



**ENVIRONMENTAL
PRODUCTS, LLC™**

www.LSCenv.com

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LSC California Team



Vincent Randolph
Regional Sales Manager



LSC Family of Products



Background of Polyacrylamides (PAM)

- ▶ Polyacrylamides (PAM) large linear-chain polymer
- ▶ Anionic PAM has a negative charge and can be used in erosion control BMP and Passive Treatment applications under Construction General Permit (CGP)
- ▶ Cationic PAM has a positive charge and can not be used in erosion control BMP and Passive Treatment. Is used in active treatment processes.
- ▶ Anionic PAM is biodegradable
- ▶ Commonly used in furrow farming irrigation agriculture, food processing, and drinking water treatment due to its low toxicity

Anionic PAM in Erosion Control Applications



- ▶ Decreases soil detachment
- ▶ Maintains soil structure and preserves pore space
 - ▶ Allows for water infiltration
 - ▶ Allows Microbes to breathe
 - ▶ Anionic PAM will not create a crust
- ▶ Flocculates suspended sediment
- ▶ Activated by water, performance improved by agitation



USDA Approved/EPA Recommended

This is your irrigated furrow.

This is your furrow on PAM!

The image shows a side-by-side comparison of furrows. The left furrow is filled with muddy water, while the right furrow is filled with clear water. In the center, two sediment traps are shown, with the left one containing a large amount of sediment and the right one containing very little. The USDA logo is in the bottom left, and the EarthGuard logo is in the bottom right.

USDA

Northwest Irrigation and Soils Research Laboratory, Kimberly, Idaho

The EarthGuard logo is a green globe with a grid pattern and the word "EARTHGUARD" in black capital letters below it.



Construction General – Erosion Control BMP

- ▶ EarthGuard® products will be considered erosion control BMPs in the new California construction general permit. These sprayed on applications are applied to soils for erosion and sediment control.
- ▶ Passive application is used to reduce turbidity in discharges. EarthGuard® treats soil while passive treatment solutions treat unclean water.

ORDER WQ 2022-0057-DWQ
NPDES No. CAS000002

II.D. Erosion Control

II.D.1. Dischargers shall implement the following practices to eliminate or minimize site erosion. Erosion control BMPs (except for sprayed products) shall be available on-site or at a nearby location (e.g., common lay-down yard), year-round with trained persons able to deploy the product under the direction of the Qualified SWPPP Practitioner:

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discharger shall consider the use of plastic materials resistant to solar degradation;

- I. Control stormwater and non-stormwater discharges to minimize downstream channel and bank erosion; and
- m. Control peak flowrates and total volume of stormwater and authorized non-stormwater discharges to minimize channel and streambank erosion and scour in the immediate vicinity of discharge points.

II.D.2. Dischargers that stabilize soil using bonded-fiber matrices, hydromulches, spray tackifiers, or other land-applied products shall:

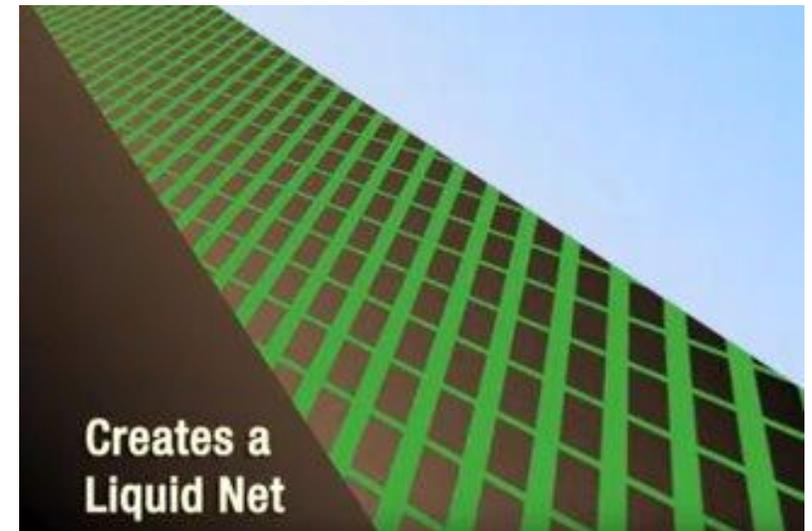
- a. Apply the product according to the manufacturer's instructions and guidance; and
- b. Apply the product according to the manufacturer's guidance to allow for ample cure time and to prevent treatment chemicals from being transported by runoff.





