Road Stabilization
And Dust Control
What to expect from SOS Environmental & Services?

- **Dust Control?**
  - Less Road Maintenance
  - Choices to meet needs and budget
  - Technical Support

- **Road Stabilization?**
  - Sub base for asphalt or cement
  - Replacement for asphalt or cement
  - Seal coats for soil stabilization or cement surfaces
  - High strength, high durability top coat
  - Substantially reduced cost
Unique Features of SOS Environmental Products

- Efficient application of product via microemulsion technology
- Denser matrix using nano technology
- Use of high strength cements
- Liquid applications
- Low water to solids ratios
- Seal coats normally only used for high end surfaces
Let’s start with dust control…
(by answering some questions about your situation)

• Are you just addressing some neighbor complaints?

• Do you want to improve or preserve your road/yard?

• Do you want to reduce your labor costs?

Take a minute, give these serious thought and answer each with yes/no.
If you have a yes for (1) or a no for (3) see column A

<table>
<thead>
<tr>
<th>Surface Option</th>
<th>Deeper Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Do a surface treatment</td>
<td>• Reform the road or yard</td>
</tr>
<tr>
<td>• Use a low cost product</td>
<td>• Use a balanced product</td>
</tr>
<tr>
<td>• Repeat often</td>
<td>• Touch up periodically</td>
</tr>
<tr>
<td></td>
<td>• Put money in the bank</td>
</tr>
</tbody>
</table>
Dust control leads to road stabilization – they are directly linked.

Dust, or fine particles, are what holds a roadbed or truck yard together. Without the fine particles, binding becomes very difficult.
Common way to proceed with dust and road stabilization

• Surface treat in areas problematic to people complaints

• When a road needs to be repaired, treat for dust at the same time.

• Preferred repair sequence:
  • Dig fines out of the ditches and place them back on the road such that the ditches drain readily
  • Spread windrow gravel and fines evenly on the road
  • Spray Dust Master and mix with grader
  • Create a crown with the grader
  • Spray again to seal and bind surface
  • Compact with a rubber tired roller on smooth drum roller
  • Apply a 0.1 gal/sq yd seal coat
What to do if spraying is all that is possible?

• Wet the dust with a 10:1 dilution with water wetting surfactant added

• Allow traffic to travel the road to compress and mix the dust into the road base

• After traffic has collapsed the dust material onto the base, apply a diluted Dust Master or Dust Check

• Reapply as necessary, adjusting the dilution up or down to meet your specific needs.
SOS Environmental Products & Services

- There is a wide range of dust control & stabilization products and services available from SOS Environmental.
  - Rig site stabilization
  - Pipe and truck yard stabilization
  - Road stabilization and technical service
  - Dust Control
  - Surface sealers
A good dust program can save a bundle on yard maintenance!
Used successfully on rig locations and lease roads...
County Roads...
Drilling pipe yards on unstable clay...
High Compressive Loads in a Wet Environment
Greenfield Site Development

From low plastic limit clay to:

High Compressive Load Site
Reasons for Effectiveness: Nanoparticles

Submicron particles, in combination with surface tension reducers, can penetrate into the small voids in the soil. There they set up ceramic bond bridges between the soil particles.

While the liquid is dark brown, it is laden with millions of sub-micron particles.
Reasons for Effectiveness: Special Cement Mixes

Ordinary Portland Cement (OPC) will have 28 day compressive strengths of 5,000 – 6,000 psi. With other components, this strength range can be shifted to 9,000 – 11,000 range.

Depending upon the objectives, the mixture can be adjusted for freeze-thaw issues, water requirements, tougher surfaces, etc. The options are endless.
Reasons for Effectiveness: Moisture Control

Proctor Density

Wet Density (lb/cu ft) vs % Moisture

Effect of Dispersant

Dispersant shifts density curve up and to the left; e.g., more small particles enter the void spaces.
Procedure: Sampling

1. Sample site, nearby soil and other relevant materials.
2. Get size distribution.
3. Check liquid limit, plastic limit, PI.
5. Proctor Density Curve.
Procedure: Sampling

If the site is problematic; e.g. no history as to the subsoil composition, then SOS Environmental may elect to take core samples.

This is an inexpensive way to determine the condition of a future site.
Procedure: Mobilization

Mobilization includes:

1. Getting storage tanks on location
2. Getting dry materials on location;
3. Getting liquids on location;
4. Lining up yellow iron and coordinating with yellow iron contractor
Procedure: Initial Reclaiming/mixing

Spread any dry materials on evenly on location.

Depending upon the soil characteristics reclaim 6-15 inches before adding any liquid materials.

Depending upon the time allowed more than one reclamer may be required.
Procedure: Surface Activation

The activation mixture prepares the soil particle surfaces so that ceramic bonds can easily form.

The activation mixture also lowers the surface tension so that the mixture can flow into the smallest of soil pores.
Procedure: Spray DCP – 100 A and B Mixtures

Liquid and nano-sized mixtures that create the cement bonding with the soil.
Procedure: Reclaim thoroughly
Procedure: Level to grade

Shoot grade on 10 foot centers to avoid bird baths on location.
Procedure: Padfoot and Grade before Smooth Drum
Procedure: Smooth drum and rock (if necessary)
Sealing of the limestone surface is an alternative available if full depth treatment is not necessary.

This treatment creates a cement surface coating that significantly reduces water penetration to the pad.
Dust Control: After

SB2 rock is often used as the top coat. It should be watered and compacted according to a Proctor Density curve; otherwise, it can act as a sponge on the surface of your pad.
Summary

- Maximum treatment rate: 1.25 acre/day

- DCP-100 works on clay, well graded and sandy soil

- Sandy soil requires either clay addition or more concentrated mix

- Cost: $15,000 - $45,000 per acre – depending upon depth and compressive load required.