

Comments on Brian Critchlow Open Letter:

This letter by Mr. Critchlow is intended to disparage a well-designed project before it has an opportunity to prove itself based on a comparison to an ill-conceived and poorly managed project called Nu Earth Organics that operated in Waukegan from approximately 2008 through 2014. The letter's author touts himself as the Former Site Manager for Nu Earth Organics when in fact the day to day operations for the compost activities were managed by either Carl Kupfer or Jose Zepeda. Carl is listed in the original application and Jose's name is in on a later permit application for Nu Earth as the site manager. In a conversation with Jose Zepeda, he stated that Mr. Critchlow was responsible for the mulch operation at the site and that he (Jose) was responsible for the composting portion during years the site operated and that he had little communication with Mr. Critchlow.

Site Operator

Reference: Permit Application 2010-558 DE/OP; 2011-465

8.8.1 Site Personnel

The Facility will be maintained and operated by the full-time Facility Manager, Carl Kupfer. The Facility Manager will be responsible for:

8.1.1 Site Personnel

The Facility is being maintained and operated by the full-time Facility Manager, Jose Zepeda. The Facility Manager is responsible for:

Incoming Volume

The property that Nu Earth operated on consisted of 5.5 acres on which they initially proposed to compost 155,000 cubic yards of landscape yard waste, produce scraps and urea (manure) using a method called Eco-pods under the trade name Ag-Bag. This method is seldom used in the compost industry due to the cost of the bags (one time use) and inability to access the pile to remedy moisture content and porosity during active composting. The site permit was later modified to use the aerated static pile method and the volume was scaled back to 93,150 cubic yards per year:

Reference: Permit Application 2010-558 DE/OP

## .8.2 Waste Materials

The Facility will handle general landscape waste and produce scraps brought to the Facility by landscape contractors, municipalities, and landscape waste haulers in truck beds and enclosed packer trucks generally between the months of April and December.

Average daily gate volumes for general landscape and produce ~~waste scraps~~ will be 470 c.y., and 1000 c.y. for leaf materials. *Produce (fruit and vegetable waste) scraps may not exceed 10% by volume of the total daily feedstock entering the Eco-pods. The total annual volume of produce scraps shall not exceed 15,525 c.y. If urea is used in addition to produce scraps, the total of these additives shall not exceed 10% by volume of the total daily feedstocks.* The respective peak day gate volumes are expected to be about 700 c.y. and 2000 c.y. The annual total capacity of the Facility is 155,250 c.y.(43,500 tons), or 31,050 c.y.(8,700 tons) per cycle. *Refer to the table of capacities included in Appendix D.1.*

Reference: Permit Application 2011-465

### 8.1.1 Volume and Weight of Feedstock and Compost

As was previously reported, the composting area has the capacity to accept 56@180-foot long, 450 c.y. Eco-Pods, or 5 aerated static piles@ 6,210 c.y. each. The total volume in either case is 31,050 c.y. per cycle. In-place density of the composting feedstock is 850 lb/c.y.

The contained composting period during the period mid-April through October averages 60 days, followed by a 60 day curing period. Three 120 day cycles are expected during any given calendar year.

The winter cycle, commencing in December, will comprise mostly leaves, and non-grass organic additives. The maximum annual in-place volume is: 3 cycles @ 31,050 c.y. per cycle= 93,150 c.y.

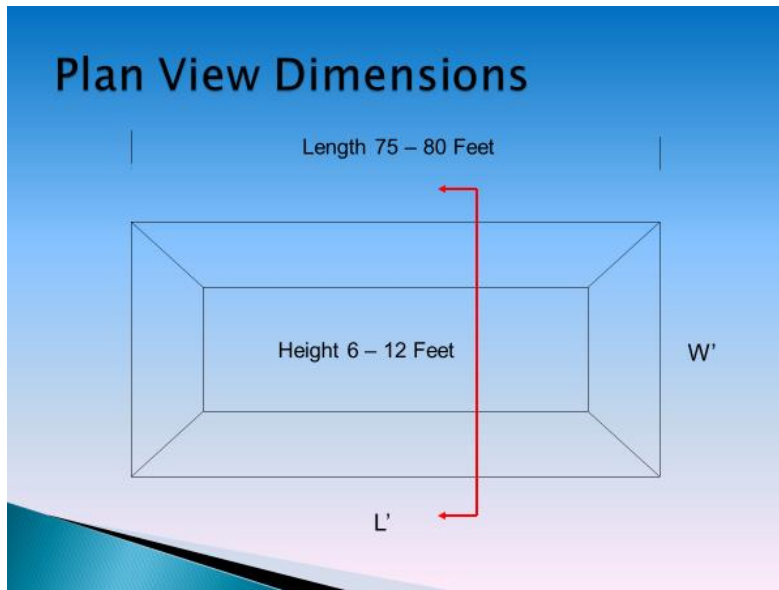
#### COMMENT:

