

Introduction

The Erosion and Sediment Control Industry is full of innovative and new products that help protect our environment. Over the years, the industry has responded very well to develop products that control erosion and prevent sediment from leaving construction sites, but unfortunately, that is where this innovation has stopped...until now. The desired erosion control solution is to have established vegetation but many construction sites have very poor soil in which to grow strong vegetation. The industry response has been to create longer lasting and more expensive erosion control material or to haul expensive topsoil to the site. Is this the only way? If your soil in your garden was poor, would you put wood or cut up your Sunday newspaper and add it to the soil to make it better? The greenhouse or farming industry would laugh at this suggestion, yet the construction industry is relying on sales people who only sell erosion control solutions such as this, and are not yet aware of the importance of improving soil quality first. Biotic Earth was developed so that project owners and engineers could use an erosion control

product that not only prevents erosion but first amends the soil with the right combination of organic material, micro nutrients and growth stimulants. Fix the soil you have both efficiently and effectively with science, common sense and good old agronomic know-how and you will achieve your desired results in less time. This book shows the Biotic Earth product in action on very poor soils in Canada and the United States. We feel that if it makes sense to add organics to our gardens it makes sense to add it to our construction sites as well.

Enjoy,

Mark Myrowich
Owner
Verdyol Plant Research Ltd.



Mark Myrowich, CPESC, CISEC

Mark Myrowich, owner of ErosionControlBlanket.com has been a Directing Member and on the Board of Directors of the ECTC since 2002. He has been in the erosion and sediment control industry since 1995, starting off as an erosion control contractor owning Mid Canada Hydroseeding, then creating ErosionControlBlanket.com in 2000, to manufacture erosion and sediment control products. In 2004, Mark bought Verdyol Plant Research.

Mark received his Certified Professional Designation in Erosion and Sediment Control (CPESC) in 2002. In 1999, MCH received the Environmental Leader Award from the Manitoba Heavy Construction Association. In 1998, he co-founded the Northern Plains Chapter of the International Erosion Control Association and is currently its Treasurer.

Currently ErosionControlBlanket.com is a Cornerstone member of the IECA, Mark has been a member since 1996.

Case Studies



Table of contents

Case Studies

Milner Ridge.....	0
Dillingham Airport.....	0
Eagle River.....	0
Hawk Lane.....	0
Kenai River Bank.....	0
Kotzebue City Park.....	0
Seward Hwy.....	0
Verbier Way.....	0

MILNER RIDGE

Manitoba, Canada

Contractor:



(204) 782-8813

Milner Ridge, Manitoba

PROJECT DESCRIPTION

Waste water treatment ponds for the Provincial medium security jail. 70,000 m² of slopes and channels to protect.

CHALLENGE

Milner Ridge is the remnant of a sand deposit from Lake Agassiz which was created by the last ice age.

Very little topsoil to salvage and place back on the slope creating a very erodible condition.



OPTIONS

1. The engineering firm received quotes of \$6.00 per square meter to haul and place 4 inches of topsoil.
2. Use Verdyol Biotic Earth Black along with S31 erosion control blankets to kick start the growth of vegetation while controlling the erosion for \$3.25 per square meter.

JR Cousins Engineering firm chose option #2 with the condition that the Contractor, Mid Canada Hydro seeding, guarantee success.

Guaranteed Success was defined as growth to 70% expression or coverage of the site and any erosion that occurred before that growth so that the rills were greater than 2 inches deep were the responsibility of the contractor unless there was a rain event greater than 3 inches in a 24 hour period as determined by the closest Environment Canada rain monitoring station.





Mid Canada Hydro seeding applied seed and fertilizer along with 3900kg/ha (3500 lbs/acre) of Verdyol Biotic Earth™ Black which is a blend of 60% Canadian sphagnum peat moss, 40% mechanically and thermally processed wheat straw fiber with flexible flax fiber along with added mycrozea inoculant, tricontonal growth stimulant and micronutrients.



S31 – Single sided straw blanket was placed on the slopes and
S32 – Double sided straw blanket was placed in the channels.

Blanket was used to prevent erosion on the project. Biotic Earth Black works best when combined with an erosion control product such as a blanket. The blanket will last one year giving the vegetation time to mature.



Project completed May 15, 2009

Milner Ridge, Manitoba





Milner Ridge, Manitoba



DILLINGHAM
AIRPORT
Alaska, U.S.A.

