The Last Mile: Logistics and Challenges In Delivering & Applying Compost BMP's

- **Craig Kolodge Ph.D.**
- **San Pasqual Valley Soils/ ACP**

SB 1383 – In a Nutshell

The California State Legislature passed Senate Bill 1383 (SB 1383) in 2016 which requires (i.e. mandates) cities and counties to reduce organic waste disposal and divert it from landfills by 75% by 2025 to decrease methane production and help reach the state's ambitious Climate Goals.

Solving the Puzzle of “SB1383 Last Mile” Logistics

The Last Mile of Recycled Organics

Defining our Terms: Diversion

- **“The act or instance of diverting or straying from a course, activity, or use.”**

Merriam-Webster Dictionary

A Major Paradigm Shift: From Waste to a Value-added Bioresource

The Diversion and Re-purposing of Recycled Landscape and Food Waste from our Landfills Towards Beneficial Ecosystem Land Application Has Massive Implications and Requires Sophisticated and Well-Designed Logistics.


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Defining our Terms: Logistics

- **“The detailed coordination of a complex operation involving many people, facilities or supplies.”**
- **“The commercial activity of transporting goods to customers.”**

Merriam-Webster Dictionary

What Questions are We Not Asking About Compost BMP's?

Who is responsible for the logistics of determining how re-purposed and diverted organics will be delivered and applied to deliver environmental services to help meet the SB1383 procurement targets for each jurisdiction?

What Are Procurement Targets and Why Do They Matter?

SB1383 Jurisdiction Procurement Targets Based on January 1, 2021 Population Estimates: The requirement indicates the annual recovered organic waste product procurement targets for each jurisdiction (city, county, or city and county) in California that went into effect January 1, 2022 and has various timelines specific to each jurisdiction.

What Are Procurement Targets and Why Do They Matter?

Local jurisdictions determine every 5 yrs their local per capita procurement target using information from a local waste characterization study.

This data is organized alphabetically by county and includes all cities within the county and the unincorporated county.

Purpose of Procurement Targets

The intent of the procurement requirements is to drive demand for the use of diverted and recycled organic waste products for purposes such as storm water management, where their benefits are realized.

Purpose of Procurement Targets

Diverted "recovered organic waste products" do not have to be obtained solely through purchasing. A jurisdiction or its direct service provider may acquire products in another way (e.g., internal production, free delivery or free distribution from a hauler or other entity via an agreement)

Definition of a Recovered Organic Waste Product

- **“recovered organic waste products” [14 CCR Section 18982(a)(60)]:**
- **"Recovered organic waste products" means products made from California, landfill-diverted recovered organic waste processed at a permitted or otherwise authorized operation or facility.”**

Compost & Mulch Procurement Strategy

Compost and Mulch Procurement Strategies from Alameda County - CalRecycle Procurement Web Site

- **"How Much Compost and Mulch Can We Use?"**
- **Mapping the county's capacity on where and how to use these recycleable products**

Example of Compost Procurement Target for City of Escondido, CA

- Escondido Total Population: 151,688 (2021)
- Annual Procurement Target: 12,135 Tons/yr
- Compost Conversion - 1 Ton x 1.45 = Cubic Yds/yr
- # of Cubic Yds/yr = 17, 595 yds3
- # of Cubic Yards/Truckload = 30 yds3
- # of Truckloads to meet target = 587 truckloads

Cost per Truckload to Deliver Compost in San Diego county

- **Ranges from $75 - $450/truckload depending on location from compost facility**
- **Avg. cost per truckload = $250 x 587 loads = $146,750**

Cost per Blower Truck to Deliver & Apply Compost in San Diego county

- **Ranges from $1000 - $1200/blower truckload (30-60 cubic yds/load)**
- **Avg. cost per truckload = $1200 x 293 loads = $351,600**

Procurement Strategies Must Include the Cost and Logistics Associated with the Last Mile

What if you don't have the budget to hire a blower truck service to deliver and apply your compost?

What is the labor cost of manually applying compost using buckets and rakes? Worker's Comp. liability insurance?

AB 2346: Organic waste reduction regulations: Additional Ways for Jurisdictions to Meet SB 1383 Diversion and Procurement Goals – 2024

Local jurisdictions may count the following direct expenditures towards its recovered organic waste product target until Dec. 31, 2035. Includes:

"Equipment that is used to apply compost or mulch."

