



# Soil-Sement<sup>®</sup>

DUST CONTROL, EROSION CONTROL, STABILIZATION



Industry  
Leadership  
Since  
1975



Since 1975, Midwest Industrial Supply, Inc. has built a reputation of leadership through products and services that continually redefine dust, erosion control and stabilization technology.

Our customers expect products that deliver real benefits, with performance far superior to other types of products being used today.

Our advantages include a full on-site laboratory with the latest state-of-the-art equipment. We also have a group of dedicated, experienced professionals who are always ready to assist you with all of your dust, erosion control and stabilization needs.



# What is Soil-Sement®

Dust and Erosion Control Agent

Soil-Sement® is an environmentally safe, powerful polymer emulsion that produces highly effective dust control, erosion control and soil stabilization. Soil-Sement® provides excellent bonding, cohesion, versatility, cost-effectiveness, environmental compliance and superior overall performance.

Soil-Sement®'s effectiveness results from the length and strength of its unique polymer molecule formulation and those polymer molecule's ability to bond with the surface materials. Its' chemical structure is made of molecules attached in relatively straight linked chains and then cross-linked between other chains or grids that may be 1,000,000 molecules long. It is a true giant compared to the much smaller molecular structure of oil, calcium, petroleum resin and asphalt emulsion products, which range from 100 to 10,000 molecules. As a result, Soil-Sement® can be as strong as steel or as resilient as rubber.

Soil-Sement® is the culmination of 24 years of focused research and development, and unparalleled concentration on PM10, PM2.5, erosion control and stabilization solutions. It yields proprietary one-of-a-kind polymer chemistry manufactured to rigid quality standards utilized in combination with field experience in all industrial, commercial and municipal environments. The result is a performance and value combination that is unequaled by other chemical and polymer products. As a result Soil-Sement® has been the standard of comparison for all chemical types, including polymer products, since it's introduction in 1978. Especially today Soil-Sement® exemplifies the fact that **all polymers are not made equal.**

A Soil-Sement® treated surface will provide you with optimum performance 365 days a year!



# Independent Tests & Certifications Confirm Soil-Sement®'s Superior Performance & Reliability!



**CALCERT**  
INNOVATION ASSURED

Arizona Department of  
Emergency & Military  
Affairs (ADEMA)



Midwest Research Institute



San Diego State University

The world's leading advocates of new environmental technologies, and internationally recognized scientific and engineering evaluators of environmental performance have certified that Soil-Sement® is effective for controlling dust and the damaging effects of erosion and sediment pollution, while protecting the environmental ecosystem.

"Soil-Sement® is used as a dust suppressant, as a soil-stabilization agent, and to control erosion and silt runoff. It is applied to unpaved roads, building pads, parking lots, parks, fields, off-highway motor vehicle parks, and other similar high dust areas. Soil-Sement® has a wide variety of

**Soil-Sement®**  
Dust and Erosion Control Agent

applications other than road surfaces. It has been used to stabilize asbestos-containing soils and can also be used on slopes as a tackifier in hydroseeding applications. Soil-Sement® can be used to reduce windblown dust from ore and coal storage piles, stockpiles, mine tailing sites, power plant ash ponds, construction sites, military applications (vehicle staging areas, helicopter landing zones, trails for rubber tire and tracked vehicles, rapid deployment runways) and to control dust mites in orchards and vineyards." ***(The California Air Resource Board Evaluation of the Air Quality Performance Claims for Soil-Sement®, Dust Suppression - April 2002)***



# CalCert and California Air Resources Board Certification



**CALCERT**  
*INNOVATION ASSURED*

The California Environmental Technology Certification Program (CalCert), an internationally recognized independent, scientific and engineering evaluator of environmental performance, and the California Air Resource Board (CARB), one of the world's leading advocates of new environmental technologies, have certified Soil-



Sement<sup>®</sup> performance. These certifications offer users and clients performance assurances when dependability is important and the cost of failure unacceptable.

"When topically applied as a dust suppressant in accordance with manufacturer's instructions, including a total target concentration of 0.28 gallons of concentrate per square yard of treated surface applied in multiple passes in a single day, Soil-Sement<sup>®</sup> reduced PM<sub>10</sub> emissions by approximately 84 percent after 339 days and 6,780 vehicles (predominantly light-duty) passes on an unpaved roadway consisting of a silty, sandy loam.

Soil-Sement<sup>®</sup> does not contain detectable levels of polynuclear organic matter which includes polynuclear aromatic hydrocarbons as defined by the Federal Clean Act section 112 (b); nor does Soil-Sement<sup>®</sup> contain detectable levels of fluorinated or brominated compounds that could be expected to contribute to ozone depletion or global warming."



