

# Biotreatment Soil Mix

## Specification Verification Checklist

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This checklist is intended to supply municipal staff, contractors, designers and others with an easy-to-read summary of the detailed information needed to verify that the biotreatment soil mix being provided by the Soil Mix Supplier meets the BASMAA Regional Biotreatment Soil Specification<sup>1</sup> approved by the Regional Water Board Executive Officer on April 18, 2016<sup>2</sup>.

The checklist should be provided to the Soil Mix Supplier by the municipality or contractor before the soil mix has been ordered to allow for sufficient time to compile the information and time to review the completed checklist before delivery of the soil mix 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 Mix Suppliers, the BASMAA Regional Biotreatment Soil Specification (2016) and other materials are available at the following websites:

- Alameda Countywide Clean Water Program:  
[www.cleanwaterprogram.org/index.php/c3-guidance-table.html](http://www.cleanwaterprogram.org/index.php/c3-guidance-table.html)
- Santa Clara Valley Urban Runoff Pollution Prevention Program:  
[www.scvurppp-w2k.com/nd\\_wp.shtml](http://www.scvurppp-w2k.com/nd_wp.shtml)
- San Mateo Countywide Water Pollution Prevention Program:  
[www.flowstobay.org/newdevelopment](http://www.flowstobay.org/newdevelopment)

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

- **Sample of the Biotreatment Soil Mix**  
A minimum 1-gallon bag of soil mix.
- **Attachment A – Supplier Analysis of the Biotreatment Soil Mix**  
*To be completed by the Soil Mix Supplier providing the soil mix.*
- **Attachment B – Lab Analysis of Sand Component of the Biotreatment Soil Mix**  
*To be completed by the laboratory conducting the analysis of the sand.*
- **Attachment C – Lab Analysis of Compost Component of the Biotreatment Soil Mix**  
*To be completed by the laboratory conducting the analysis of the compost. Compost analysis of a sample collected (in accordance with the 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 Compost Analysis Proficiency program, and shall use the Test Methods for the Evaluation of Composting and Compost (TMECC).*
- **Attachment D – Supplier Analysis of Compost Component of the Biotreatment Soil Mix**  
*To be completed by the Compost Supplier providing the compost component of the soil mix.*

1. [www.basmaa.org](http://www.basmaa.org)

2. [www.swrcb.ca.gov/rwqcb2/water\\_issues/programs/stormwater/mrp.shtml](http://www.swrcb.ca.gov/rwqcb2/water_issues/programs/stormwater/mrp.shtml)

# Attachment A

## Supplier Analysis of Biotreatment Soil Mix

The table below shall be completed by the Biotreatment Soil Mix Supplier.

<b>Date:</b>		<b>Name of Person Filling Out This Form:</b>		
<b>(All lab tests must be done within the last 120 days)</b>				
<b>Title:</b>		<b>Signature:</b>		
<b>Phone:</b>		<b>Email:</b>		
<b>Company Name:</b>		<b>City:</b>		
<b>Street Address:</b>		<b>Zip:</b>		
I certify that the provided Biotreatment Soil Mix meets the requirements of the BASMAA Regional Biotreatment Soil Specification (2016).		<input type="checkbox"/> Yes (Pass)		
		<input type="checkbox"/> No (Fail)		
Describe the equipment and methods used to mix the compost and sand components of the Biotreatment Soil Mix.				
<b>Material</b>	<b>Standard Percent (by volume)</b>	<b>Actual Mix %</b>	<b>Pass</b>	<b>Fail</b>
Sand	60% - 70%		<input type="checkbox"/>	<input type="checkbox"/>
Compost	30% - 40%		<input type="checkbox"/>	<input type="checkbox"/>
Does the soil mix have a permeability of at least 5 inches per hour? <sup>1</sup>			<input type="checkbox"/> Yes (Pass)	
			<input type="checkbox"/> No (Fail)	
Will the soil mix support vigorous plant growth?			<input type="checkbox"/> Yes (Pass)	
			<input type="checkbox"/> No (Fail)	

<sup>1</sup>Soil mix permeability testing is only required for alternative biotreatment soil mixes. Soil permeability tests must be conducted on a minimum of two samples using constant head permeability in accordance with ASTM D2434 with a 6-inch mold and vacuum saturation.