AB 2346: Organic waste reduction regulations: Additional Ways for Jurisdictions to Meet SB 1383 Diversion and Procurement Goals – 2024

"Equipment that is used to apply compost or mulch." Limited to the Following:

Compost Spreaders
Drag Harrows
Chippers
Stump Grinders
Blowers, including attachments to blowers

AB 2346: Organic waste reduction regulations: Additional Ways for Jurisdictions to Meet SB 1383 Diversion and Procurement Goals – 2024

Equipment can be purchased by a jurisdiction, if it chooses to, and provided to other entities such as farms and ranches located in the jurisdiction.

Development of compost and mulch distribution sites is encouraged to make free compost and mulch accessible and available to residents.

AB 2346: Organic waste reduction regulations: Additional Ways for Jurisdictions to Meet SB 1383 Diversion and Procurement Goals – 2024

Equipment purchase by a jurisdiction, e.g. City of Escondido could apply $45,832 in compost procurement costs towards the purchase of a bark blower unit under AB2346

Procurement Strategies Must Include the Cost and Logistics Associated with the Last Mile

What service providers and application equipment are currently available in your area for applying compost to municipal landscapes?

How long would it take to acquire equipment if you purchased it for your own use? Typically 12 month or longer

Procurement Strategies Must Include the Cost and Logistics Associated with the Last Mile

Urban vs. Rural Agricultural regions of the state have very different challenges and access to resources to support complying with the Procurement Requirements of SB 1383

Procurement Strategies Must Include the Cost and Logistics Associated with the Last Mile

The biggest challenge of meeting Procurement Goals of SB1383 rest on the shoulders of large, urban populations throughout the state that have few farms to absorb the annual flow of recycled organics that need to be diverted

Procurement Strategies Must Include the Cost and Logistics Associated with the Last Mile

The closer your recycled organics processing facility are to commercial working farms, the easier and lower the cost of delivering and spreading of large quantities of organics

Procurement Strategies Must Include the Cost and Logistics Associated with the Last Mile

If you purchase or rent equipment to apply compost and mulch to your land, who will operate and maintain the equipment?

What loading equipment do you need to provide to fill the application equipment and how will it be transported to the site?

Procurement Strategies Must Include the Cost and Logistics Associated with the Last Mile

Washington State University Compost Outreach Project: While there are over five commercial composting operations in Snohomish County, there is limited rental equipment or compost spreading services available. In a June 2014 survey, 19 farmers supported the idea of compost producers providing compost spreading services or equipment. Several farmers have expressed an interest in hiring spreading services, and renting or sharing equipment.

Procurement Strategies Must Include the Cost and Logistics Associated with the Last Mile

The Resource Conservation District (RCD) of the Greater San Diego region is currently exploring a program of providing spreading equipment to farmers to help defray the cost of applying compost and mulch to local orchards and farmland to support Carbon Farming Practices – It's a work in progress

Procurement Strategies Must Include the Cost and Logistics Associated with the Last Mile

Closing Remarks: Closing the loop on the beneficial diversion of recycled organics will require first recognizing the challenges inherent in supporting the last mile, and then finding available statewide and local funding to develop successful strategies to provide the financial resources and equipment to meet the challenges. "Show Me the Money!"