"Evaluation of the Air Quality Performance Claims for the Midwest Industrial Supply, Inc. Soil-Sement Dust Suppressant," California Air Resources Board, Executive Order G-096-029-035, April 2002.

**For complete Soil-Sement<sup>®</sup> certification information from CalCert, visit [calepa.ca.gov/CalCert/CertifiedTech/Midwest.htm](http://calepa.ca.gov/CalCert/CertifiedTech/Midwest.htm), or from the California ARB, visit [www.arb.ca.gov/eqpr/mainlist.htm](http://www.arb.ca.gov/eqpr/mainlist.htm), or [www.soilsement.com](http://www.soilsement.com).**

# Midwest Industrial Supply, Inc. Receives Canadian Verification Certificate.

The Honorable Christine S. Stewart, Canadian Minister of the Environment, awarded a verification certificate to Midwest Industrial Supply, Inc. under the Environmental Technology Verification (ETV) Program.

The ETV Program promotes the marketability of companies engaged in the environmental industry by providing assessment and validation of suppliers' technology performance. At the same time, it provides buyers with the assurance that the technology in question does indeed perform as claimed.



**Environmental Technology Verification Program**  
... enhancing the credibility of environmental technologies

**Soil-Sement®**  
Midwest Industrial Supply Inc.'s Soil-Sement®, when applied in accordance with the manufacturer's instructions, will:

1. on unpaved roadways in California's San Joaquin Valley
  - a. achieve at least 95% suppressant efficiency on fugitive dust ( $PM_{10}$ ) for three months after application and at least 80% after 11 months, and
  - b. increase the R-value in the range of 30-40% when measured by ASTM Test Protocols D1883 and D2844, and calculated in accordance with the AASHTO Guide for Design of Pavement Structures, 1986; and
2. in acute toxicity tests, yield  $LC_{50}$ 's for rainbow trout (96-hr) and *Daphnia magna* (48-hr) of at least 7,000 ppm and 21,000ppm, respectively.

License Number: ETV 99005  
Issued to: Midwest Industrial Supply Inc.

**Verified\* Performance**  
March 25, 1999

John McMullen  
President & CEO

**Canada** inc.

\* Refer to Technology Fact Sheet for additional information on the verification of this performance claim.

***The Honorable Christine S. Stewart, Canadian Minister of the Environment presenting Canada Environmental Technology Verification certificate to Robert Vitale, President of Midwest Industrial Supply, Inc.***



**“Canada Environmental Technology Verification,”**  
March 25, 1999.

# Stabilization with Soil-Sement®

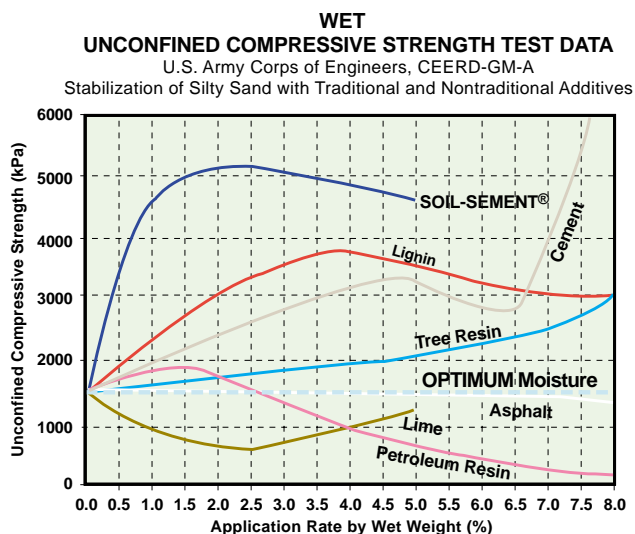
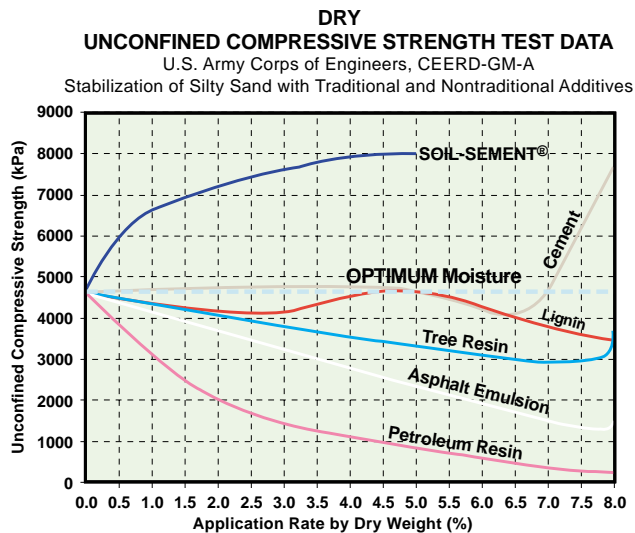
## US ARMY ENGINEER RESEARCH AND DEVELOPMENT CENTER Determines Potential Engineering Benefits of Soil-Sement®