Dillingham Airport Improvements, State of Alaska, DOT & PF



**Knik Construction Company, Inc. (907-245-1865)
and EMC ENGINEERING LLC (907-644-3923)**

PROJECT TIMEFRAME

Quote 2012 – Construction 2014.

PROJECT LOCATION

Dillingham Alaska Airport.

PROJECT DESCRIPTION

The extension of the Dillingham runway will allow for larger cargo plane access and improve safety. Knik Construction took on the task of moving a million tons of fill to extend the North end of the runway allowing greater transportation of the world’s largest Sockeye salmon runs to be shipped throughout the globe.

CHALLENGES

Because the one million tons of fill hauled into the airport project was from gravel chosen for its superior qualities to build a perfect base for the runway, it had little to no organic material for establishing vegetative growth required for erosion protection around the perimeter of the runway. After consultation with EMC Engineering and the representative for the D.O.T. on the project, using the Verdyol Biotic Earth program was decided the best course of action to obtain sustained vegetative growth, project completion and embankment stabilization. Soil testing confirmed the lack of organic material as low as, 1.1% along the runway embankment slopes. For the project to file a Notice of Termination, upon completion, the project required a minimum of seventy percent vegetative coverage. Further complicating this process was the expense and time required to haul topsoil to the project.



Dillingham Airport Improvements, State of Alaska, DOT & PF



SOLUTION

Verdyol Biotic Black as a topsoil alternative was proposed to Knik. With the use of Verdyol Knik eliminated the costs of transportation, labor, and additional time required to use topsoil. A two step process was recommended and accepted by Knik as a value added, cost saving solution for this project. The first application was a combination of; Verdyol, fertilizer and a native



seed blend. Applied hydraulically with existing, on site equipment the mix will provide the materials necessary to build a complete soil structure that will sustain vegetative growth and create a nutrient cycling soil structure. The second step was an application of ProMatrix, bonded fiber matrix mulch to provide a twelve month protective cover from erosion and hold moisture for establishing growth.

Dillingham Airport Improvements, State of Alaska, DOT & PF

MATERIALS	REASONS/BENEFIT	APPLICATION
Verdyol Biotic Earth Black	To build a complete soil structure / Obtain vegetative growth	3,000 pounds per acre
Custom grass seed blend	A combination of native seeds suited to environment / Obtain vegetative growth	2 pounds per thousand square feet
Fertilizer – 10-10-10-8.5	Matching a fertilizer to enhance deficient soil conditions / Obtain vegetative growth	500 pounds per acre
ProMatrix	Provided a twelve month erosion protection / Obtain vegetative growth	3,500 pounds per acre

To Whom It May Concern;

My name is Troy Gray. I was the superintendent on the Dillingham Airport project. At the end of June 2014, my hydro seed crew applied Verdyol Biotic Black Earth for the first time. Application was slightly different than the mulch we normally use, but adjustments were minimal. Because of the small hydroseed applicator equipment we have, we had to make multiple loads to cover the area. That made us experts on the application. Based on the training by Alaska Garden & Pet, ease of use, lower cost of the Verdyol program compared to top soil, and results we obtained, I would suggest this product to anyone.

Troy Grey – Knik Construction

Dillingham Airport Improvements, State of Alaska, DOT & PF



OUTCOME

Based on the short growing season in Dillingham, successful vegetation growth occurred within thirteen days. Daily watering was required for the first ten days due to a dry period in the area. Estimated savings to the Alaska Department of Transportation by using of the Verdyol Biotic Black topsoil alternative was twenty percent.



***EAGLE RIVER
ROAD REHABILITATION
Alaska, U.S.A.***

Eagle River Road Rehabilitation, State of Alaska, U.S.A.



Pruhs Construction Co (907-279-1020)
Jolt Construction (907-892-5658)

Eagle River Road Rehabilitation, State of Alaska, U.S.A.

PROJECT LOCATION

Eagle River Road, Eagle River Alaska (miles 5 to 12).

PROJECT DESCRIPTION

The Eagle River Road project is a seven mile road improvement job consisting of widening, adding a bike path, and general road enhancements through elimination of steep grades, and winding curves. To accomplish this Pruhs Construction started cutting into the largest banks in 2013 and will complete the task in early 2015.

CHALLENGES

To meet the requirements of this project, Pruhs construction made cuts into hill sides with two to one gradients, and slope lengths of over one hundred and fifty feet. Soil conditions on these cuts were over ninety five percent glacial sand. Based on these conditions, Pruhs could not track walk the slope for normal slope stabilization. Lastly to add top soil to these slopes would have had to be done by hand.