Contact Information

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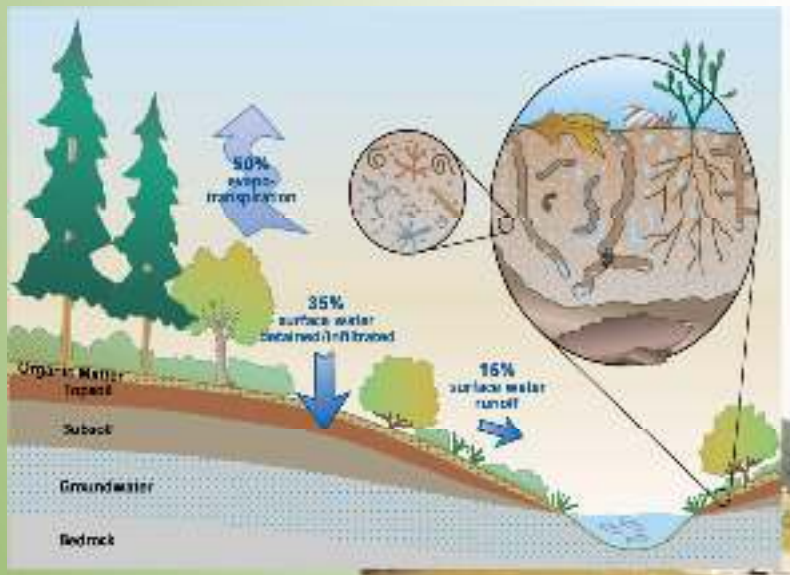
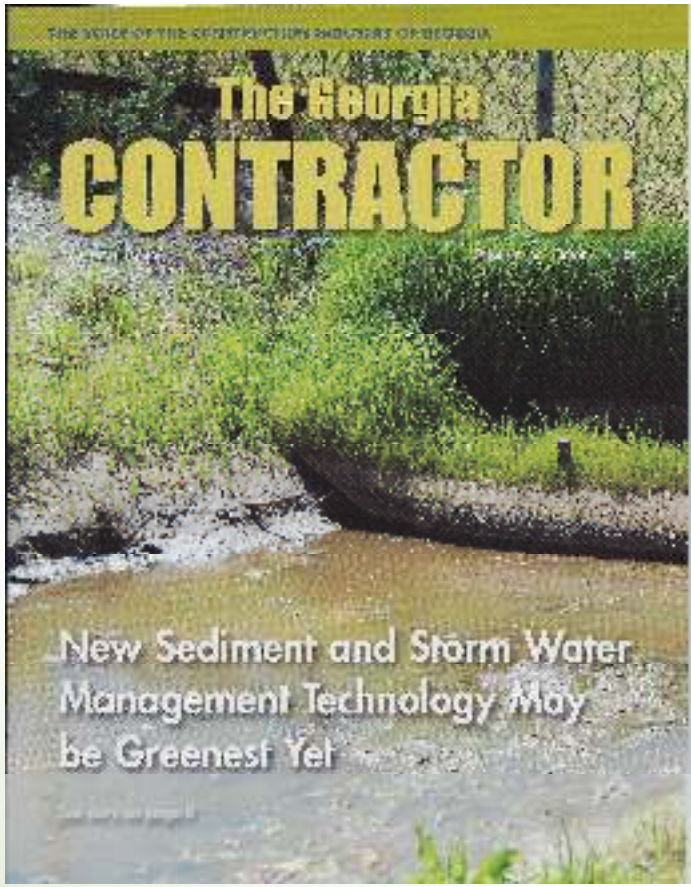
Runoff + Erosion Control



Compost - The Green BMP

- 100% Recycled
- Bio-based, organic materials
- Locally manufactured
- Reduces Carbon Footprint
- Uses Natural Principles
- Benign to *Restorative*
- High Performance