How EarthGuard® Works

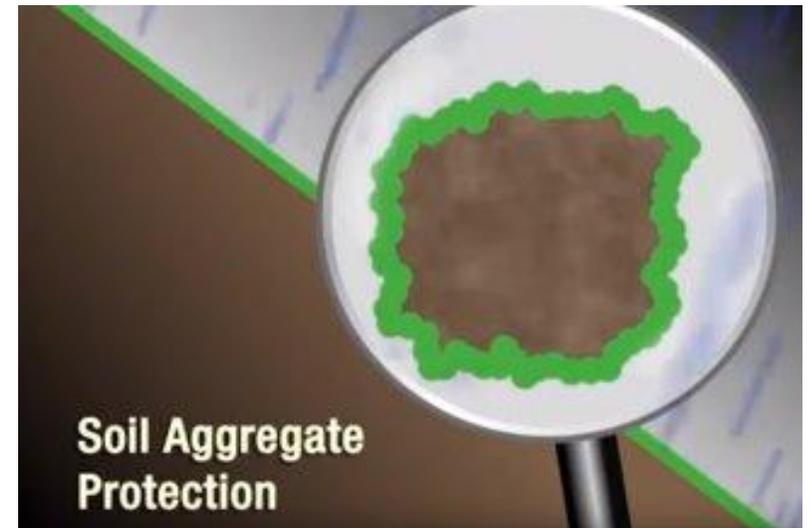
1. Creates a liquid net
 - ▶ EarthGuard® molecules attach to soil particles & create an invisible net that stabilizes the soil



How EarthGuard® Works

2. Soil Aggregate Protection

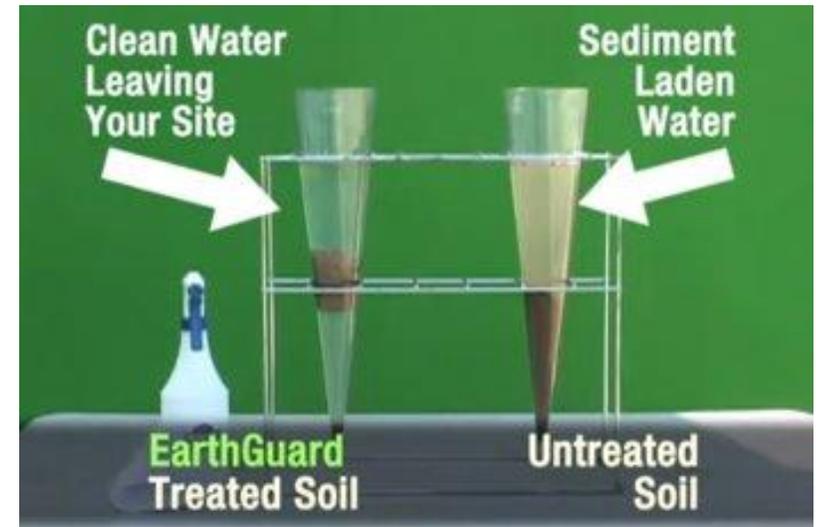
- ▶ EarthGuard® engulfs soil particles & keeps them whole



How EarthGuard® Works

3. Flocculates Suspended Sediments

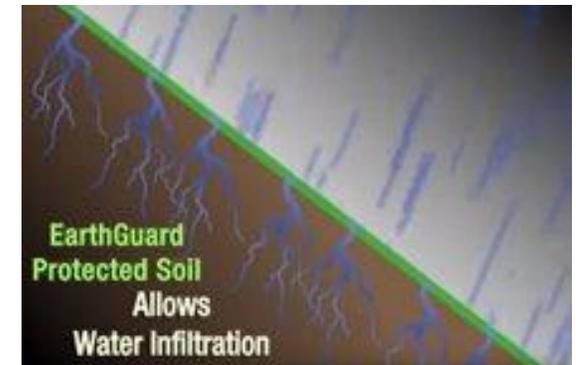
- ▶ Soil particles flocculate and drop, allowing clean water to leave the site



How EarthGuard® Works

4. Controls Splash Erosion

- ▶ When applied with mulch (like Edge™ or EarthGuard® Fiber Matrix™) the combination creates a buffer to prevent splash erosion



Product Overview

The LSC logo is a stylized green leaf shape with the letters 'LSC' in white inside.