Eagle River Road Rehabilitation, State of Alaska, U.S.A.



SOLUTION

For slope stabilization the use of wattles every twenty five feet horizontally along the entire slope length was required. After this installation all slopes were hydro seeded with a combination of Verdyol Biotic Black, fertilizer and a seed mix blended for the area. A second hydro seed application of ProMatrix, bonded fiber

matrix mulch was sprayed to provide a twelve month protective cover against rain erosion. Daily watering was required to maintain proper moisture for establishing vegetative growth in such a sandy environment.



Eagle River Road Rehabilitation, State of Alaska, U.S.A.

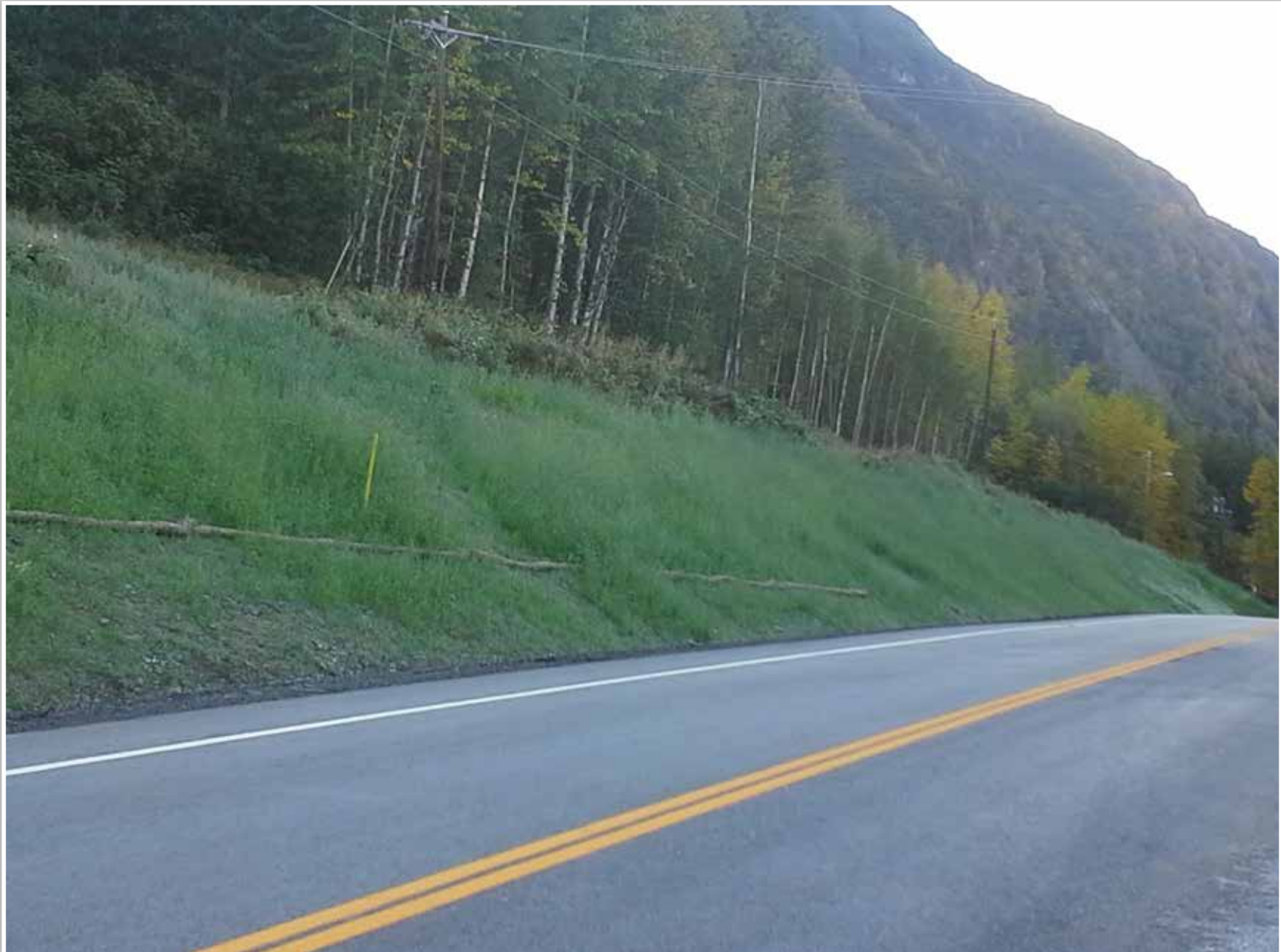
MATERIALS	REASONS/BENEFIT	APPLICATION
Verdyol Biotic Earth Black	To gain a balanced organic based for vegetative growth / Obtain vegetative growth	3,000 pounds per acre
Fertilizer – 10-10-10-8.5	Use of a slow release fertilizer for long term return growth / Obtain vegetative growth	500 pounds per acre
Grass seed blend	Establish a erosion proof environment / Obtain vegetative growth	2 pounds per thousand square feet
ProMatrix – B.F.M.	Provide a twelve month protective barrier / Obtain vegetative growth	3,500 pounds per acre