In a comprehensive study just released by the U.S. Army Research and Development Center of 12 non-traditional stabilizers and three traditional types, **SOIL-SEMENT®** (one of the non-traditional types) showed its potential to increase the UC strength of silty sand (SM) material under both “wet” and dry conditions.

The results verified that **SOIL-SEMENT®** polymer emulsion SIGNIFICANTLY improved the UC strength of the SM material (**58 percent in dry test conditions and 208 percent in wet conditions**). Except for cement and polymers, other traditional and non-traditional stabilizers provided no significant potential.

**SOIL-SEMENT®** SIGNIFICANTLY improved the UC strength of the SM material...

**58%**  
in dry test conditions,  
and  
**208%**  
in wet conditions!



*Graphs by Midwest Industrial Supply, Inc. using data from the U.S. Army Engineer Research and Development Center's study of Nontraditional Stabilization of Silty-Sand.*

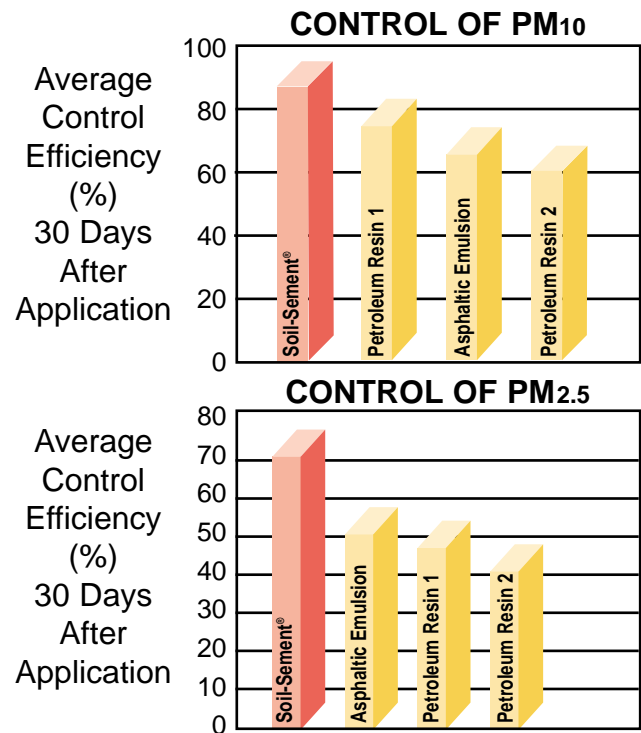
**“Nontraditional Stabilization of Silty-Sand,”**  
Engineering Research and Development Center,  
August 1, 2001.





## US EPA PM<sub>10</sub> and PM<sub>2.5</sub> Control Efficiency Testing

In the most comprehensive study in the iron and steel industry performed for the United States Environmental Protection Agency, Soil-Sement<sup>®</sup> was compared to petroleum resins and asphaltic emulsions in controlled PM<sub>10</sub> and PM<sub>2.5</sub> testing involving unpaved roadways in the iron and steel industry. While all of the products performed at a high level of effectiveness immediately following each application, the true test came when the results were once again compared 30 days later. Soil-Sement<sup>®</sup> maintained an effectiveness rating within 10% of the initial application, while the effectiveness of asphaltic emulsions and petroleum resins dropped significantly.