Liquid			Maximum formulation flexibility
Pellets			Maximum application flexibility
Fiber Mulch			Maximum durability

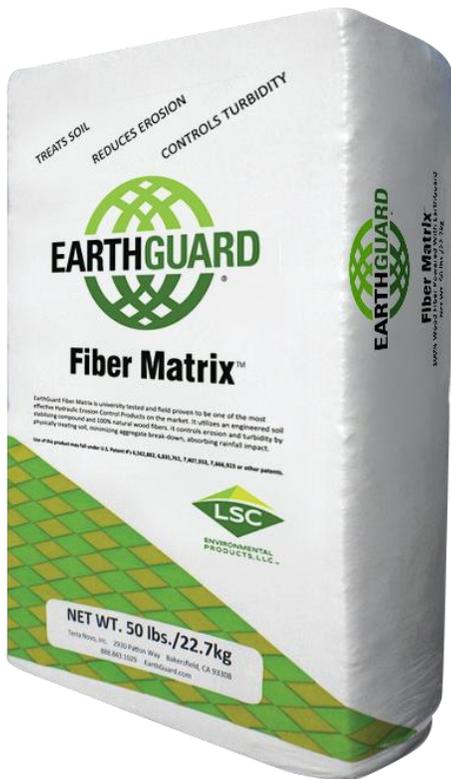
General uses and application

- Re-vegetation
- Erosion Control
- Slope stabilization
- Turbidity and total suspended solids (TSS) control
- Site winterization
- Post-Fire ash containment and re-vegetation





Product Overview





EarthGuard® Liquid

Application Methods	Uses	Benefits	Packaging
<ul style="list-style-type: none">• Water Truck• Jet agitated hydroseeder• Standard hydroseeder	<ul style="list-style-type: none">• Mix onsite with any hydro-mulch to improve durability• Direct application for Turbidity and TSS control... Perfect for instantaneous site stabilization• Temporary slope or site stabilization	<ul style="list-style-type: none">• Maximum formulation flexibility• Dramatically improves any mulch performance• Easy to inventory• Easy to use	<ul style="list-style-type: none">• 5 Gallon Containers• 32 Containers / Pallet• Minimum order quantity: 5 Gallon Container



**Turbidity & TSS Control:
EarthGuard® Rain Event Action Plan**



**Re-vegetation / Erosion Control / Slope Stabilization:
EarthGuard® Liquid + your choice of Mulch**



Temporary Erosion Control: Storm by Storm



Temporary Erosion and Dust Control – Up to 4" of Rain

Slope	EarthGuard®	Water (gal/ac)*
≤ 4:1	3 gal/ac	As required to properly cover 1 acre of area: <ul style="list-style-type: none"> • Spray Rig ≥ 1500 gal/ac • Water Truck ≥ 2000 gal/ac
3:1	4 gal/ac	
2:1	5 gal/ac	
1.5:1	6 gal/ac	
1:1	8 gal/ac	
Stockpiles	10 gal/ac	

Site Winterization: Flat Pads/Backyard Stabilization



Time	EarthGuard [®] †	Water (gal/ac)*
1-2 months	3-5 gal/ac	As required to properly cover 1 acre of area: <ul style="list-style-type: none">• Spray Rig ≥ 1500 gal/ac• Water Truck ≥ 2000 gal/ac
2-3 months	5-8 gal/ac	
3-6 months	8-10 gal/ac	
6-12 months	10-15 gal/ac	



