

STABLE SOIL SOLUTIONS EROSION & SEDIMENT CONTROL FOR SOLAR APPLICATIONS



Best Practices for Erosion and Sediment Control for Solar Field Applications

Introduction

The installation of solar fields often involves significant disturbance of the landscape including the disruptions of natural drainage patterns, exposure of soils to erosion, potential sedimentation into waterway among other environmental issues like habitat loss. In many solar installations, it is not always feasible to completely avoid disturbances of erodible areas. Development and planning of erosion and sediment control plans thus becomes critically important to minimize erosion and sedimentation as near to the source as possible. Followed then by implementing water management systems to reduce the sediment load.

Best practices for erosion and sediment control on solar applications must utilize both proactive and integrated plans that account for mandates to restore vegetation and minimize hard armor. Successful planning incorporates insight from relevant professionals from various disciplines coming together to focus on avoidance and mitigation of high erosion risk areas.

BMPs of Erosion and Sediment Control

Best Management Practices (BMPs) when associated with mining applications must include systems and products that are safe and practical while also meeting strict site regulations. In addition, products and systems must be easy to handle, quick to install, and at a cost effective price point. Establishing permanent self-sustaining vegetation is the most effective BMP for controlling erosion on slopes and in ditches. Four main categories of erosion control products are often used in conjunction with vegetation to achieve this.

- **Erosion control blankets (ECBs):** Temporary, degradable options designed to provide soil stabilization during the vegetation reestablishment phase.
- **Turf reinforcement mats (TRMs):** Permanent, non-degradables mats which support vegetation permanently in areas of high hydraulic potential.
- **Sediment Retention Fiber Rolls (SRFRs):** Sediment control devices aimed to use gravity to eliminate sediment from surface water and are often used as slope interruption devices on steep slopes, or as perimeter control.
- **Anchor Reinforced Vegetated Systems (ARVS):** Combine woven high-performance turf reinforcement mats (HPTRMs) with percussion driven anchors (PDAs) to create an armoring system that is mechanically secured to the ground surface for high load/high survivability applications.

Installation can vary depending on the system selected and site-specific conditions. Fasteners can vary from wire staples and pins, eco-friendly stakes, to higher pull-out strength fasteners such as Twist Pins and PDAs.



Solar farms can see issues with drainage in and around the installed panels, creating issues with sediment movements.



Permanent TRMs can be used to stabilize channels alongside project roadways.



To assist in protecting slopes and allowing for vegetation reclamation, temporary ECBs can be used to stabilize slopes and channels.

A Solution for Every Application



SEDIMENT POND STABILIZATION

The use of vegetation and erosion control along sediment pond edges can help minimize surface runoff erosion from collection sites like sediment ponds. Vegetated pond edges also act to naturally filter sediment from runoff water. A sediment retention fiber roll may also be used at the water's edge to further collect and filter sediment-laden water entering into the water management system.



SURFICIAL SLOPE STABILIZATION

Whether supporting platforms, cut/fill roads, or other disturbed slopes, steep slopes can be protected using a combination of high-performance turf reinforcement mats anchored with percussion driven anchors. Together they can help provide high-strength protection for both surface erosion and potential failure planes on slopes.

LINEAR WATERWAY MANAGEMENT

Linear developments disrupt hill-slope hydrology by capturing surface water in ditches that quickly carry runoff water into channels. Managing erosion and sediment control with the use of permanently reinforced vegetated channels is especially important when topography forces linear waterways to be constructed on steep grades.



TEMPORARY AND PERMANENT ROADWAYS

Runoff control for roads requires construction of ditches to manage drainage. Best management practices include diverting drainage to stable vegetated areas. Temporary ECBs or permanent TRMs in conjunction with vegetation can offer protection of soils and reduce sediment transfer from roads sides to off-site areas.



HABITAT RECLAMATION

Areas being reclaimed are a major focus of erosion control. Whether slopes or channels, one of our temporary ECBs or permanent TRMs can aid in holding soils and seed in place during reestablishment. As an added benefit, many of our RECPs contain natural fibers which can help maintain moisture and regulate soil temperature to assist in quick germination of seed.



Whatever the Problem, We have a Solution

For site-specific design solutions, consult one of our Erosion Solutions Specialists, or use our online project design tool to select an optimum product for the unique properties of your project site.



WATERSTRIDER SOLAR FARM, VIRGINIA

PROBLEM:

The large solar installation required soil groundwork, and the accommodation for new drainage from the area. Part of the drainage plan included the build of a retention pond shaped to the existing contours of the project site. The slopes would require stabilization and vegetation establishment.

SOLUTION:

The SC250 permanent Turf Reinforcement Mat, was selected due to its performance abilities to control erosion and help support the establishment of vegetation along the slopes of the large retention pond. The SC250 combines permanent reinforcement with a natural fiber matrix stabilization.

RESULT:

The project installed was installed in the fall, and started establishing new vegetation before the cold winter months. The site was stabilized through the seasons, allowing for later installation of the solar field on site.



SURFACE MINE, EASTERN TEXAS

PROBLEM:

Large drainage channels and steep grades (up to 6%), created erosion issues on the soft sandy soils at a mine location in Eastern Texas. Stabilization solutions needed to handle heavy storm runoff, while allowing revegetation and reclamation of the site long-term.

SOLUTION:

The PP5-Xtreme, a High-Performance Turf Reinforcement Mat, was selected for its ability to handle extreme hydraulics and high-load applications. To anchor in the sandy soils, a combination of percussion driven anchors and twist pins was selected to provide high-pullout strength in the poor soils.

RESULT:

The anchor reinforced vegetated system installed on steep grade channels has resulted in a nicely vegetated, stabilized project. The twist pins installed proved invaluable in helping keep intimate contact between the HPTRM and the soils to allow quick establishment through the matting.