Compost Tools

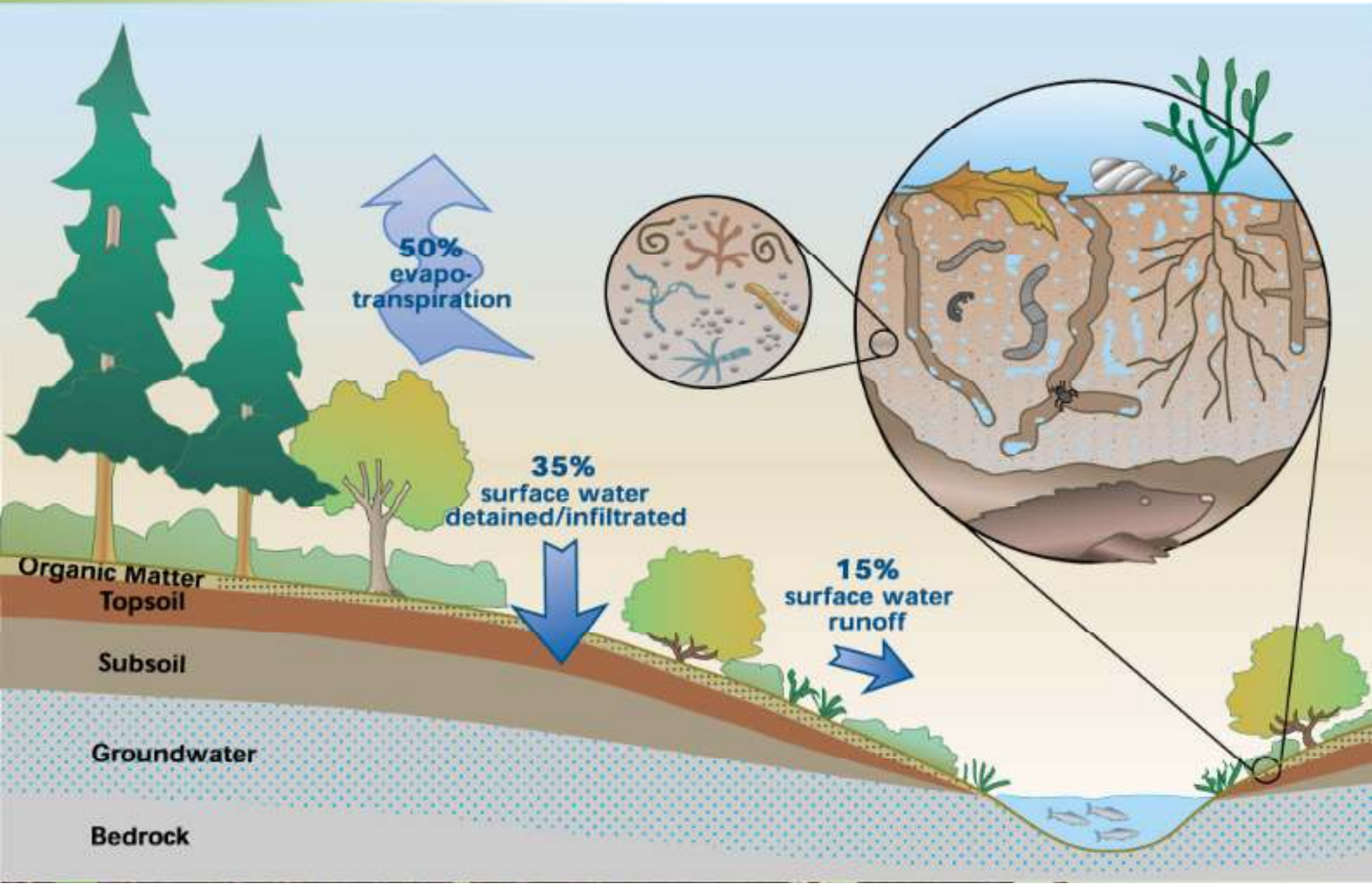
Filter Media

- Designed for Optimum Filtration & Hydraulic-flow

Growing Media

- Designed for Optimum Water Absorption & Plant Growth

Natural Stormwater Management



USEPA Compost Blanket Specifications

Parameters	Units of Measure	Surface to be Vegetated	Surface to be left Unvegetated
pH	pH units	5.0 – 8.5	N/A
Soluble salt concentration (electrical conductivity)	dS/m (mmhos/cm)	Maximum 5	Maximum 5
Moisture content	%, wet weight basis	30 – 60	30 – 60
Organic matter content	%, dry weight basis	25 – 65	25 – 100
Particle Size Distribution	% passing a selected mesh size, dry weight basis	- 3 in. (75 mm), 100% passing - 1 in. (25 mm), 90 – 100% passing - ¾ in. (19 mm), 65 – 100% passing - ¼ in. (6.4 mm), 0 – 75% passing Maximum particle length of 6 in (152 mm)	- 3 in. (75 mm), 100% passing - 1 in. (25 mm), 90 – 100% passing - ¾ in. (19 mm), 65 –100% passing - ¼ in. (6.4 mm), 0 – 75% passing Maximum particle length of 6 in (152 mm)
Stability Carbon dioxide evolution rate	mg CO_2–C per g organic matter per day	<8	N/A
Physical contaminants (manmade inerts)	%, dry weight basis	<1	<1