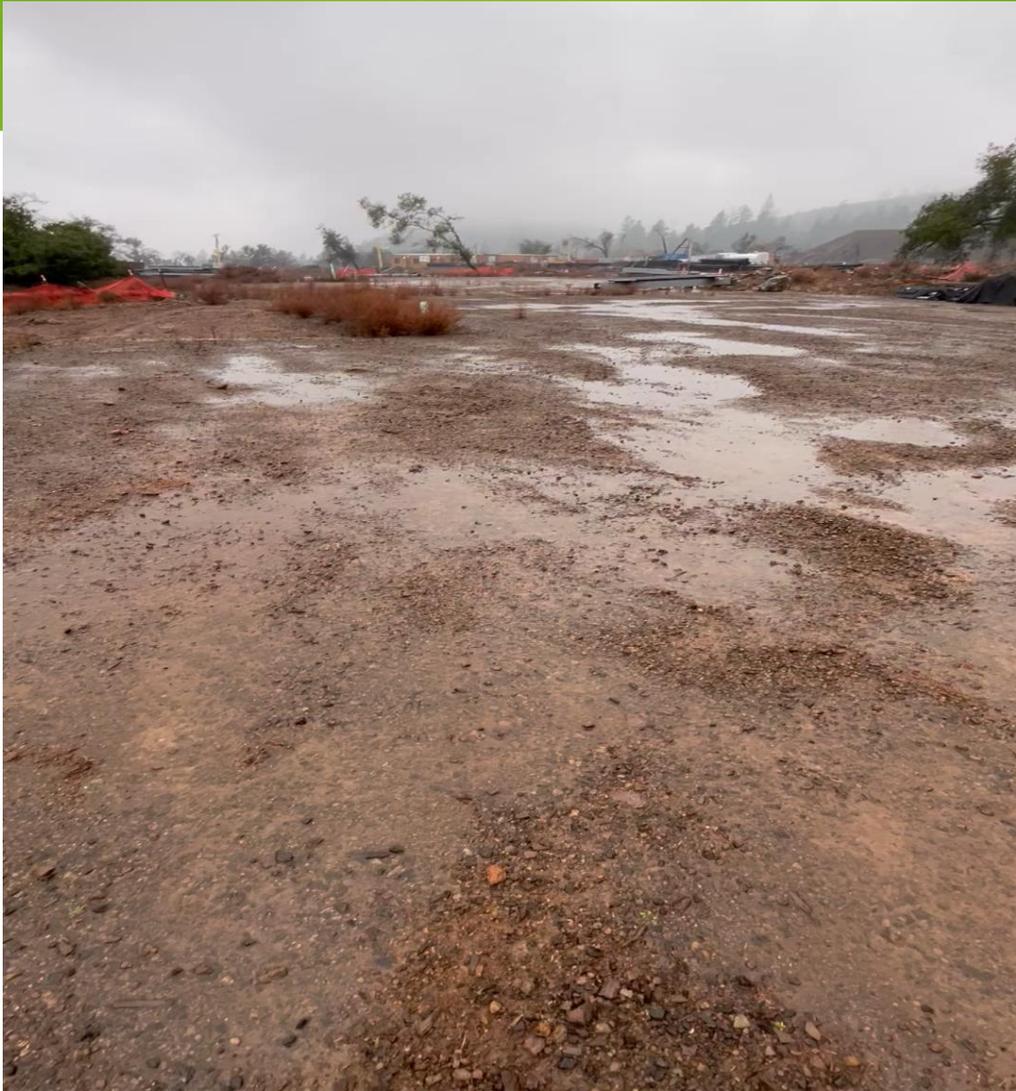
Storm by Storm Application





Extended Coverage Application







Sediment Control

- ▶ EarthGuard® Soil Stabilizer
 - ▶ Mixes with water and apply to construction sites
 - ▶ Reduces turbidity
 - ▶ Keeps runoff water clean!



Treated



Not Treated



BMP Roundup





EarthGuard® Fiber Matrix

Application Methods	Uses	Benefits	Packaging
<ul style="list-style-type: none">• Standard paddle mix hydroseeder	<ul style="list-style-type: none">• Re-vegetation• Erosion control• Slope stabilization• Site winterization• Post fire ash containment• Turbidity and TSS control	<ul style="list-style-type: none">• Best measured performance• Less than ½ the installed cost of most rolled mats with better performance• Creates perfect micro-environment for growth and sustainability	<ul style="list-style-type: none">• 50 lb. bale• 40 bales / pallet• 20-22 pallets / truckload• Minimum order quantity: 1 pallet