OUTCOME

Based on a late start of the first season, the application of Verdyol, fertilizer, seed and mulch was determined to be a dormant seeding application, but allowed for slope stabilization during the winter. In early spring watering of the areas completed the year prior started and continued for ten days. During this period vegetative growth was established in most areas. Some small areas required

re-application of the Verdyol program due to winter kill. At the end of the second season all areas with exposed soils were hydro seeded with the Verdyol process and vegetative growth was established to obtain a notice of termination on this successful project.

Eagle River Road Rehabilitation, State of Alaska, U.S.A.



Eagle River Road Rehabilitation, State of Alaska, U.S.A.



Eagle River Road Rehabilitation, State of Alaska, U.S.A.



***HAWK LANE
UPGRADES
Houston, Alaska, U.S.A.***

Hawk Lane Upgrades, Houston, Alaska, U.S.A.



ASRC CIVIL CONSTRUCTION
Sunrise Sunset Landscaping (907-277-6363)

PROJECT TIMEFRAME
June 18th and 19th.

Hawk Lane Upgrades, Houston, Alaska, U.S.A.

PROJECT LOCATION

Just past Big Lake cutoff on the Parks Highway is the Houston City Limits, mile post 58.

PROJECT DESCRIPTION

The Mat Su Borough put a new road into the middle school in Houston, Alaska. Upon completion Mat Su Borough required ASRC to re-vegetate each side of the new road. The roadside was composed of pit run gravel that would not support vegetation. The

Mat Su Borough determined it would be expensive to haul in top soil to the exposed areas and the spreading would require additional equipment. Instead they chose use the Verdyol Biotic Earth program to achieve the vegetative growth necessary for erosion control.

CHALLENGES

Embankment slopes averaging 3:1, and shoulder widths varying from thirty to sixty feet on the new roadside. Rocky soil conditions, with little to no organic matter present in the areas where vegetation is desired.



Hawk Lane Upgrades, Houston, Alaska, U.S.A.

SOLUTION

Verdyol along with a fertilizer and seed blend were applied at a lighter application, as the hydro seed applicator dispensed the product at a moving speed rate the same as mulch. Then came back

and applied a second coat over the same area. A final coat of Eco Fibre wood mulch with tackifier and half again the rate of seed were applied as an erosion control measure.



MATERIALS	REASONS/BENEFIT	APPLICATION
Verdyol	Boost organics in existing soil / Obtain vegetative growth	3,500 pounds per acre
Fertilizer – 10-10-10-8.5	To promote microbial growth in soil / Obtain vegetative growth	500 pounds per acre
Grass seed blend	Provide correct seed for the area / Obtain vegetative growth	3 pounds per thousand square feet
Paper and wood mulch	Gained erosion control protection / Obtain vegetative growth	2,000 to 2,500 pounds per acre depending on slope

OUTCOME

Vegetated growth was achieved within thirty days of application. Final approval was received for project completion based on vegetative growth shown throughout the project. The Mat Su Borough estimated the total cost to use Verdyol was thirty percent less than the cost of using top soil.



Hawk Lane Upgrades, Houston, Alaska, U.S.A.



KENAI
RIVER BANK RESTORATION
Kenai, Alaska, U.S.A.

Kenai River Bank Restoration, Kanai, Alaska, U.S.A.



PRL Logistics (907-261-9440)

Moore's Landscaping (907-283-9168)

PROJECT TIMEFRAME

Started 5/21/14, Completed same day.

Kenai River Bank Restoration, Kanai, Alaska, U.S.A.

PROJECT LOCATION

Kenai, Alaska.

