

# Dust Control Down to a Science

4 Year Case Study of Dust Control Program at an Industrial Facility



## Background

Due to the negative human and environmental impacts of fugitive dust emissions produced from industrial facilities, the US EPA has implemented regulatory requirements aimed to limit the total volume of fugitive dust emissions and the volume of respirable dust emissions generated at industrial facilities. In order for these facilities to stay operating within the regulatory requirements, a quality dust control program is required.

## The Challenge

Industrial manufacturing facilities pose specific and ever-changing challenges that require complex yet flexible dust control program to achieve and exceed the rigid dust emissions standards set by regulatory agencies. As the leaders of the industry, Midwest confidently and strategically takes on these challenges via a complete turnkey program that allows the customer to focus on manufacturing without the worry of regulatory violations.

## Establishing an Effective Dust Control Program

Midwest's ultimate focus in providing effective dust control is on "program, not product" – this approach is proven to have longer-lasting results than a one time, temporary fix. Starting in 2017, Midwest worked in conjunction with the customer's Emission Reduction Program (ERP) to establish an ongoing work practice standard with the aim to sufficiently mitigate fugitive emissions while minimizing the total volume of dust suppressant chemical applied. Several products and chemistries were selected for use in the first year to determine the best economical and performing solution. Based on the results of the first year, EnviroKleen was selected and used in the subsequent years.

## EnviroKleen

EnviroKleen is an environmentally friendly synthetic organic fluid formulated with a polymeric binder system that works to agglomerate fine silt or clay particles making them larger so they cannot become airborne. It is applied topically without a requirement for the addition of water. EnviroKleen has proven its capabilities in a wide variety of sites and conditions including the extreme demands of haul roads, oil and gas exploration, gravel runways, industrial facilities and military sites while still being environmentally friendly enough to be applied in sensitive areas such as wetlands. The advantage is that it is long lasting, does not wash away and is not destroyed by mechanical damage to the surface by heavy or tracked vehicles as demonstrated by the annual residual benefits achieved in this program.



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### Evaluating and Monitoring the Performance of the Program

To quantify the effectiveness of the Dust Control Program, Midwest's Dust Control Engineering group conducted routine performance monitoring consisting of:

1. **Instantaneous Visual Emissions Observations (VEO)** – VEO's are an U.S. E.P.A. method in which a certified observer evaluates, quantifies, and records the opacity of a dust plume using a standard and recognized procedure.
2. **Silt load sample collection and testing** - Silt Load testing is an US E.P.A. method used to predict and quantify dust emissions from the resuspension of loose material on the unpaved surface due to traffic. Per EPA's AP-42 document, the term "silt loading" refers to the mass of silt-size material per unit area of travel ( $\text{g}/\text{m}^2$ ).

### Results of the Program: Visual Emissions Observations

Year	Annual Pre-treatment VEO Average Opacity	Pre-treatment VEO Range	Treated VEO Average Opacity	Treated VEO Range	Annual % Reduction in Average Opacity
2017	47%	10-75%	9%	0-30%	81%
2018*	40%	25-75%	16%	0-25%	60%
2019	25%	15-40%	10%	0-25%	60%
2020	18%	10-25%	10%	0-20%	44%

*\*5 additional untreated areas were added in 2018 that did not receive treatment in 2017 – resulting in slightly higher average treated opacity than see other years.*

The average treated opacity readings were reduced by over 80% in the first year of the program. This level of reduction in opacity was maintained throughout the program except for 2018 during which the treatment areas expanded to include five additional areas not previously treated in 2017 therefore no residual benefits of the program were realized in those areas.

### Results of the Program: Silt Loading

Year	Untreated Average Silt Load ( $\text{g}/\text{m}^2$ )	Annual Pre-treatment Average Silt Load	Annual Treated Average Silt Load ( $\text{g}/\text{m}^2$ )	Annual % Reduction in Silt Load	% Reduction in Silt Load vs Untreated
2017	2231.00	2231.00	230.00	90%	90%
2018		582.00	54.03	91%	98%
2019		160.27	91.05	43%	96%
2020		464.50	63.10	86%	97%

The dust control program reduced the silt load by 90% during the first year. A greater than 95% average reduction in silt load was achieved and maintained through the subsequent three years of the program when compared to the average untreated silt load.

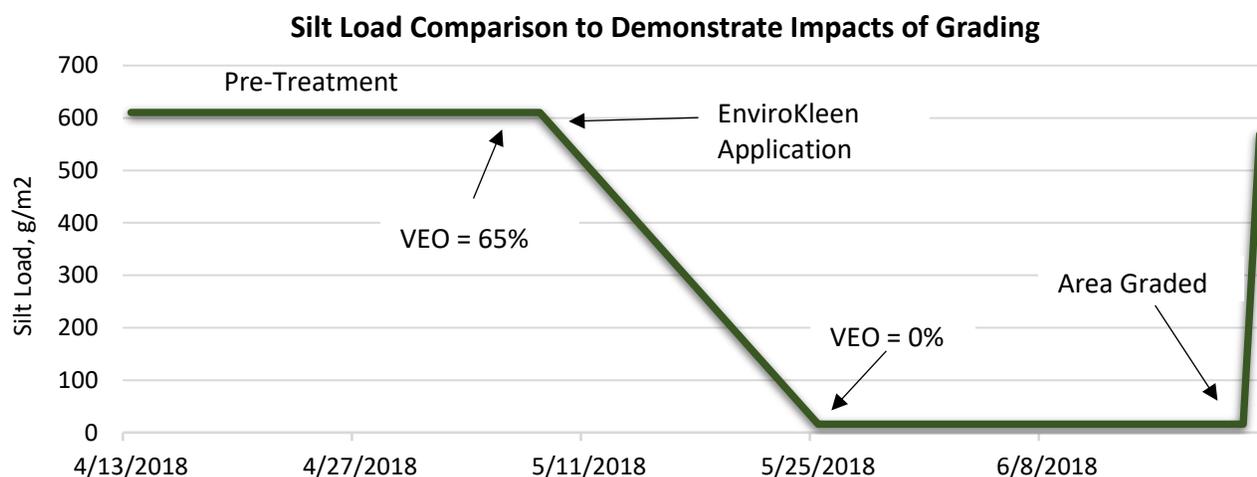
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## Additional Findings: Negative Impacts of Grading Treated Areas

Grading unpaved areas during the dust control season greatly diminishes the effects of the dust suppressant, requiring retreatment to remain effective. Below is an example of the dramatic impacts on silt load results and treatment efficacy when a recently treated area is graded.



## Additional Findings: Residual Benefits of EnviroKleen

Pre-season evaluations conducted in 2018 – 2020 indicate a notable reduction in VEO and silt load results when compared to the untreated results collected in 2017 prior to the start of the program. The chart below shows the beneficial and cumulative effects of the previous season’s treatments.

**Evaluation of Pre-Season Results and Residual Benefits (2017-2020)**

	Year 1 - 2017 (Pre-Treatment)	Year 2 - 2018*	Year 3 - 2019	Year 4 - 2020
Average VEO (% opacity)	47%	40%	25%	18%
% Reduction	NA	15%	47%	62%
Average Silt Load (g/m <sup>2</sup> )	2231	582	160	465
% Reduction	NA	74%	93%	79%

\* Additional untreated areas were added in 2018 from the previous year.

As the ground inventory of EnviroKleen is established and built up, the residual effects are seen in the following years pre-season evaluations. By the start of Year 4 of the program, the pre-season VEO readings and silt loads were down 62% and 79% respectively, compared to the untreated readings collected prior to initiating the Dust Control Program.