

Dust Control Down to a Science

5 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. For over 5 years, Midwest has 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.

The program began as a "hybrid program" in which two or more chemistries are used in rotation to control fugitive dust emissions. Each chemistry has its own unique properties and benefits. When used strategically in conjunction with each other, this product combination is a very effective method for minimizing dust control emissions especially at industrial facilities. Based on the successful trial of EnviroKleen in the shipping yard, the majority of the facility was switched over to EnviroKleen in 2020.

As part of the Dust Control Program, Midwest evaluated and monitored the dust emissions generated on selected paved roads throughout the facility to ensure compliance with the customer's Permit to Operate. Dust control on the paved areas consisted of routine high pressure flushing and/or sweeping.

Evolution of the Program

Year	# of Unpaved Areas	# of Paved Areas	Products Applied	Change in Truck Traffic Volume from Previous Year
2016	11	8	Petrotac, EDC	NA
2017	18	17	Petrotac, EDC	22% Increase
2018	6	10	Petrotac, EDC, EnviroKleen (Trial)	15% Increase
2019	?	?	Petrotac, EDC, EnviroKleen (Trial)	22% Decrease
2020	16	10	EDC, EnviroKleen	NA

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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 (g/m^2).

Results of the Program: Visual Emissions Observations

Year	Unpaved Areas Treated VEO Range	Unpaved Areas Average Treated VEO	Paved Areas Treated VEO Range	Paved Areas Average Treated VEO
2016	NA	NA	NA	NA
2017	0-25%	7%	0-30%	11%
2018	0-30%	9%	0-25%	9%
2019	0-20%			
2020	0-40%	8%	0-15%	7%

Results of the Program: Silt Loading on Unpaved Areas

Silt load testing was performed in three unpaved areas to determine the volume of loose surface silt content over the course of the 2020 dust control season. The chart below demonstrates the reduction in silt load achieved and maintained at 3 selected unpaved areas throughout the 2020 dust control season.

Location	Untreated Silt Load, g/m^2	Avg. Silt Content During Season (g/m^2)	% Reduction in Silt Load Maintained Through Season
Shipping Yard	486.65	156.89	68%
Scrap Yard	1564.15	272.90	83%
16" Bloom Yard	1400.61	479.60	66%
Average	1150.47	303.13	74%

An overall average reduction of 74% was achieved and maintained through the 2020 season at the three identified unpaved areas.

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Results of the Program: Silt Loading on Paved Areas

Silt load testing was performed on a selected paved road in 2018 to determine the efficacy of the water flushing program. A sample was collected and tested early in the dust control season (April) prior to water flushing and later in the dust control season (October) to evaluate the reduced and maintained silt load level. Both samples were collected under dry conditions.

Date	Silt load, g/m ²	% Reduction
4/10/2018	71.65	92%
10/17/2018	5.24	

The results of this testing indicate that water flushing is an effective means of controlling potential fugitive dust emissions. This testing provided credible evidence to confirm that this control measure meets and exceeds the 9.7 g/m² limitations required per the site's Part 70 - Permit To Operate.

Conclusions

Based on consistent on-going performance monitoring, testing and discussions with site personnel, the following can be concluded:

1. The dust control plan created and implemented for this particular site has successfully maintained average opacity levels of less than 15% throughout each dust control season since the inception of the program.
2. The trial of EnviroKleen in the shipping yard proved successful and was expanded the following year to 14 of the 16 treated areas.
3. Silt Load testing indicates that EnviroKleen achieved and maintained an average reduction in silt load of approximately 74% through the 2020 season.
4. Silt load testing confirmed that the paved roads were below the maximum 9.7 g/m² limitations outlined in the site's Permit To Operate.
5. The Dust Control Program continues to satisfy and exceed the requirements of the site's ERP and EPA Division of Air Pollution Control Title V Permit.