Stormwater BMPs

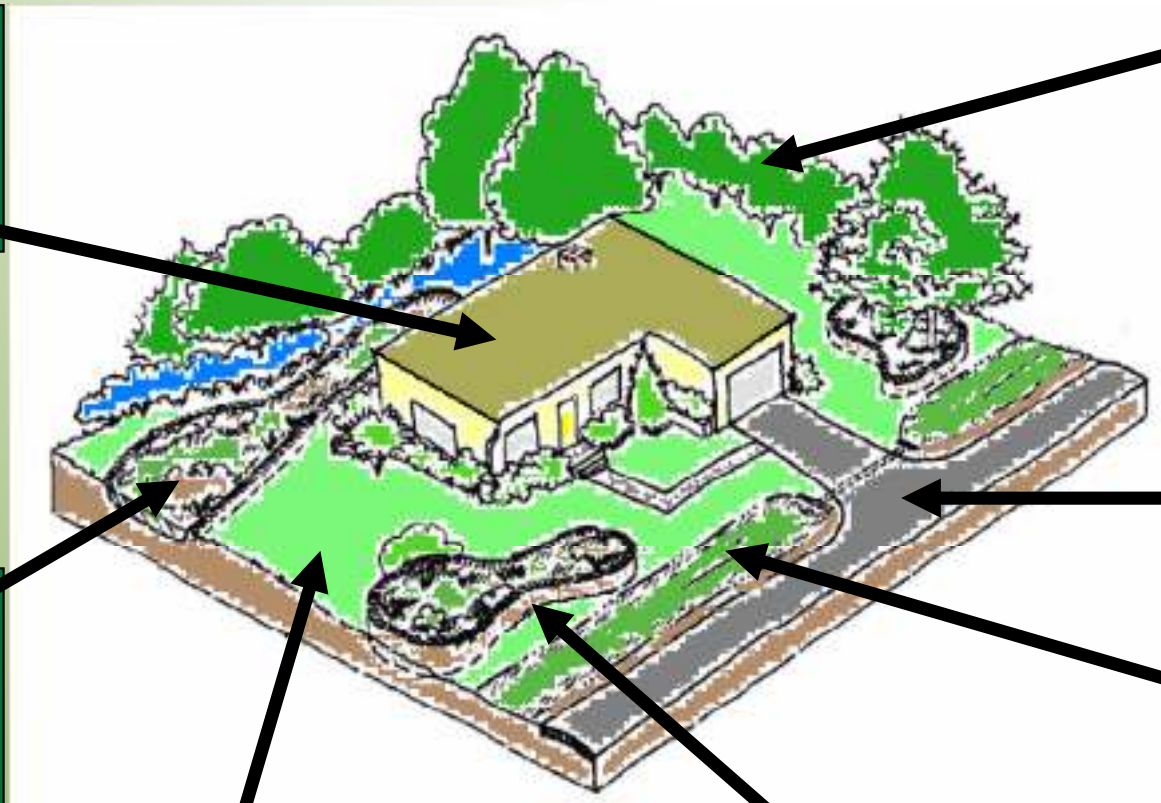
Erosion & Sediment Control

1. Perimeter Control
2. Inlet Protection
3. Ditch Check
4. Filter Ring/Concrete washout
5. Slope Interruption
6. Runoff Diversion
7. Vegetated Cover
8. Erosion Control Blanket
9. Vegetated Sediment Trap
10. Pond Riser Pipe Filter
11. Dune Restoration
12. Stream Restoration
13. Living Shorelines

Low Impact Development

11. Runoff Control Blanket
12. Vegetated Filter Strip
13. Engineered Soil
14. Channel Liner
15. Streambank Stabilization
16. Biofiltration System
17. Bioretention System
18. Green Roof System
19. Living Wall
20. Green Retaining Wall
21. Vegetated Rip Rap
22. Level Spreader
23. Green Gabion
24. Bioswale

A Sustainable Site



Green Roof

Native Vegetation

Green Pavers

Rain Garden/ Bioretention

Bioswale

Stormwater Blanket

Engineered Soil

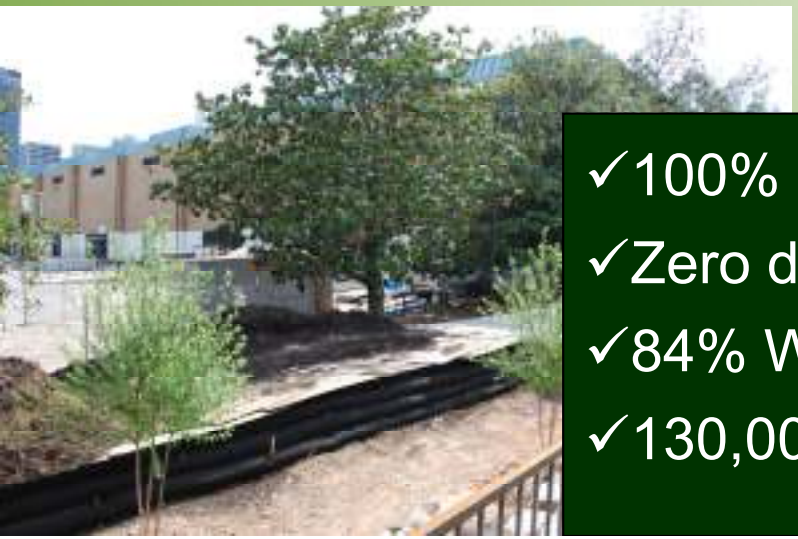
Southface

Responsible Solutions for Environmental Living

Eco Office

Grand Opening

August 18, 2009



- ✓100% rain/stormwater capture
- ✓Zero discharge
- ✓84% Water Savings
- ✓130,000 gal/yr