PROJECT DESCRIPTION

Located at a small hotel property, owned by PRL Logistic, on the Kenai River in Alaska, this project required effective erosion control to eliminate excessive tidal erosion near the front viewing deck above the Kenai River. The river bank had been eroding below the deck viewing the Kenai River.

CHALLENGES

Soil conditions ranged from muddy silt to small rip rap. Slope grade from 45 to 60 degrees. A unique challenge would require the installation work to be between tides.



Kenai River Bank Restoration, Kanai, Alaska, U.S.A.

SOLUTION

Located at a small hotel property, owned by PRL Logistic, on the Kenai River in Alaska, this project required effective erosion control to eliminate excessive tidal erosion near the front viewing deck above the Kenai River. The river bank had been eroding below the deck viewing the Kenai River.



MATERIALS	REASONS/BENEFIT	APPLICATION
Verdyol Black Earth	Amend soil condition / Gain vegetative growth	3,000 pounds per acre
Fertilizer – 10-10-10-8.5	Boost biotic in soil / Gain vegetative growth	500 pounds per acre
A Blend of three native seeds	To assure native growth / Gain vegetative growth	5 pounds per thousand square feet
Flexterra Mulch	Erosion protection against rain / Allow tie for vegetative growth	3,500 pounds per acre

OUTCOME

Installation was completed between tide changes. Vegetative growth occurred within twenty nine days. Total erosion control was achieved through anchoring the Enkamat to the existing soil allowing the root systems of the vegetation to establish through the Enkamat, while providing additional natural erosion control. Use of the Verdyol system saved the customer an estimated thirty percent over the use of top soil.



Kenai River Bank Restoration, Kanai, Alaska, U.S.A.



KOTZEBUE
BALL PARK FACILITY
Kotzebue, Alaska, U.S.A.

Kotzebue Ball Park Facility, Kotzebue, Alaska, U.S.A.



Drake Construction (907-442-3512)

PROJECT TIMEFRAME

Product purchased in 2013 for shipping purposes,
applied in September 2014, as a dormant application.

Kotzebue Ball Park Facility, Kotzebue, Alaska, U.S.A.

PROJECT LOCATION

Kotzebue, Alaska has a population of 3,500 full time residents, located 33 miles from the Arctic Circle. It lies on gravel spit along the Arctic Sea. Average temperature in September is 46 degrees.

PROJECT DESCRIPTION

The City of Kotzebue funded a new recreation area consisting of a ball park, open green area and parking lot. The land annexed for this project was connected to the main boat harbor just south of town.



CHALLENGES

Issues on this project were the timing of application, the end of September, which could bring cold weather high winds and even snow. To further complicate the process the soil on site consisted of dredge spoils from the boat harbor. Wet silt sand with almost no organic matter covered eighty five percent of the project. The entire area was five acres right next to open water, so no product leaching or over spray could occur.



Kotzebue Ball Park Facility, Kotzebue, Alaska, U.S.A.

SOLUTION

The Verdyol Biotic Black program was determined to be the best solution due to very low organic matter in the soil. The installation was a two-step process; first a hydro seeding application of Verdyol, fertilizer and a native seed blend was applied to the surface. The second step was the application of Eco Fibre mulch with tackifier



hydraulically applied on top of the Verdyol, fertilizer and seed mix. Because the soil was so wet, hand raking to remove the tire tracks left while applying the mulch had to occur so no deep tracks were left in the field. This process was repeated over the entire area.

Kotzebue Ball Park Facility, Kotzebue, Alaska, U.S.A.

MATERIALS	REASONS/BENEFIT	APPLICATION
Verdyol	To enhance soil conditions / Obtain vegetated growth	3,000 pounds per acre
Fertilizer – Sustane Organic 8-6-4 mix	To increase organic matter in poor soils / Obtain vegetative growth	500 pounds per acre
Custom native grass seed blend	So that only native vegetation occurred / Obtain vegetative growth	2.5 pounds per thousand square feet
Eco Fibre wood mulch with tackifier	To provide erosion control / To obtain vegetative growth	2,000 pounds per acre

OUTCOME

Even with such a late in the season application, and unprecedented rain events an established vegetative growth was achieved. Both the City of Kotzebue and the contractor were pleased with the results experienced through the use of Verdyol, and would use the product again.



Kotzebue Ball Park Facility, Kotzebue, Alaska, U.S.A.



SEWARD HIGHWAY

State of Alaska, D.O.T.

Seward Highway, State of Alaska, D.O.T.



