
THE USE OF POLYMERS FOR DUST AND EROSION CONTROL ON MINE SITES.

Jeremiah Vermillion

President

Environmental Products and Applications

La Quinta, CA

760-832-3278

Jeremiah@eparhino.com

About us:

For five decades, Environmental Products and Applications has been involved in numerous chemical dust suppressant applications throughout the world. These applications have included mine tailing ponds, haul roads, stockpiles and drill pads. The company he founded, Environmental Products and Applications, has developed dust control techniques for a variety of projects from Disneyland to Yodaville. Environmental Products and Applications continues to provide solutions to dust and erosion control issues to numerous mine sites.



Introduction

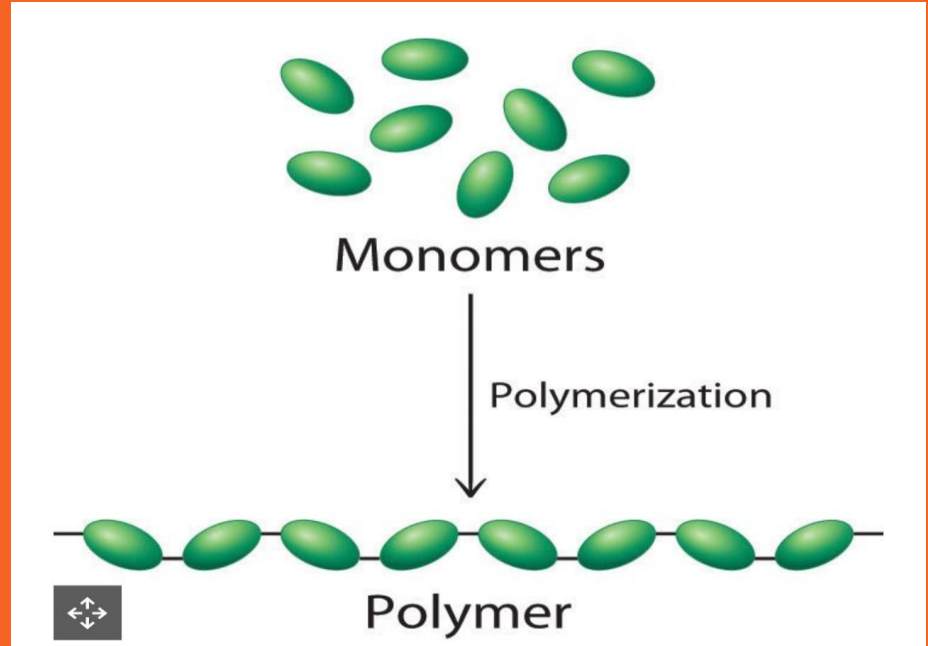
Environmental Products and Applications founded by John Vermillion manufactures and distributes the Envirotac line of products. These products have been successfully used in all 50 states. Our products have been used by government agencies such as the Army Corps of Engineers, United States Department of the Navy, Environmental Protection Agency, California Department of Toxic Substances, Multiple State Traffic Agencies, California State Parks, BLM, USFS, CDFW, SCAQMD and countless private entities.



What are Polymers?

Polymers are large molecules made by bonding (chemically linking) a series of building blocks.

The word *polymer* comes from the Greek words for “many parts.” A polymer is a chain, with each link being a monomer.



How do they work?

Once the water in the Envirotac II/ water solution has evaporated, the active ingredients in Envirotac II glue the aggregate particles together thus providing dust control and increased strength improvement (stabilization) of the road.



Benefits of Polymer

Reduced dust levels; Improved safety, Better driver experience.

Roads are more stable eliminating wind rolling.

Improved air and water quality by reducing particulate matter and sediment runoff;

Improved quality of life of nearby residents; Extended intervals between gravel replacement needs;

Reduced maintenance costs through extended intervals between grader blading and water truck needs;

Reduced public complaints.

Non toxic to plants and wildlife.

Won't kill vegetation like magnesium Chloride.



Case Studies

For five decades, John Vermillion has been involved in numerous chemical dust suppressant applications throughout the world. These applications have included mine tailing ponds, haul roads, stockpiles and drill pads. The company he founded, Environmental Products and Applications has developed dust control techniques to a variety of projects from Disneyland to Yodaville. Environmental Products and Applications continues to provide solutions to dust and erosion control issues to numerous mine sites. Throughout the Environmental Products & Applications existence we have provided dust control solutions to over 1,000 unique customers. Here are case studies on a fraction of these projects.

Equipment

Water Buffalo



Water Buffaloes are used typically to spray areas that are less than an acre.

Water Truck



The most common application method. A 4,000 gallon water truck covers around 4 acres a load and a 2,000 gallon truck will cover 2 acres per load.

Water Pull



Water pulls cover large areas. They can cover 6 to 8 acres per load.



Terra Gator

Terra Gators are typically used to spray tailing ponds.