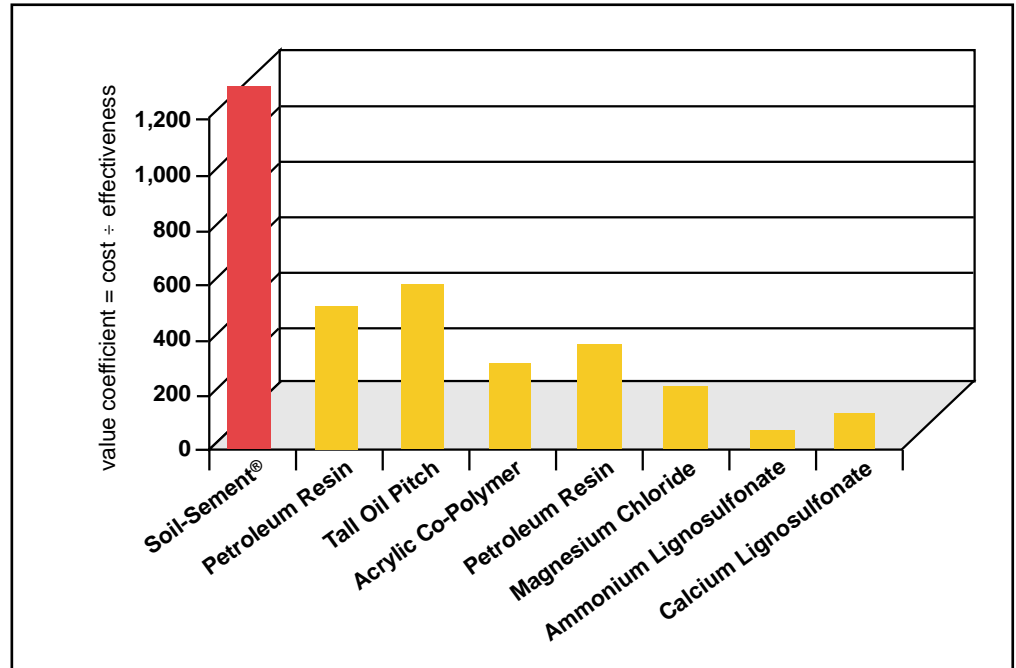


**“Evaluation of the Effectiveness of Chemical Dust Suppressants on Unpaved Roads,”** Midwest Research Institute, MRI Document No: PB88-139936, November 1987.

# SOIL-SEMENT® VALUE COMPARISON

vs. other suppressant types based on performance

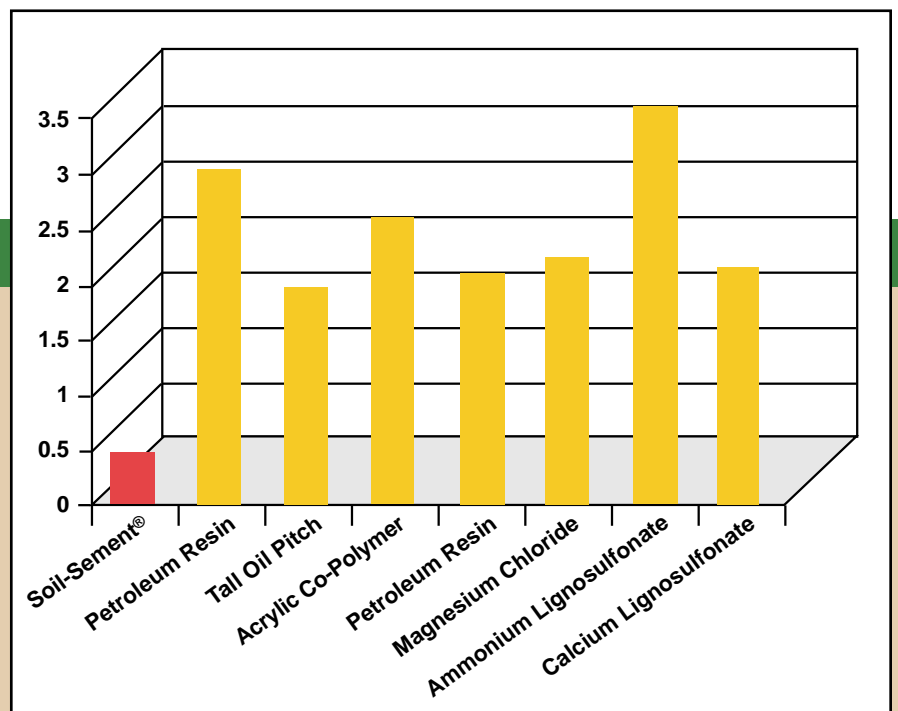
**VALUE:**  
Value coefficient arrived at by dividing weight of dust collected into product cost.



(This value representation works especially well given the wide range of product costs typically available to a client because the value number is a true numeric expression determined by dividing effectiveness into cost.)