Green Earth Land Works (907-243-7892)

PROJECT TIMEFRAME

Summer of 2014.

PROJECT LOCATION

Seward Highway South, Mile Post 88 & 75.

PROJECT DESCRIPTION

State of Alaska's D.O.T. needed to repair erosion issues to road side areas along the Seward Highway on two different sites. Cause of the erosion was due to water running off the road surface on curves that concentrated all the water to an area that had little to no established vegetation to control erosion.

CHALLENGES

The D.O.T. to gain vegetative growth in the two areas would need to enhance soil conditions. So that the D.O.T. could better understand what was needed they provided Alaska Garden and Pet Supply (A.G. & P.S.) two soil samples, one from each site to determine present soil conditions. Tests showed that each site while slightly different, were deficient in organic material necessary to sustain vegetative growth.



Seward Highway, State of Alaska, D.O.T.

SOLUTION

A.G. & P.S. proposed to the D.O.T. the use of Verdyol Biotic Black as part of a system to boost the soils organics, and provide the microbial activity necessary to allow vegetation to grow and establish while providing the necessary elements for nutrient cycling that will allow vegetation to flourish in the future. This was done with Verdyol and a fertilizer that matched the deficiencies in the present soil. The seed blend used varieties of the native species in the area. After the above was hydro applied, a second application of ProMatrix bonded fibre matrix was applied to provide a twelve month erosion control, and hold more moisture for seed establishment.



MATERIALS	REASONS/BENEFIT	APPLICATION
Verdyol	To replace deficiencies in preset soils / Obtain vegetative growth	3,000 pounds per acre
Fertilizer – 10-10-10-8.5	To boost organic materials in the soil / Obtain vegetative growth	500 pounds per acre
Native grass seed blend	To best match existing grasses / Obtain vegetative growth	3 pounds per thousand square feet
ProMatrix bonded fibre matrix	To provide twelve month protect for erosion / To establish vegetative growth	3,500 pounds per acre

OUTCOME

Complete vegetation grow in was realized, and erosion controlled through the established vegetative. The D.O.T. determined that they gained faster vegetation growth at a lower cost compared to hauling top soil to each site.



Seward Highway, State of Alaska, D.O.T.



***VERBIER WAY
ROAD IMPROVMENT
State of Alaska, D.O.T.***

Verbier Way Road Improvement, State of Alaska, D.O.T.



American Landscape

Verbier Way Road Improvement, State of Alaska, D.O.T.

PROJECT LOCATION

Girdwood, Alaska is a small community that lies in the Chugach Mountains at the end of Turnagain Arm of Cook Inlet. It is the northernmost rain forest in the world, with annual rain of 71 inches and snowfall averaging 218 inches annually.

PROJECT DESCRIPTION

Slope variation between 2:1 and 3:1, on a new road leading to the premier year around ski resort destination. The owner of the project determined it had to have a nicer appearance than open rock cut slopes.



CHALLENGES

Because the conditions of the areas were shale and or broken bedrock with no organic material, the use of Verdyol was determined to be the best option to establish vegetative growth. To further complicate the process it rained during the entire application.



Verbier Way Road Improvement, State of Alaska, D.O.T.



SOLUTION

Because of the extreme wet conditions, the use of Verdyol required an additional soil stabilizer to be added to the first application of the Verdyol, fertilizer and seed mix. This product was Earthbound Scientific Soil Stabilizer, which held the other three products onto the slope until the Flexterra mulch could be applied on a second application to provide complete erosion control.



Verbier Way Road Improvement, State of Alaska, D.O.T.

MATERIALS	REASONS/BENEFIT	APPLICATION
Verdyol Black Earth	To create an environment for growth / Obtain vegetative growth	3,500 pounds per acre
Earthbound Scientific Soil Stabilizer	To hold the Verdyol, fertilizer and seed in place / Obtain vegetative growth	70 pounds per acre
Native grass seed blend	To cover exposed rock / Obtain vegetative growth	4 pounds per thousand square feet
Fertilizer – 20-20-10	Proved food to start seed growth / Obtain vegetative growth	500 pounds per acre
Flexterra Mulch	Provides 18 month erosion control / Obtain vegetative growth	3,000 pounds per acre

OUTCOME

Full vegetative growth was obtained over a rock base to the delight of the Alaska Department of Transportation and the ski resort in Girdwood. No erosion issues on any slope have occurred.



Verbier Way Road Improvement, State of Alaska, D.O.T.