The average volume per acre composted per year at Nu Earth ranged from 17,000 cubic yards per acre to 29,200 cubic yards per acre. This volume of material was extremely aggressive for a site the size of Nu Earth and likely contributed to the odor issues due to lack of operating space to stage incoming material properly and cutting the time of active composting.

### Aerated Static Pile Composting

The later method used by Nu Earth after the Ag Bag proved unsuccessful, was to use the aerated static pile (ASP) method whereby a fan pump delivers air through perforated pipe surrounded by wood chips to diffuse the air into the pile. The Nu Earth design called for ASP's 152 feet long at the bottom and 138 feet long at the top with a height of 16 feet. The recommended maximum configuration for an ASP is shown below:

Ref. O2 Compost, Snohomish, WA



The reason for maintaining the ASP's at the recommended dimension is to allow sufficient air to reach the furthest end of the pile from the air pump and to prevent the weight from collapsing the pile and densifying it to the point where adequate porosity no longer exists and air cannot move through the pile.

The recommended cover for the ASP's is a biofilter consisting of unscreened compost or a synthetic tarp material. In either case, the cover must remain moist either by adding moisture to the biofilter or the underside of the tarp must be kept moist. Covered ASP's using a tarp typically use a specially laminated synthetic material designed to maintain a film of moisture while allowing air movement from the pile. It is in the moisture layer where odor containing gases are consumed by microorganisms.

As part of permit application 2011-465, Nu Earth requested to increase organic additives (food scrap) up to 50% of incoming volume:

Reference: Application Log 2011-465

#### 8.1.1 Composting Process

Composting will be conducted using the encapsulated Eco-Pod system and the aerated static pile technology. Feedstock, consisting of landscape waste materials and up to 50% organic

additives, is ground, blended and bulked with woody matter to achieve the desired C/N balance

The photos below were taken at the Nu Earth site during ASP construction.



Photo Number 1



Photo Number 2



Photo Number 3



Photo Number 4



Photo Number 5

COMMENT:

Nu Earth constructed their ASP's twice the length and height recommended for this method of composting (see photo 1). This caused anaerobic conditions to occur in the pile due to lack of air to the farthest section of the pile and lack of air diffusion as the weight of the pile collapsed on itself. The result was odor release after the piles per uncovered. The poly tarp used for the cover did not allow for air diffusion nor did it allow for a moisture layer to form that would then filter gases moving up from the pile. The small vents and cloth covers installed (photo 4) were inadequate to mitigate odor release. Nu Earth increased their organic additives to 50% which, combined with the poor layout of the ASP, further hastened the pile density, restricted air flow and led to anaerobic conditions during active composting. The high percentage of food scrap likely resulted in carbon to nitrogen ratio lower than the recommended ratio in order to prevent excessive nitrogen gases to form. The restricted air movement due to extreme length and height of the piles would lead to excessive heat build-up that at some point could create internal temperatures for combustion to occur. The large extended pile width prevented access to mitigate problem conditions in the pile when they occurred (see photos 2 and 3).

The staging area for unloading and mixing food scrap was on the ground surface out in the open. The led to odors from loads to leave the site before they could be addressed. This was important when food scrap could not be mixed immediately after its receipt.

The compost pad for the ASP construction was not graded to a 2% slope as required by IEPA regulation for proper drainage. The permit application stated that the pad was constructed of compacted clay and asphalt screenings. Asphalt screenings are a durable material that allows vertical percolation but due to

the small particle size, does not allow horizontal movement. A layer of porous material should have been placed between the compacted clay and asphalt screening to prevent ponding of surface water.