Erosion Control – Temporary Stabilization/Site Winterization



Revegetation/Dormant Seeding



Revegetation/Slope Stabilization



Proven: Caltrans Testing



2:1 Slope Testing

LA County 10 yr. Storm



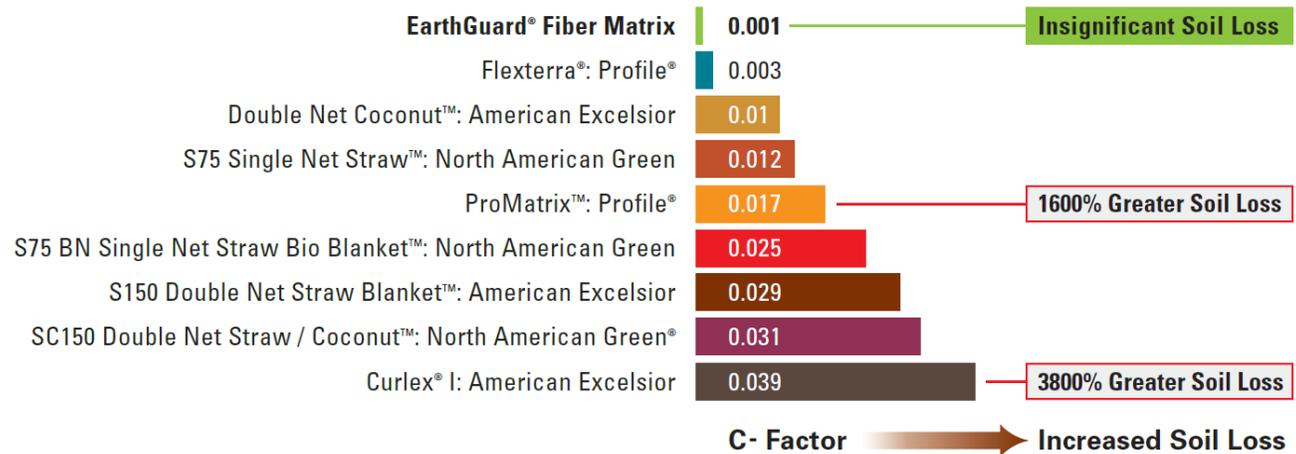
99.5% Effective
After Two Consecutive
Rain Events



Proven: AASHTO/NTPEP ASTM 6459 EarthGuard Testing



NTPEP ASTM 6459 Soil Loss Testing: 1 Hour – 4" Event



0/6/2025



Application Rates

Normal Conditions: Maximum Rainfall of < 20" (480 mm) before adequate vegetative establishment								
	≤ 4 to 1 Slope		3 to 1 Slope		2 to 1 Slope		≥ 1 to 1 Slope	
	Per Acre	Per Ha	Per Acre	Per Ha	Per Acre	Per Ha	Per Acre	Per Ha
EarthGuard Fiber Matrix	1500 LB	1680 KG	1800 LB	2020 KG	2000 LB	2245 KG	3000 LB	3355 KG
OR								
EarthGuard Liquid	4-6 GALS	37-56 LITERS	7 GALS	66 LITERS	8 GALS	75 LITERS	10 GALS	94 LITERS
Mulch	1500 LB	1680 KG	1800 LB	2020 KG	2000 LB	2245 KG	3000 LB	3355 KG

Severe Conditions: Maximum Rainfall of > 20" (480 mm) before adequate vegetative establishment						
	≤ 5 to 1 Slope		4 to 1 Slope		≥ 3 to 1 Slope	
	Per Acre	Per Ha	Per Acre	Per Ha	Per Acre	Per Ha
EarthGuard Fiber Matrix	2000 LB	2245 KG	2500 LB	2800 KG	3000 LB	3355 KG
OR						
EarthGuard Liquid	6 GALS	56 LITERS	8 GALS	75 LITERS	10 GALS	94 LITERS
Mulch	2000 LB	2245 KG	2500 LB	2800 KG	3000 LB	3355 KG



EathGuard® Fiber Matrix



January 2024



February 2024



EarthGuard® Liquid with Mulch





Site Winterization



Application Rates:

Normal Conditions: Maximum Rainfall of < 20" (480 mm) before adequate vegetative establishment

	≤ 4 to 1 Slope		3 to 1 Slope		2 to 1 Slope		≥ 1 to 1 Slope	
	Per Acre	Per Ha	Per Acre	Per Ha	Per Acre	Per Ha	Per Acre	Per Ha
EarthGuard Fiber Matrix	1500 LB	1680 KG	1800 LB	2020 KG	2000 LB	2245 KG	3000 LB	3355 KG





Site Winterization - Slopes



Application Rates:

Normal Conditions: Maximum Rainfall of < 20" (480 mm) before adequate vegetation establishment

