SMCWPPP C.3 Workshop
August 18, 2021

Biotreatment Soil Media
Submittal Review Procedures

Peter Schultze-Allen, CPSWQ
EOA, Inc.

SAN MATEO COUNTYWIDE Water Pollution Prevention Program

EOA inc.

Presentation Overview

- Background on the BASMAA Biotreatment Soil Media (BSM) specification
- Overview of the submittal review process
- Common issues
- Installation Tips

Background on the BASMAA BSM Specification

- First version adopted in 2011 as Attachment L of MRP 1.0
- Updated in 2016 as a regional BASMAA product
- BASMAA no longer exists; however, we are continuing to use the name and website
- Several issues may prompt another update in 2022:
  - The drought and water-holding capacity of the BSM
  - Problems and issues noted in the current spec
- BSM Submittal Review Checklist was first developed in 2014 and updated in 2016 and 2021

Overview of the Submittal Review Process

1. Check the BSM sample - should be sandy/compost mix.
2. Best to use the BASMAA “BSM Specification Verification Checklist” (or Verification Statement) - typically submitted by the contractor or project engineer.
3. Review laboratory reports, if needed for clarification or more details (but the point of the Verification Checklist is to make checking lab reports unnecessary).
4. If something fails in the Verification Checklist, check for a statement from the supplier or contact EOA.

Sample BSM and Compost Photos

The BSM should look like the sample in this photo - compost and sand and smell like soil

Here is a sample of just compost for comparison

SAN MATEO COUNTYWIDE Water Pollution Prevention Program

EOA inc.

Review of BSM Verification Checklist

1. Should be provided by contractor or design team
2. Laboratory testing reports should have recent dates: Within the last 120 days (4 months)
3. The Checklist has an introduction and four parts:
    1. Attachment A - info from the BSM Supplier
    2. Attachment B - info from the Sand Laboratory
    3. Attachment C - info from the Compost Laboratory
    4. Attachment D - info from the Compost Supplier

Biotreatment Soil Media
Specification Verification Checklist

This checklist is intended to supply municipal staff, contractors, designers and others with an easy-to-read summary of the information needed to verify that the biotreatment soil media being provided by the soil media supplier meets the soil media specification in the Bay Area Stormwater Management Agencies Association (BASMAA) "Specification of Soils for Biotreatment or Bioretention Facilities" dated April 18, 2016. The checklist should be provided to the soil media supplier by the municipality or contractor before the soil media has been ordered to allow for sufficient time to compile the information and time to review the completed checklist before delivery of the soil media to the job site.

Use of this checklist is not required by the MRP and is intended only for assistance in reviewing submittals. Additionally or alternatively, the one page Supplier Certification Statement, developed by the stormwater programs listed below, can be requested from the Supplier to guarantee that the product meets the specification.

The Certification Statement, a list of soil media suppliers, the BASMAA specification and other materials are available at the following websites:

- Santa Clara Valley Urban Runoff Pollution Prevention Program: www.scvurppp.org/newdev/
- San Mateo Countywide Water Pollution Prevention Program: www.flowstobay.org/preventing-stormwater-pollution/with-new-redevelopment/c-3-regulated-projects/
- Alameda Countywide Clean Water Program: www.cleanwaterprogram.org/businesses/development.html

If a municipality chooses to use the checklist, the following five items are required to be submitted by the soil media Supplier to the requesting municipality or contractor:

- **Sample of the Biotreatment Soil Media**
  A minimum 1-gallon bag of soil media.
- **Attachment A – Supplier Analysis of the Biotreatment Soil Media**
  To be completed by the soil media supplier staff providing the soil media.
- **Attachment B – Lab Analysis of Sand Component of the Biotreatment Soil Media**
  To be completed by the laboratory staff conducting the analysis of the sand.
- **Attachment C – Lab Analysis of Compost Component of the Biotreatment Soil Media**
  To be completed by the laboratory staff conducting the analysis of the compost. Compost analysis of a sample collected (in accordance with the Seal of Testing Assurance [STA] sample collection protocol) shall be completed within the last 120 days. Analysis must be completed by a laboratory enrolled in the US Composting Council's (USCC) Compost Analysis Proficiency (CAP) program, and shall use the Test Methods for the Examination of Composting and Compost (TMECC).
- **Attachment D – Supplier Analysis of Compost Component of the Biotreatment Soil Media**
  To be completed by the compost supplier staff providing the compost component of the soil media.

SAN MATEO COUNTYWIDE Water Pollution Prevention Program

Attachment C
Lab Analysis of Compost Component of Biotreatment Soil Media

The table below shall be completed by the laboratory staff conducting the compost analysis.