■ = GREATEST VALUE

**PRODUCT PERFORMANCE:**  
Weight of the dust collected at the site over a 27-week period



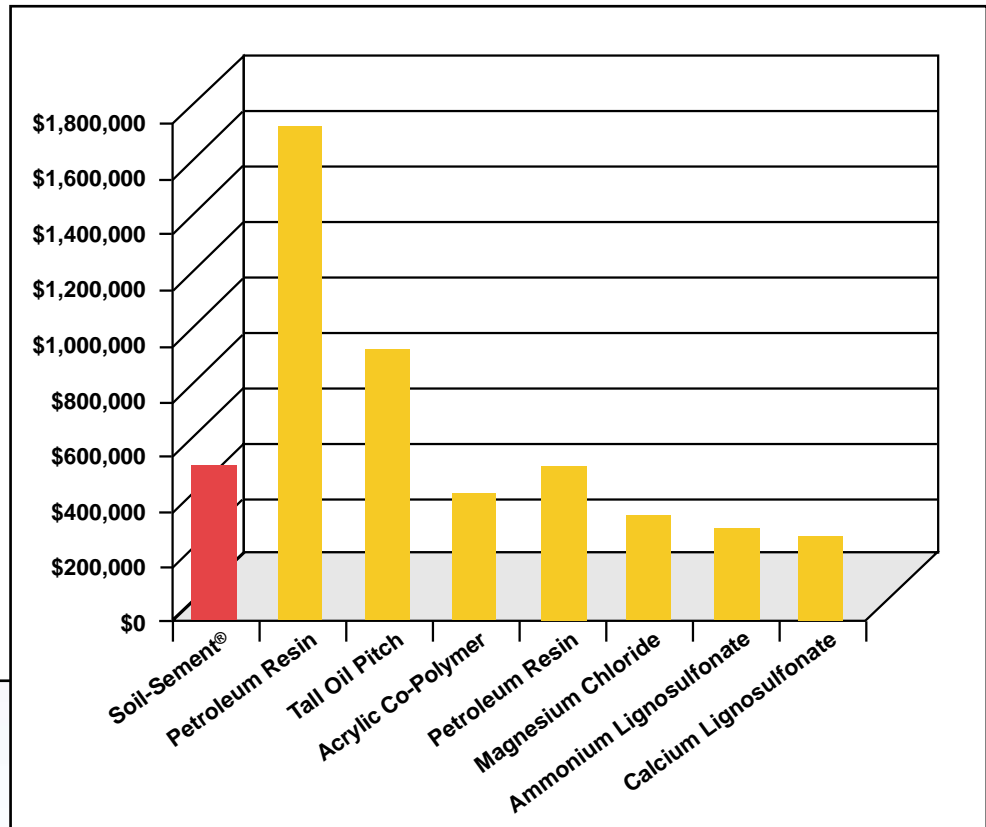
■ = LEAST DUST



# SOIL-SEMENT<sup>®</sup> VALUE COMPARISON

vs. other suppressant types based on performance

PROJECTED  
ANNUAL PRODUCT  
COST:  
Based on  
Manufacturers  
Recommendation



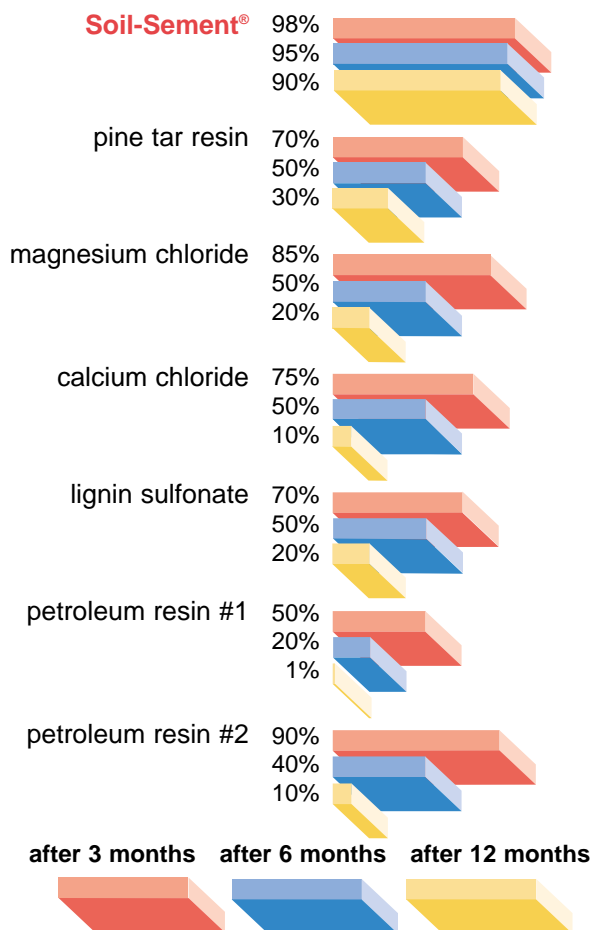
Whether four times more expensive or one-fourth less expensive, no other chemical dust suppressant in this test was close to the product performance of Soil-Sement<sup>®</sup>...