EARTHGUARD	≤ 4 to 1 Slope		3 to 1 Slope		2 to 1 Slope		≥ 1 to 1 Slope	
	Per Acre	Per Ha	Per Acre	Per Ha	Per Acre	Per Ha	Per Acre	Per Ha
EarthGuard Fiber Matrix	1500 LB	1680 KG	1800 LB	2020 KG	2000 LB	2245 KG	3000 LB	3355 KG





Stockpile Protection - Stockpiles



Application Rates:

Normal Conditions: Maximum Rainfall of < 20" (480 mm) before adequate vegetation establishment

EARTHGUARD	≤ 4 to 1 Slope		3 to 1 Slope		2 to 1 Slope		≥ 1 to 1 Slope	
	Per Acre	Per Ha	Per Acre	Per Ha	Per Acre	Per Ha	Per Acre	Per Ha
EarthGuard Fiber Matrix	1500 LB	1680 KG	1800 LB	2020 KG	2000 LB	2245 KG	3000 LB	3355 KG



Spring/Fall Seeding

Initial Application: June 2010



Pictures Taken: May 2011



Drainage Swale



Impoundment Embankment



Top Soil Pile



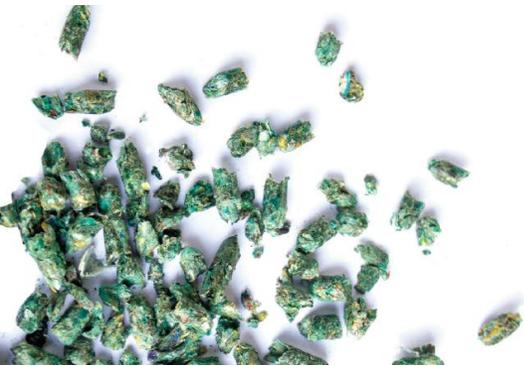
Well Pad Embankment



EDGE™ – EarthGuard® Pellets



Application Methods	Uses	Benefits	Packaging
<ul style="list-style-type: none">• Hand application• Broadcast spreader• Jet agitated hydroseeder• Standard hydroseeder• Aerial application	<ul style="list-style-type: none">• Re-vegetation / Erosion control• Slope stabilization• Site winterization• Post fire ash containment• Turbidity and TSS control• Temporary site stabilization	<ul style="list-style-type: none">• Maximum application flexibility• Saves time and labor – More solids per load• Ideal for remote locations w/ limited/no access to water• Easy to handle and store	<ul style="list-style-type: none">• 50 lb. bag 40 bags / pallet• 1,000 lb. bulk sack 2 sacks / pallet 44 sacks / truckload• Minimum order quantity: 50 lb. bags - 1 pallet Bulk sacks – 1 pallet



EDGE™ contains EarthGuard® science, corn-stover, and premium recycled paper





EDGE™ – EarthGuard® Pellets

Applied Dry

- ▶ Pellet Form – can be applied by hand, mechanically, or air-dropped
- ▶ Effective in:
 - ▶ Remote areas
 - ▶ Areas with limited water access
 - ▶ Frozen ground
 - ▶ Fire reclamation

Applied Wet

- ▶ Sprayed through hydraulic applicator



EDGE™
EARTHGUARD® PELLETS



EDGE™ – EarthGuard® Pellets



Application Rates – Hydraulic Application

NORMAL CONDITIONS: Maximum Rainfall of < 20" (480 mm) Before Adequate Vegetative Establishment

	≤ 4 to 1 Slope		3 to 1 Slope		2 to 1 Slope		≥ 1 to 1 Slope	
	Per Acre	Per Ha	Per Acre	Per Ha	Per Acre	Per Ha	Per Acre	Per Ha
Edge™	1500 LB	1680 KG	1800 LB	2020 KG	2000 LB	2245 KG	3000 LB	3355 KG