# Attachment B

## Lab Analysis of Sand Component of Biotreatment Soil Mix

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

<b>Name of Person Filling Out This Form:</b>		<b>Signature:</b>		
<b>Title:</b>		<b>Date:</b>		
<b>Phone:</b>		<b>Email:</b>		
<b>Company:</b>		<b>City:</b>		
<b>Street Address:</b>		<b>Zip:</b>		
<b>Qualifications &amp; relevant certifications (ASTM, CTM or approved equivalent certifications):</b>				
Is sand free of wood, waste, coating (such as clay, stone dust, carbonate, etc.), or any other deleterious material?		<input type="checkbox"/> Yes (Pass)		
		<input type="checkbox"/> No (Fail)		
Is all aggregate passing the No. 200 sieve non-plastic?		<input type="checkbox"/> Yes (Pass)		
		<input type="checkbox"/> No (Fail)		
Particle size analysis shall be conducted in accordance with ASTM D 422 (Standard Test Method for Particle Size Analysis of Soils) or CTM 202. Other equivalent methods acceptable only if approved.				
Sieve Size	Standard Percent Passing (% by weight)	Testing Results (%)	Pass	Fail
3/8 inch	100%		<input type="checkbox"/>	<input type="checkbox"/>
No. 4	90% - 100%		<input type="checkbox"/>	<input type="checkbox"/>
No. 8	70% - 100%		<input type="checkbox"/>	<input type="checkbox"/>
No. 16	40% - 95%		<input type="checkbox"/>	<input type="checkbox"/>
No. 30	15% - 70%		<input type="checkbox"/>	<input type="checkbox"/>
No. 40 or 50	5% - 55%		<input type="checkbox"/>	<input type="checkbox"/>
No. 100	0% - 15%		<input type="checkbox"/>	<input type="checkbox"/>
No. 200	0% - 5%		<input type="checkbox"/>	<input type="checkbox"/>

# Attachment C

## Lab Analysis of Compost Component of Biotreatment Soil Mix

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

<b>Name of Person Filling Out This Form:</b>	<b>Signature:</b>
<b>Title:</b>	<b>Date:</b>
<b>Phone:</b>	<b>Email:</b>
<b>Company:</b>	<b>City:</b>
<b>Street Address:</b>	<b>Zip:</b>
<b>Qualifications &amp; relevant certifications: (STA, ASTM or approved equivalent certification)</b>	

Specification	Standard	Testing Results	Pass	Fail
<b>Organic Matter Content</b>	35% - 75% (by dry weight)	%	<input type="checkbox"/>	<input type="checkbox"/>
<b>Carbon-to-Nitrogen Ratio</b>	15:1 to 25:1 (C:N)	C:N	<input type="checkbox"/>	<input type="checkbox"/>
<b>Salinity</b>	< 6.0 mm hos/cm	mm hos/cm	<input type="checkbox"/>	<input type="checkbox"/>
<b>pH</b>	6.2 - 8.2	pH	<input type="checkbox"/>	<input type="checkbox"/>
<b>Bulk Density</b>	500 – 1100 dry lbs / yd <sup>3</sup>	dry lbs / yd <sup>3</sup>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Moisture Content</b>	30%-55% (of dry solids)	%	<input type="checkbox"/>	<input type="checkbox"/>
<b>Percent inert ingredients (incl. plastic, glass, paper)</b>	< 1% (by weight or volume)	%	<input type="checkbox"/>	<input type="checkbox"/>

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

Specification	Standard	Testing Results	Pass	Fail
<b>Oxygen Test</b>	< 1.3 O <sub>2</sub> /unit TS/hr	O <sub>2</sub> /unit TS/hr	<input type="checkbox"/>	<input type="checkbox"/>
<b>Specific Oxygen Test</b>	< 1.5 O <sub>2</sub> /unit BVS/hr	O <sub>2</sub> /unit BVS/hr	<input type="checkbox"/>	<input type="checkbox"/>
<b>Respiration Test</b>	< 8mg CO <sub>2</sub> -C/g OM/day	mgCO <sub>2</sub> -C/g OM/day	<input type="checkbox"/>	<input type="checkbox"/>
<b>Dewar test</b>	< 20 °C Temp. rise e.	°C Temp. rise e.	<input type="checkbox"/>	<input type="checkbox"/>
<b>Solvita® Index value</b>	> 5 Index value	Index value	<input type="checkbox"/>	<input type="checkbox"/>