...and Soil-Sement<sup>®</sup>  
provided from  
**200% to 1,200%**  
greater value than  
other products  
in the test!

A county located in the high Mojave Desert region in California initiated a PM10 Dust Control Project to evaluate the effectiveness of various dust suppressants for unpaved roadways. The evaluation was conducted under the direction of the County Air Quality Management District's Board and coordinated through the County Waste Management Engineering Department. The products tested included a pine tar resin, magnesium chloride, calcium chloride, lignin sulfonate, petroleum resins and Soil-Sement®. Test sites were examined at 3 months, 6 months, and 12 months following application. The study found Soil-Sement® to be the product which best endured the test periods, and in fact continued to perform at a high level of effectiveness as both a dust and erosion control agent.

**Soil-Sement®**  
Dust and Erosion Control Agent

**efficiency  
exceeds  
80%  
over one year!**



Experiments conducted by the  
Desert Research  
Institute –  
July 1995 to August of  
1996

determining the efficiencies of dust  
suppressant materials on unpaved public  
roads and unpaved shoulders along paved  
roads.

- Of the products tested, **only Soil-Sement®** was successful in preventing roadbed deterioration (potholes, washboarding, rutting, and areas breaking up).
- Of the products tested, **only the road segment using Soil-Sement®** did not require regrading after 6 months and prior to the maintenance application.
- **Only Soil-Sement®** prevented washing and excessive deterioration of the road surface following bad weather.
- **Only Soil-Sement** retained any practical ability for controlling dust after the 12-month period.

“PROJECT DUST (Dusty Unpaved Surfaces Treatment),” Kern County Air Pollution Control District, October 13, 1994.

Experiments were conducted from July 1995 to August 1996 in order to determine the efficiencies of different dust suppressant materials on unpaved public roads and unpaved shoulders along paved roads.

In an initial survey, more than 60 specific suppressant products were identified. These fell into categories of:

- 1) salts
- 2) asphalt or petroleum emulsions
- 3) emulsions of other materials
- 4) polymers
- 5) surfactants
- 6) bitumens
- 7) adhesives
- 8) solid materials, fibers and mulches
- 9) hydroseed vegetation
- 10) miscellaneous products

Conclusions were drawn with respect to:

- 1) efficiency and durability of each suppressant
- 2) fugitive dust emission rates
- 3) zones of influence of fugitive dust emissions

For the unpaved roads, PM10 was measured upwind and downwind of each test section. For the unpaved shoulder study, in addition to upwind and downwind measurements, fast-response observations from light scattering and turbulence sensors were used. The efficiencies of Soil-Sement® exceeded 80% on average, during the final measurement period, 12 months after application. Of all of the other commercial products tested, the maximum efficiencies after a 12-month period amounted to no more than 49%.

**“Effectiveness Demonstration of Fugitive Dust Control Methods for Public Unpaved Roads and Unpaved Shoulders on Paved Roads,”** Desert Research Institute, DRI Document No.: 685-5200.1F1, December 31, 1996.

## PM<sub>10</sub> Suppression Efficiencies for each Test During Three Intensive Monitoring Periods

DATE	VEHICLE SPEED (km/hr)	SUPPRESSION EFFICIENCY (%)			
		BS <sup>a</sup>	PEP <sup>b</sup>	Soil-Sement®	NHCO <sup>c</sup>
7-22-95	40	56	100	100	N/A
7-24-95	40	20	100	83	
7-26-95	40	37	99	93	
(Average)		38	100	92	
(Std. Dev.)		18	1	8	
7-23-95	55	50	100	94	
7-25-95	55	47	99	100	
7-27-95 <sup>d</sup>	55	-13	94	97	
(Average)		28	98	97	
(Std. Dev.)		36	3	3	
10-17-95	40	3	73	97	N/A
10-20-95	40	-8	67	91	
10-22-95	40	-46	61	94	
(Average)		-17	67	94	
(Std. Dev.)		26	6	3	
10-18-95	55	-10	73	100	
10-21-95	55	37	84	100	
(Average)		13	79	100	
(Std. Dev.)		34	8	0	
6-13-96	40	18	65	90	83
6-14-96	40	-32	55	87	98
6-15-96	40	-20	42	86	89
(Average)		-11	54	88	90
(Std. Dev.)		26	11	2	7
6-19-96	55	-81	43	89	91
6-17-96	55	-75	37	77	97
6-18-96	55	-35	51	84	96
(Average)		-64	44	83	95
(Std. Dev.)		25	7	6	3

<sup>a</sup>Biocatalyst stabilizer (EMC<sup>2</sup>, Soil Stabilization Products).