EDGE™ : Easy Loading





EDGE™ is Easily Applied



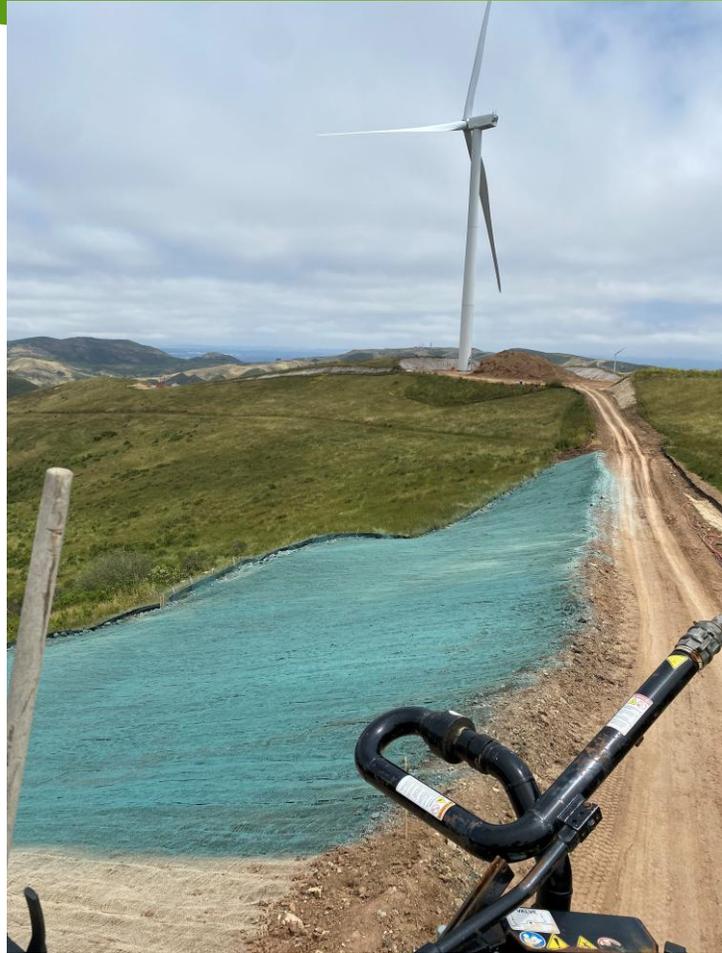
Application Rates – Dry Application

Edge™	≤ 4 to 1 Slope		3 to 1 Slope		≥ 2 to 1 Slope	
	Per Acre	Per Ha	Per Acre	Per Ha	Per Acre	Per Ha
	3000 LB	3355 KG	3500 LB	3925 KG	4500 LB	5045 KG





Wind Farm Applications



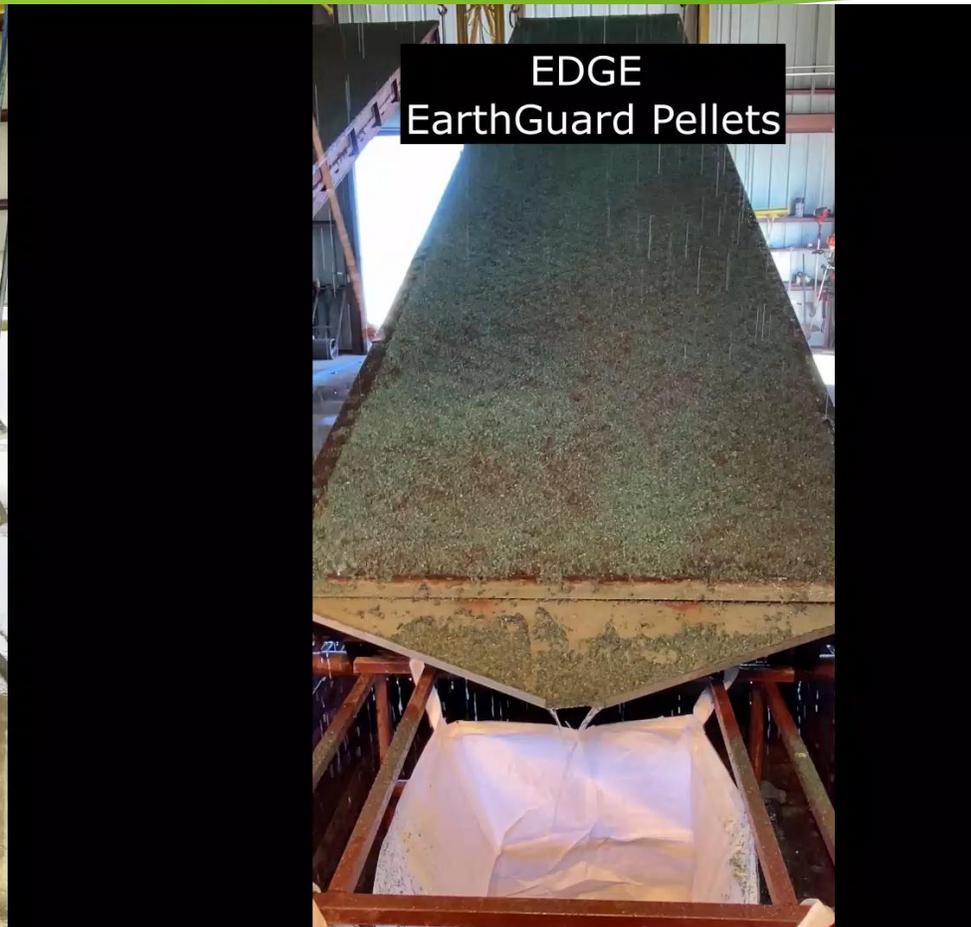
EDGE™ Pellets – Dry Applied Before Rain Activation