Provide the results of <u>at least one</u> of the following analyses to indicate compost toxicity:					
Specification	Standard	Testing Results		Pass	Fail
Ratio NH <sub>4</sub> <sup>+</sup> -N: NO <sub>3</sub> <sup>-</sup> -N	< 3		NH <sub>4</sub> <sup>+</sup> -N : NO <sub>3</sub> <sup>-</sup> -N	<input type="checkbox"/>	<input type="checkbox"/>
Ammonium	< 500 ppm, dry basis		ppm, dry basis	<input type="checkbox"/>	<input type="checkbox"/>
Seed Germination	> 80% of control		% of control	<input type="checkbox"/>	<input type="checkbox"/>
Plant Trials	> 80% of control		% of control	<input type="checkbox"/>	<input type="checkbox"/>
Solvita® Index value	= 5 Index value		Index value	<input type="checkbox"/>	<input type="checkbox"/>
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	<input type="checkbox"/>	<input type="checkbox"/>
Nitrogen (N)(total %)	> 0.9% preferred.		%	<input type="checkbox"/>	<input type="checkbox"/>
Phosphorus (as P <sub>2</sub> O <sub>5</sub> )	<i>[not specified]</i>		%		
Potassium (as K <sub>2</sub> O)	<i>[not specified]</i>		%		
Calcium (Ca)	<i>[not specified]</i>		%		
Sodium (Na)	<i>[not specified]</i>		%		
Magnesium (Mg)	<i>[not specified]</i>		%		
Sulfur (S)	<i>[not specified]</i>		ppm		
Provide the results of <u>at least one</u> of the following select pathogens:					
Specification	Standard	Testing Results		Pass	Fail
Salmonella	< 3 MPN/4 grams TS		MPN/4 grams TS	<input type="checkbox"/>	<input type="checkbox"/>
Coliform Bacteria	< 10,000 MPN/gram		MPN/gram	<input type="checkbox"/>	<input type="checkbox"/>
Does the product meet US EPA, 40CFR 503 regulations regarding trace contaminants metals (Lead, Mercury, etc.)?				<input type="checkbox"/> Yes (Pass) <input type="checkbox"/> 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%			<input type="checkbox"/>	<input type="checkbox"/>
½ inch	90% - 100%			<input type="checkbox"/>	<input type="checkbox"/>
¼ inch	40% - 90%			<input type="checkbox"/>	<input type="checkbox"/>
No. 200	1% - 10%			<input type="checkbox"/>	<input type="checkbox"/>

# Attachment D

## Supplier Analysis of Compost Component of Biotreatment Soil Mix

*The table below shall be completed by the Compost Supplier providing the compost for the mix.*

<b>Name of Company:</b>	<b>Date of Delivery:</b>
<b>Qualifications &amp; relevant certifications:</b> (STA, ASTM or approved equivalent certifications)	<b>Date of the Compost Lab Analysis Report:</b> (Must be dated within 120 days prior to delivery)
<b>Name of Person Filling Out This Form:</b>	<b>Date:</b>
<b>Signature:</b>	<b>Street Address:</b>
<b>Email address:</b>	<b>City:</b>
<b>Phone:</b>	<b>Zip:</b>
Feedstock materials have been specified and include only the following: Landscape/yard trimmings, grass clippings, food scraps, or agricultural crop residues?	<input type="checkbox"/> Yes (Pass)
	<input type="checkbox"/> No (Fail)
Compost has a dark brown color and a soil-like odor, does not exhibit a sour or putrid smell, does not contain recognizable grass or leaves, and is not hot (120°F) upon delivery or rewetting?	<input type="checkbox"/> Yes (Pass)
	<input type="checkbox"/> No (Fail)
The compost has gone through the process to further reduce pathogens (PFRP)? For example, turned windrows must reach a minimum temperature of 55°C for 15 days with at least 5 turnings during that period.	<input type="checkbox"/> Yes (Pass)
	<input type="checkbox"/> No (Fail)