<sup>b</sup>Petroleum emulsion with polymer (CoherexPM, WITCO).

<sup>c</sup>Non-hazardous crude oil mixture (WSPA).

<sup>d</sup>Negative values denote emissions greater than the untreated section.

# Dust Control Measures Project

By URS Corporation (formerly Dames & Moore)  
for the  
Arizona Department of Emergency & Military Affairs (ADEMA),  
Arizona Army National Guard, Florence Military Reservation

- 6 Month
- 12 Month
- Post Implementation

## 6 MONTH CONCLUSIONS

- The opacity of the dust plumes generated by the convoys on the Soil-Sement® treated areas were lower than 20% as required at the property line.

## 12 MONTH CONCLUSIONS

- The opacity of the dust plumes generated by the convoys on the Soil-Sement® treated areas were lower than 20% as required at the property line.

## POST-IMPLEMENTATION EVALUATION

- The opacity of the dust plumes generated by the convoys on the Soil-Sement® treated areas were lower than 20% as required at the property line.

- The Soil-Sement® palliative appeared to exhibit a tolerance to the type of vehicular traffic of the MSR (Main Supply Route) (generally heavy vehicles with both rubber tires and tracks). At the time of the evaluation (after 1 year), the Soil-Sement® appeared to show some signs of wear but maintained its general integrity at the surface after receiving some heavy, abrasive traffic, particularly from tracked vehicles. The spalling observed appears to be predominantly from the aggregate being crushed or “popped” out of the surface, with only minor flaking of the Soil-Sement®-treated crossing.





## Soil-Sement® and NPDES monitoring.

Beginning in 1975, Midwest Industrial Supply, Inc. has been solving environmental problems, not creating them. When used per the manufacturer's guidelines, Soil-Sement® will help you to meet your NPDES permitting requirements.

### CONTRIBUTIONS TO PHASE I COMPLIANCE BY SOIL-SEMENT®:

- Soil-Sement® will not affect pH levels. As applied, Soil-Sement® is neutral pH.
- Soil-Sement® does not contain oil or grease.
- Soil-Sement® does not contain volatile organic compounds or semi-volatile organic compounds above the regulatory levels.
- Soil-Sement®, when applied correctly and cured, will not increase BOD or COD.
- Soil-Sement® will not increase TSS (Total Suspended Solids) if applied properly. In fact, once dried and cured, Soil-Sement® will decrease the TSS.

### CONTRIBUTIONS TO PHASE II COMPLIANCE BY SOIL-SEMENT®:

Technical data is available showing:

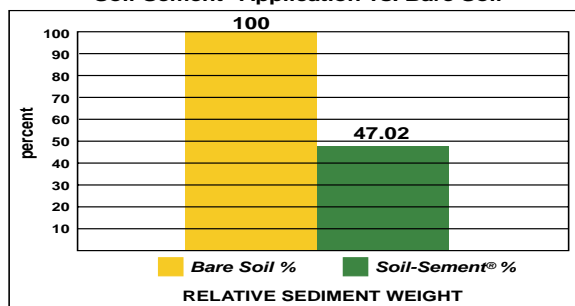
- The effectiveness of Soil-Sement® in binding naturally occurring pollutants such as metals and arsenic to the soil, making them unable to enter into stormwater runoff.
- That Soil-Sement® will prevent dust from becoming airborne and settling as sediment in stormwater runoff.

### DEPARTMENTS OF TRANSPORTATION NOW RECOMMEND:

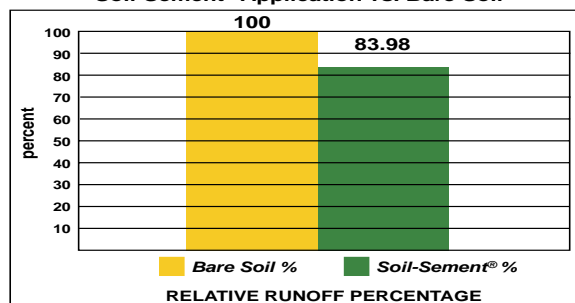
- That methods of erosion and sediment control should be considered "pay items" in the bids and specifications.
- That new road construction is usually funded approximately 80% by the federal government, and on-going maintenance is 100% funded by each state, therefore it is more economical to plan the erosion and sediment control into the initial budget.
- Part 91, Soil Erosion and Sedimentation Control, of the Natural Resources and Environmental Protection Act requires that soil and sedimentation control be considered throughout the development and delivery phases of a project, including planning, design, construction and maintenance.