Name of Person Filling Out This Form:	**Signature:**
Title:	**Date:**
Phone:	**Email:**
Company:	**City:**
Street Address:	**Zip:**
Qualifications & relevant certifications: (USCC, ASTM or approved equivalent certification)	

Specification	Standard	Testing Results		Pass	Fail
Organic Matter Content	35% - 75% (by dry weight)		%	☐	☐
Carbon-to-Nitrogen Ratio	15:1 to 25:1 (C:N)		C:N	☐	☐
Salinity	< 6.0 mm hos/cm		mm hos/cm	☐	☐
pH	6.5 - 8.2		pH	☐	☐
Bulk Density	500 – 1100 dry lbs / yd^3		dry lbs / yd^3	☐	☐
Moisture Content	30%-55% (of dry solids)		%	☐	☐
Percent inert ingredients (incl. plastic, glass, paper)	< 1% (by weight or volume)		%	☐	☐

Provide the results of at least one of the following analyses to indicate compost stability:

Specification	Standard	Testing Results		Pass	Fail
Oxygen Test	< 1.3 0_2 /unit TS/hr		0_2 /unit TS/hr	☐	☐
Specific Oxygen Test	< 1.5 0_2/unit BVS/hr		0_2/unit BVS/hr	☐	☐
Respiration Test	< 8mg CO_2-C/g OM/day		mgCO_2-C/g OM/day	☐	☐
Dewar test	< 20 ˚C Temp. rise e.		˚C Temp. rise e.	☐	☐
Solvita® Index value	> 5 Index value		Index value	☐	☐

Common Issues

1. ¼ inch sieve on the particle distribution
   - above the 90% limit on the compost fraction
2. pH of the compost
   - above the limit of 8.2 in the compost fraction

Provide the results of at least one of the following analyses to indicate compost toxicity:					
Specification	**Standard**	**Testing Results**		**Pass**	**Fail**
Ratio NH_4^+N: NO_3^--N	< 3		NH_4^+: NO_3^--N	☐	☐
Ammonium	< 500 ppm, dry basis		ppm, dry basis	☐	☐
Seed Germination	> 80% of control		% of control	☐	☐
Plant Trials	> 80% of control		% of control	☐	☐
Solvita® Index value	= 5 Index value		Index value	☐	☐

Provide the analysis of the nutrient content of the compost, including the following:					
Specification	**Standard**	**Testing Results**		**Pass**	**Fail**
Boron (total, in ppm)	< 80 ppm		ppm	☐	☐
Nitrogen (N)(total %)	> 0.9% preferred.		%		
Phosphorus (as P_2O_5)	*[not specified]*		%		
Potassium (as K_2O)	*[not specified]*		%		
Calcium (Ca)	*[not specified]*		%		
Sodium (Na)	*[not specified]*		%		
Magnesium (Mg)	*[not specified]*		%		
Sulfur (S)	*[not specified]*		ppm		

Provide the results of at least one of the following select pathogens:					
Specification	**Standard**	**Testing Results**		**Pass**	**Fail**
Salmonella	< 3 MPN/4 grams TS		MPN/4 grams TS	☐	☐
Coliform Bacteria	< 10,000 MPN/gram		MPN/gram	☐	☐

Does the product meet US EPA, 40CFR 503 regulations regarding trace contaminants metals (Lead, Mercury, etc.)?	☐ Yes (Pass) ☐ No (Fail)

Particle size analysis shall be conducted in accordance with ASTM D 422 (Standard Test Method for Particle Size Analysis of Soils)-washing not required. Equivalent methods acceptable if approved.				
Sieve Size	**Standard Percent Passing (by weight)**	**Testing Results (%)**	**Pass**	**Fail**
1 inch	**99% - 100%**		☐	☐
½ inch	**90% - 100%**		☐	☐
¼ inch	**40% - 90%**		☐	☐
No. 200	**1% - 10%**	**95%**	☐	☐ X

Recommendations for Approving Submittals with These Problems

1. ¼ inch sieve on the particle distribution
   - Recommend approval if in the 90%-100% range because that means that the compost is finer than the spec. Finer compost is better than coarser because it has better water-holding capacity and pollutant removal
2. pH of the compost
   - Recommend approval if under 8.5 since this is the limit Caltrans has for their coarse compost used for erosion and sediment control

Tips for BSM Installation

- BSM should be installed:
  - In two approximately 10” deep lifts (totaling the minimum 18” deep layer required by the MRP after taking 2” of settling into account)
  - Using only boots or water for compaction. Do not use mechanical systems which typically over-compact the BSM and reduce permeability.
- Expect additional settling of 1-2” in the final grade that can be accommodated with mounding, extra mulch, or extra BSM before the plants are installed.

Questions?

Peter Schultze-Allen, CPSWQ
EOA, Inc.
pschultze-allen@eoainc.com

SAN MATEO COUNTYWIDE
Water Pollution
Prevention Program

EOA inc.