Southface

Responsible Solutions for Environmental Living

Pollutant Load Reduction:

Compost Blanket vs Conventional Seeding

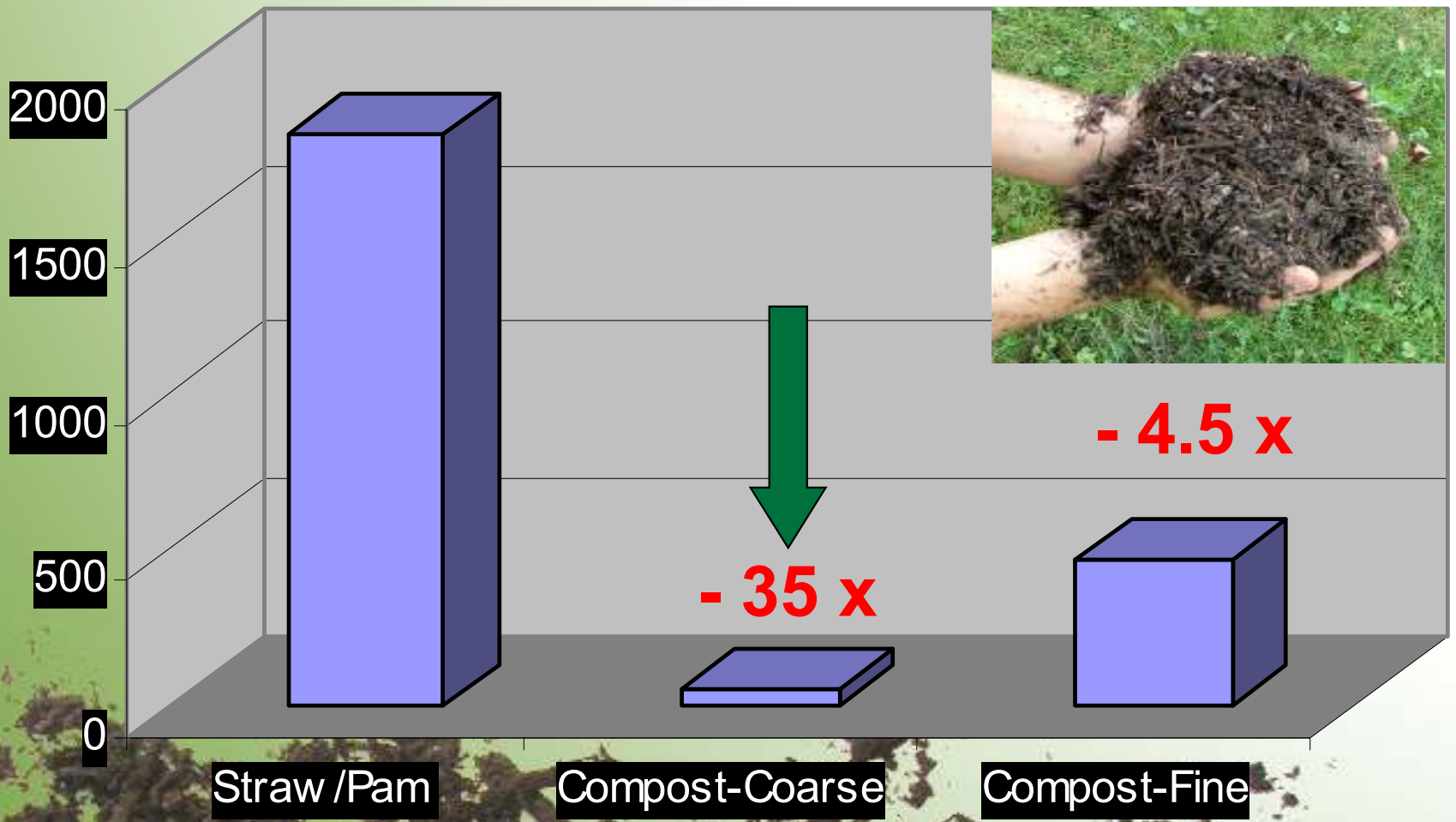
	Total N	Nitrate N	Total P	Soluble P	Total Sediment
Mukhtar et al, 2004 (seed+fertilizer)	88%	45%	87%	87%	99%
Faucette et al, 2007 (seed+fertilizer)	92%	ND	ND	97%	94%
Faucette et al, 2005 (hydromulch)	58%	98%	83%	83%	80%
Persyn et al 2004 (seed+topsoil)	99%	ND	99%	99%	96%