Track Sprayer



Environmental Products and Applications Yanmar track sprayer operates at 12 psi. It has been used to spray tailing ponds where other equipment cannot

Copper Mines

In 2011 in Arizona , all mining companies together reported releasing at least 100,000 pounds of 13 metals and other toxic compounds, including copper, lead, arsenic, antimony, barium, chromium, nickel and sulfuric acid into the atmosphere. Much of this pollution was in the form of fugitive dust from mine tailings.

To reduce the levels of toxic compounds Asarco had Environmental Products & Applications treat its tailings with Envirotac.



Asarco Sahuarita

After the successful application in Hayden, AZ Asarco contracted Environmental Products & Applications to treat the Sahaurita tailing ponds.

After Asarco capped Tailings Pond 8 with a soil/ Envirotac mixture it developed a 225 acre solar farm. Energy generated from this farm helps power a indigenous community.



Yerrington

ARC companies contracted Environmental Products & Applications to spray polymer to prevent fugitive dust from leaving the 3,400 acre mine site. In order to complete this task Environmental Products and Applications had to modify a Yamnar C80 R from a haul tractor into a chemical dust suppressant application tractor. This tractor operates at 12 PSI making it possible to access previously inaccessible tailings.



Borax

Over the last 30 years Environmental Products & Applications has sprayed the inactive tailings for US Borax. The polymer application of these ponds limits erosion. Rio Tinto has plans to re work these tailings in the future.



Lithium haul road

Environmental Products and Applications was tasked with helping develop a 14 mile haul road in the least populated county in Nevada. This road will see heavy mining traffic. A previous study had found the cost of paving would be a \$1,000,000/mile adding gravel would be \$80,000/mile and Envirotac II would cost around \$45,000/mile



Stockpiles

Polymer has also been used to prevent erosion on Stockpiles. The Golden Queen Mine had Environmental Products and Applications spray polymer on its heap leach pad to prevent the pads erosion until the extraction process was started.



Drill Pads

Polymer has been used to treat drill pads at multiple mine, industrial and construction sites. Polymer prevents erosion and this helps with the integrity and stability of the pad.



Dams

Polymer has been used in the stabilization of earthen dams. We have sprayed polymer for over 30 years on the face of the Ash Canyon Dam in Laughlin, NV. Envirotac II was also used to reinforce emergency spillways at the Oroville Dam. Envirotac II was also used to stabilize the subbase on the construction of a new spillway.



Coal Plants

Environmental Products and Applications has sprayed numerous coal fired power plants with polymers during their power generation and decommissioning phases.



Solar Pads

Environmental Products and Applications has also provided polymers for solar facilities. Dust particles can decrease solar radiation. Dust particles can also short out electrical infrastructure. Envirotac brand polymers have been used to treat solar facilities through out the world.



Wind Farms

Fugitive dust can also damage the electrical infrastructure of wind farms. With the increase of weight with the new generation of turbines Envirotac has been used to strengthen and stabilize roads for heavy equipment.



Helicopter Pads, Runway Shoulders -

Environmental Products and Applications has been used to eliminate dust and stabilize helicopter pads and runway shoulders. At the Mojave Air and Spaceport Envirotac II was used to stabilize the runway shoulders to accommodate the world's largest plane, the Stratolaunch. Envirotac II has been used to create permanent and temporary landing pads for helicopters including the USFS's Sikorsky S-64 Skycranes. Environmental Products and Applications treated the runway for the Joby Air Taxi and the Eero personal air taxi. Envirotac II has also been used on countless air strips for the US military and Foreign military.



Pipelines

The Envirotac line of polymers have also been used to provide dust control to numerous pipelines throughout the world. Pipelines are often located miles away from water sources. The Envirotac line of polymers provide dust and erosion control temporarily until native vegetation re-grows.



Cotino

Environmental Products and Applications has also provided polymer for dust control at Disney's Cotino project. This project will include 2,000 homes and a 27 acre lake



Questions & Answers



Sources

<https://www.snexplores.org/article/explainer-what-are-polymers>

https://tucson.com/news/science/environment/article_07e82f9e-0785-5503-83a8-37f1d53069c3.html

https://tucson.com/business/technology/article_815b6d34-1908-53b7-af52-efc4beb89bae.html

<https://canada.constructconnect.com/joc/news/infrastructure/2013/06/northern-alberta-community-recruits-rhino-snot-in-battle-against-dusty-rural-roads-joc055551w>

https://www.tehachapinews.com/news/golden-queen-mine-could-produce-gold-in-february/article_f83a0142-ee7b-599f-aa26-26395f188440.html

<https://www.hcn.org/40years/blog/the-end-of-the-mojave-coal-fired-power-plant/>

<https://projects.sfchronicle.com/2017/oroville-explainer/>

<https://www.mei.edu/publications/middle-east-s-worsening-dust-storms-are-making-it-harder-deploy-solar-energy>

<https://www.flyingmag.com/modern/maker-of-worlds-largest-plane-tapped-for-hypersonic-test-campaign/>

<https://www.forbes.com/sites/jenniferleighparker/2024/10/04/joby-aviations-electric-air-taxi-prepares-for-takeoff/>

<https://www.theguardian.com/artanddesign/2024/apr/08/disney-town-cotino-california>
