nuisance odors can occur when piles become anaerobic or if there is insufficient carbon or biofilter. This typically can be avoided. When trialing new compost recipes test batches are kept small as to potentially avoid large problems that are harder resolve.

Location:
The site is situated in Rural Reserve, which is permitted by the CBJ. Having residential neighbors is less than ideal, however, so compost management is tailored to minimize odor and noise encounters. We also want to limit traffic to the site, so we do not offer drop-off of material unless it is by the large truck load and has been prearranged.

The distance from town deters carbon producers from delivering material that otherwise gets landfilled or stockpiled with no end-use. Because of this we sometimes have to purchase carbon shipped in from Washington. We have offered to pay large producers for delivery with limited success. We have recently partnered with Waste Management and the CBJ Recycleworks to have a fall “leaf event.” The landfill is acting as a transfer station for leaves: residents drop them off for free and we collect them once a week.

An additional site challenge is that it has no city or well water, which prevents buckets from being washed on site. A water catchment system was recently set up and will provide limited water starting next spring. For now washing buckets at my personal residence suffices.

The snow load is significantly greater at 25 mile than in town, so snow management takes up considerable time. The road conditions are often questionable on the return trip to town as that part of town is not a priority for the plow trucks. Four wheel drive and slow driving are essential.