Stormwater Pollutant Removal

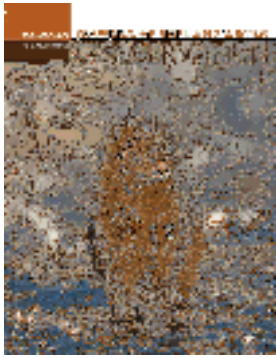
	TSS	Turbidity	Total N	NH_4-N	NO_3-N	Total P	Sol. P	Total coli.	E. coli.	Metals	Oil	Diesel
Filter Sock	80 %	63%	35 %	35%	25 %	60 %	92%	98%	98%	37-78%	99 %	99%

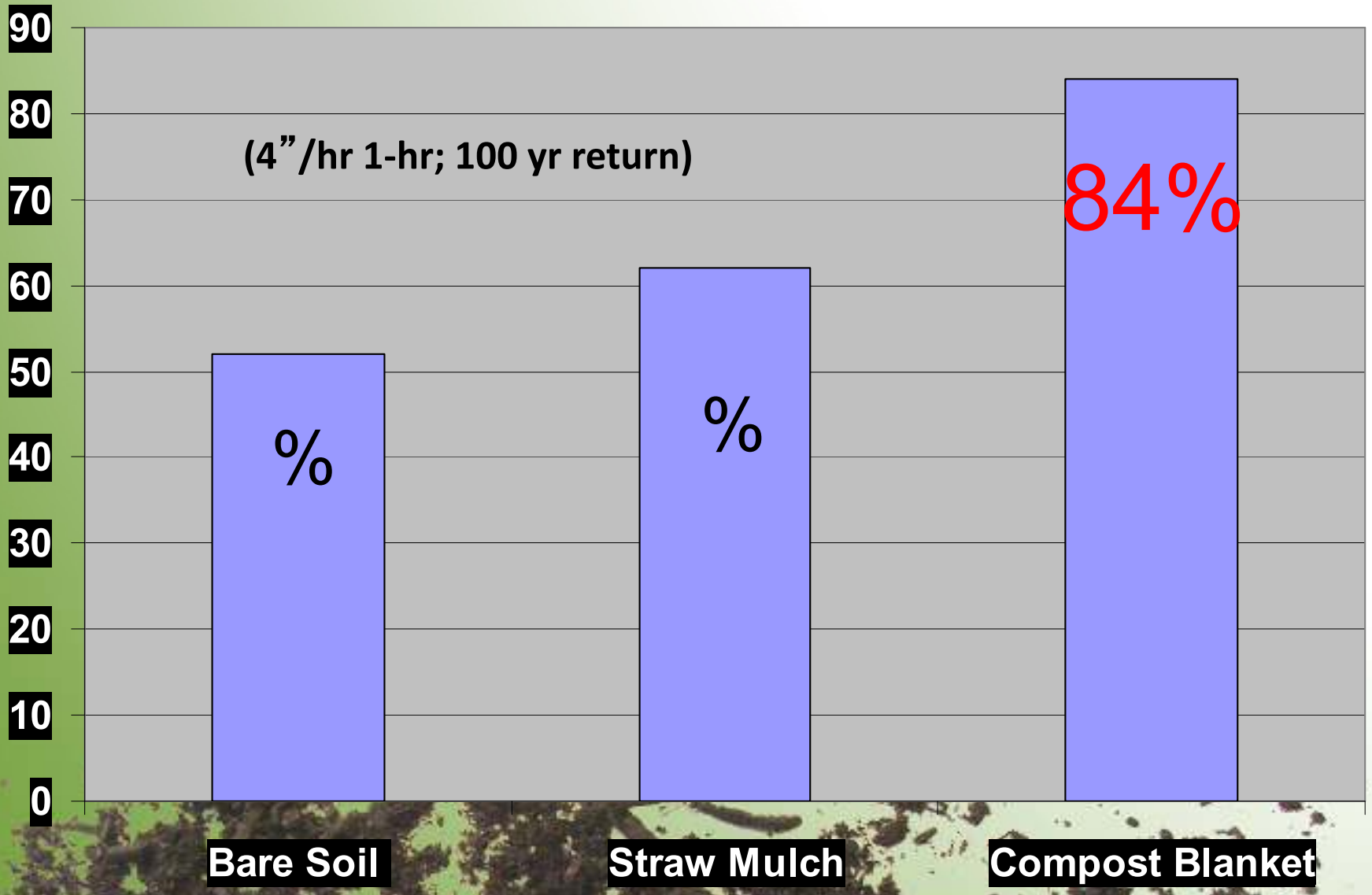
Turbidity (NTU)

Average from 4-inch Storm Event



LID: Rainfall Absorption





Assessing Environmental Impact.