## Runoff Characteristics & Sediment Retention Under Simulated Rainfall Conditions

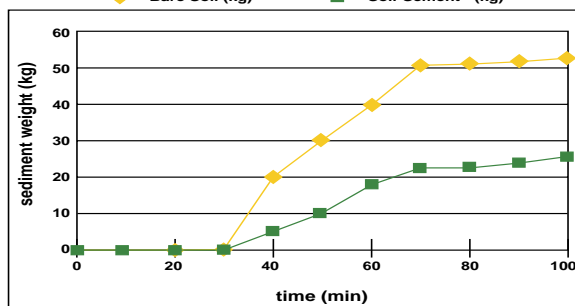
Relative Sediment Weights Comparison for a 10-year Storm Event on a Soil-Sement® Application vs. Bare Soil



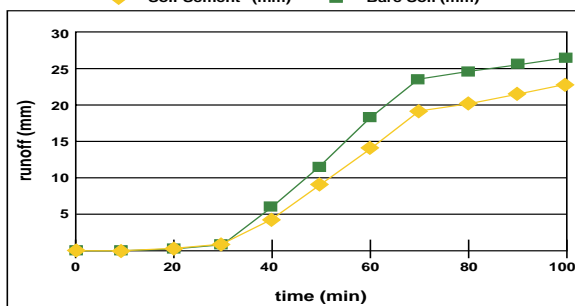
Relative Runoff Percentage Comparison for a 10-year Storm Event on a Soil-Sement® Application vs. Bare Soil



Cumulative Sediment Delivery for Soil-Sement® vs. Bare Soil Over Time



Cumulative Runoff for Soil-Sement® vs. Bare Soil Over Time



"Runoff Characteristics and Sediment Retention Under Simulated Rainfall Conditions," San Diego State University, SDASU/SERL PROJECT REFERENCE NO.: 2001-01-MIS, March 15, 2001.

# Soil-Sement® and YOU:

## Proven Health & Environmental Results

1. Acute toxicity tests yield LC50's for rainbow trout (96-hr.), and Daphnia Magna (48-hr.) of at least 7,000 ppm and 21,000 ppm, respectively.
2. Soil-Sement® does not contain chemicals known to cause cancer or reproductive toxicity as designed in California Health and Safety Code Proposition 65.
3. Soil-Sement® does not contain any polycyclic organic matter (POM) which includes polynuclear aromatic hydrocarbons (PAH), as defined by the Federal Clean Air Act; nor does Soil-Sement® contain fluorinated or brominated compounds that could be expected to contribute to Ozone Depletion or Global Warming.
4. The 96-hour LC50 of Soil-Sement® undiluted concentrate for fathead minnows, pimephales promelas is greater than 750 mg/L using the aquatic bioassay protocol found in Title 22, Section 66261.24(a)(6) in the California Code of Regulations (CCR).
5. Soil-Sement® does not contain concentrations of the metals listed U.S. EPA CFR Title 40, Chapter 1, Subchapter 1, Part 261.24 and in Title 22, Section 66261.24(a)(2)(A) of the California Code of Regulations (CCR) greater than their corresponding STLC and TTLC values.
6. Soil-Sement® upon curing is insoluble in water and reduces soil erosion and sediment delivery in extreme rain events approximately 53%. Soil-Sement® will not contribute, greater than regulatory levels, TCLP organics or heavy metals to stormwater runoff.





## Outstanding Features and Benefits<sup>®</sup> of Soil-Sement:

Eliminates PM<sub>10</sub> and PM<sub>2.5</sub> particulate matter.

Does not contain any polycyclic organic matter (POM) which includes polynuclear aromatic hydrocarbons (PAH).

Is environmentally safe, non-toxic, non-corrosive, non-flammable and does not pollute ground water.

Has a cumulative effect and creates a stabilized surface which will resist shifting, breaking up or sink failures.

Offers maximum weatherability to wind, rain, ultraviolet light and other weather conditions.

Increases load-bearing strength of all types of soils and surfaces.

Prevents water from seeping into and destabilizing the surface.

Dries clear, providing an aesthetically pleasing appearance.

Meets air, water, groundwater and stormwater compliance.

Soil-Sement® is used worldwide by:

- Airports
- Air Quality Compliance Agencies
- Construction/Development Companies
- Erosion Control Industry
- Hydroseeders
- Industrial Plants
- Intermodal Yards
- Iron & Steel Industry
- Military
- Mining
- Municipal Districts
- Parks, Golf Courses & Recreational Areas
- Quarries
- State & County Departments of Transportation
- Utility Companies
- Water Quality Compliance Agencies
- Wineries



COMPLETE REPORTS AND TECHNICAL DATA  
AVAILABLE UPON REQUEST



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