### Proximity to Receptors

Given the poor layout and cramped operating conditions at the site, combined with the lack of separation distance to receptors, the options for odor mitigation measures were limited and their effectiveness compromised. A K-Mart parking lot was located immediately adjacent to the south of the property and a large mobile home park was located 1000 feet west. There was minimal vegetation barrier screening between the facility from both the mobile home park subdivision and K-mart lot.

### Odor Control Plan

The odor control plan for Nu Earth consisted of two paragraphs in the permit application and contained little detail about attention paid odor prevention, detection and mitigation.

Reference: Application Log 2011-465

#### 8.1.1 Odor Control

Bad loads of landscape waste and odorous organics will not be accepted at the Facility. Trucks will be checked by the yard clerk upon arrival and will be rejected if deemed unacceptable.

By nature of design, the aerobic composting processes prevents the production of objectionable odors throughout the composting cycle. Neither the Eco-Pods nor the aerated static piles will be opened and exposed until fully cured. "Odor Colonel" and similar control agents will be readily available on-site for application as needed. In the event that perceived odor complaints are received, the Facility Manager will ensure that each complaint received is recorded and reported to the Agency within 24 hours of receipt. The complaint record shall include the date and time of the complaint, address and phone number of complainant (if volunteered), the name of the personnel receiving the complaint, and will submit it to the Agency within 7 days of the complaint.

#### 8.10.4.1 Odors

The encapsulated aerobic composting process prevents the production of objectionable odors. Bad loads of waste will not be accepted at the Facility. Trucks will be checked by the yard clerk upon arrival and will be rejected if deemed unacceptable. In the event of odor issues with incoming waste, an odor control agent will be applied to the load.

#### COMMENT:

The odor control plan for the Nu Earth facility was inadequate given their the cramped conditions, poor ASP layout and proximity to receptors.

### Comparison to Patriot Acres

There is little similarity to the Nu Earth compost facility location, layout, operation and odor control plan when compared to Patriot Acres.

The site manager for Patriot Acres, John Lardner, PE, has over 15 years of experience and training related to compost design and operation and has received certification as a Certified Manager of Compost Programs.

The ratio of property size at Patriot Acres will initially start out at 4,000 cubic yards per year per acre and gradually increase to 8,000 cubic yards per year. This volume can easily be handled without creating cramped operating conditions that encourage short cuts. This is much less than the 17,000 to 28,000 cubic yards per acre at Nu Earth.

The staging area for Patriot Acres will be a free span building with a paved floor where loads can be monitored for odors and then mixed without the risk of their escaping from the site. At Nu Earth, incoming loads of food scrap and landscape waste were unloaded to an open bare ground surface.

The extended aerated static piles proposed at Patriot Acres are properly sized to; complete the active compost stage while maintaining aerobic conditions; prevent excessive heat build-up; and will allow the installation of a biofilter layer maintained with proper moisture content. Construction of the aerated static piles will be closely monitored by the site manager. The aerated static piles at Nu Earth were twice as large in length and height than recommended for proper active stage composting.

The surface of the compost pad will be a layer of recycled asphalt grindings underlain by a porous layer of recycled brick that will allow horizontal movement of surface water that infiltrates the grindings. The Des Plaines landfill slope exists at a three percent grade that will promote surface water movement through the porous layer. Storm water collected from the facility will be stored in a membrane lined pond to prevent downward movement into the landfill cap. Storm water at Nu Earth was allowed to accumulate and let stand on the compost pad due to poor drainage features consisting of a very slight ground slope and lack of a porous under layer material to convey it to the storm water collection pond.

The odor control plan for Patriot Acres is twenty-one pages and includes steps for odor monitoring using a Nasal Ranger to measure dilution thresholds of observed odors. The odor control plan for Nu Earth consisted of two paragraphs less than one page long.

Lastly and most important, the location of Patriot Acres offers a superior combination of natural and manmade buffers from receptors. The closest residential subdivision is over 2,500 feet from the compost facility and the active compost stage aerated static piles have over 500 hundred feet of separation distance to the property boundary. Nu Earth had less than 50 feet separating its aerated static piles from the property boundary with that of a neighboring retail shopping area.