EDGE™ Pellets – Dry Applied After Rain Activation



EDGE™ EarthGuard® Pellets vs Straw Blanket





Solar Applications



EDGE™ – Remote Application



Santa Rosa Post Fire Erosion and Sediment Control



2022 Construction General Permit Passive Treatment - Attachment G



- ▶ Passive treatment is the application of natural or synthetic chemicals and products **to reduce turbidity in discharges** through coagulation and flocculation. Passive treatment does not rely on computerized, enclosed systems with pumps, filters, and real-time controls.
- ▶ The discharger shall maintain a copy of the site-specific **Passive Treatment Plan** in the Stormwater Pollution Prevention Plan (SWPPP).
- ▶ Stormwater treated with passive treatment products in a treatment zone prior to being discharged from the construction site shall pass through a sediment control BMP (including, but not limited to, a sediment basin or trap) or filter (including, but not limited to, sand filter or geotextile bag) to settle or remove flocculants prior to discharge from the site.

2022 Construction General Permit Passive Treatment



- ▶ Anionic chemicals are authorized for use in passive treatment systems, typically consisting of polyacrylamides². Passive treatment consisting of polyacrylamides must:
 - ▶ Be free of nonylphenol and nonylphenol ethoxylates, often used as surfactants in emulsion-based products. Emulsion-based products may contain surfactants and petroleum distillates that can be toxic to aquatic life;³
 - ▶ Be food grade (National Sanitary Foundation/American National Standards Institute) products, or contain less than 0.05 percent residual monomer by volume;⁴
 - ▶ Have a charge density between 10 and 55 percent by weight;
 - ▶ Have a molecular weight between 6 and 25 milligrams per mole; and
 - ▶ Be mixed and applied in accordance with Occupational Safety and Health Administration Safety
- ▶ The discharger shall include in the Passive Treatment Plan, current acute and chronic toxicological test data provided by the manufacturer, a laboratory employed by the manufacturer, or a third-party organization.

Passive Treatment Solutions

- ▶ Sediment Control Products (Passive Treatment)
- ▶ Place in channelized flow areas
 - ▶ Upper end of drainage channel
 - ▶ Near earthmoving activities of active construction
- ▶ Turbidity and Total Suspended Solids (TSS) reduction
- ▶ Acceleration of settling rate in detention/sediment ponds
- ▶ Packaged in sleeve netting, replace when necessary





EarthBOUND® Floc Rolls and Tabs





EarthBOUND® Floc Rolls and Tabs



Thank You!



Questions

The LSC logo is a stylized green leaf shape with the letters 'LSC' in white inside.

Liquid	 <p>EARTHGUARD Liquid™</p>		Maximum formulation flexibility
Pellets	 <p>EDGE EARTHGUARD® PELLETS</p>		Maximum application flexibility
Fiber Mulch	 <p>EARTHGUARD Fiber Matrix™</p>		Maximum durability

EarthBOUND®
FLOC TABS PASSIVE TREATMENT –
TURBIDITY CONTROL

EarthBOUND®
FLOC ROLLS PASSIVE TREATMENT –
TURBIDITY CONTROL

FUSION™
EROSION CONTROL &
BIOTIC SOIL AMENDMENT

ORGANIX™
BIOTIC SOIL AMENDMENT

DUST **COV-R**

Posi-Lock™
CONTAINMENT SYSTEM



ENVIRONMENTAL
PRODUCTS, LLC™

Thank you!

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