LivingWall Environmental Impact

Project Profile

Project Details

The homeowners of a historic lakefront property had slope stability concerns as well as a desire to access the sandy beach at the water's edge. From the view from the back porch windows, the home was right at the edge of the slope. The project site is located on a 115 foot 2:1 bluff overlooking Lake Michigan. It was determined by the geotechnical engineer that the site required stabilization.

Marek Landscaping, LLC, based in Milwaukee, WI, designed and implemented the project, selecting a Filtrexx GreenLine living wall for the upper portion of the bluff. This would stabilize the area directly adjacent to the home, adding eight feet of yard to the upper terrace. The living wall would be the foundation from which the deck and stairs would be anchored, providing access to the beach and a sweeping view of the coast. A low impact trail created a rustic but navigable route to the base of the slope.

This low impact solution promotes the growth of native plants for both a natural aesthetic as well as stabilization properties.

Wisconsin Lakefront Bluff Stabilization

Shorewood, Wisconsin

This environmental impact statement is for a **1,500** facial square foot wall on a lakefront repair project in Wisconsin. The project utilizes **2,000** linear feet of Filtrexx® 12" GroSox® filled with Filtrexx Certified℠ GrowingMedia™.

- **320,000 lbs.** of Organics Diverted from Landfills
- **8,000 gallons** of Potential Rainfall Absorption
- **560,000 lbs.** of CO_2e Methane Avoidance
- **75 lbs.** of CO_2 Sequestered in Vegetation
- **54,000 lbs.** of CO_2 Sequestered in Soil

The calculated numbers are based off of Filtrexx TechLink Research Summary #3335, Ecosystem Service Benefits of Filtrexx Compost Based Sustainable Management Practices (SMPs).

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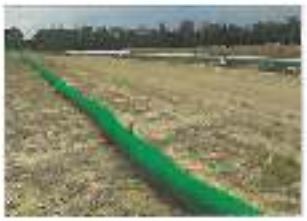
EcoPRACTICES®

Recognizing Responsibility

We're looking for sustainability leaders.

- Many companies have sustainability goals they strive to reach— EcoPractices is a third party verification company that helps to market your sustainability practices by providing proof practices were implemented and produced scientifically proven environmental benefits.
- EcoPractices helps connect like minds, reach, and realize sustainability goals with a variety of services and product solutions.
- EcoPractices identifies, collects, verifies, accounts for, and generates positive environmental impacts produced from simply implementing **Sustainable Best Management Practices (SBMPs)** on your projects.



Make your BMP an SBMP.

- Project owners, municipalities, and power & utility industries commonly use conventional BMPs that are cost intensive and low-performing.
- EcoPractices is proud to work with Filtrexx®, a trailblazer in the industry with nation-wide-compliant **SBMP** solutions supported by private research, public university research, and government agencies.
- EcoPractices is committed to offering a library of SBMPs from Filtrexx that not only comply with project permits, but are proven to outperform conventional, unsustainable products.

What is an Ecotag™?

- Ecotags are a metric generated from an environmental impact assessment and represent the positive environmental benefits of their sustainable practices.
- Ecotags offer companies the unique opportunity to support conservation practices that have verified beneficial impacts on the environment.
- In 2015, 66% of people reported willingness to pay more for a product from a company that committed to environmental responsibility (Source: Nielsen).
- Utilize Ecotags in your Corporate Social Responsibility Reports and to communicate your sustainability story and goals.

5280 CERTIFIED COTTAGE

WHAT DOES THIS OFFSET? —

15 CARS OFF THE ROAD/YEAR

- AND -

1 Ecotag = 1 lb of Soil implemented

Contact us for a complimentary discovery meeting to find out how EcoPractices can assist with reaching your sustainability goals & telling your story.

[illegible] Grand Ave, West Des Moines, IA 50266 | 515-446-8723 | info@ecopractices.com | EcoPractices.com

The Sustainable Site

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*"....*an essential tool for engineers, designers, architects, regulators, planners, managers, contractors, consultants, policymakers, builders, and water resource managers." – *Forester Press*