



## FIELD REPORT

### TEST DETAILS

<b>Country and region:</b>	Brazil, Minas Gerais	<b>Average temperature:</b>	Strong heat. Avg. 28.8°C
<b>Type of soil:</b>	Red soil. Avg. concentration: 70% fine material, 30% gravel clay road with an important amount of loose rocks	<b>Air relative humidity:</b>	Moderately humid. Avg. 55%
<b>Type of traffic:</b>	Moderate to intense: Heavy and light trucks, mining machinery, service trucks	<b>Test weather conditions:</b>	Clear weather
<b>Test zone area:</b>	Width: 20 m, Length: 200 m, Total area: 4000 m <sup>2</sup>	<b>Dust Measurement Tool:</b>	DustTrak

#### Application timeline:

##### DAY 1 - 1<sup>st</sup> application:

% rate: 100% EA1™

Dosage: 2L/m<sup>2</sup>

EA1™ consumption: 8000 L

##### DAY 10 – 1<sup>st</sup> maintenance:

% rate: 50% EA1™

Dosage: 2L/m<sup>2</sup>

EA1™ consumption: 4000 L

##### DAY 29 – 2<sup>nd</sup> maintenance:

% rate: 33% EA1™

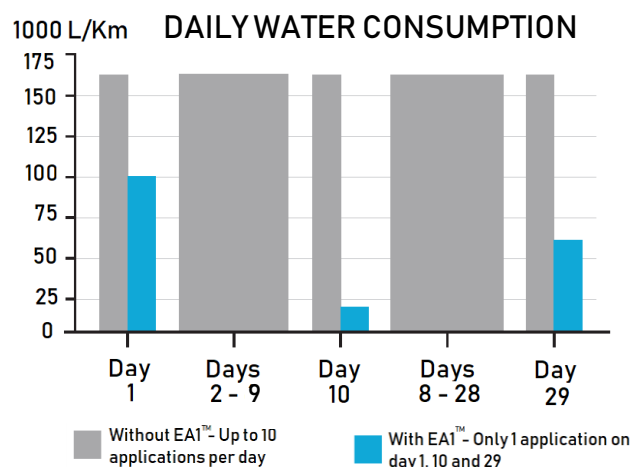
Dosage: 2L/m<sup>2</sup>

EA1™ consumption: 2800 L

### RESULTS

EA1™ Dust Suppressant has positive results in the reduction of water consumption for the maintenance of the roads. Without EA1™, 960,000 L (96 m<sup>3</sup>) would have been used monthly to control dust on the tested area. With EA1™, only 36,000 liters (36 m<sup>3</sup>) were consumed. **This represents a water consumption reduction of 96% (Fig 1).**

The amount of dust was measured with the DustTrak tool, installed both in the static and mobile format. EA1™ Dust Suppressant allowed a **decrease of 98% in the particulate material emission.**



**Fig. 1:** Daily water consumption graph: more than 96% of water consumption reduction



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### TEST DETAILS

<b>Country and region:</b>	Brazil, Minas Gerais	<b>Average temperature:</b>	Strong heat. Avg. 28.8°C
<b>Type of soil:</b>	Clay road with an important amount of loose rocks and fine material: 70% fine material, 30% gravel	<b>Air relative humidity:</b>	Moderately humid. Avg. 55%
<b>Type of traffic:</b>	Moderate to intense: Heavy mining machinery, service and light trucks and conventional vehicles	<b>Test weather conditions:</b>	Clear weather
<b>Test zone area:</b>	Width: 12 m, Length: 500 m, Total area: 6000 m <sup>2</sup>	<b>Dust Measurement Tool:</b>	DustTrak

#### Application timeline:

##### DAY 1 - 1<sup>st</sup> application:

% rate: 100% EA1™

Dosage: 2L/m<sup>2</sup>

EA1™ consumption: 12000 L

##### DAY 7 – 1<sup>st</sup> maintenance:

% rate: 50% EA1™

Dosage: 2L/m<sup>2</sup>

EA1™ consumption: 6000 L

##### DAY 14 – 2<sup>nd</sup> maintenance:

% rate: 33% EA1™

Dosage: 2L/m<sup>2</sup>

EA1™ consumption: 4000 L

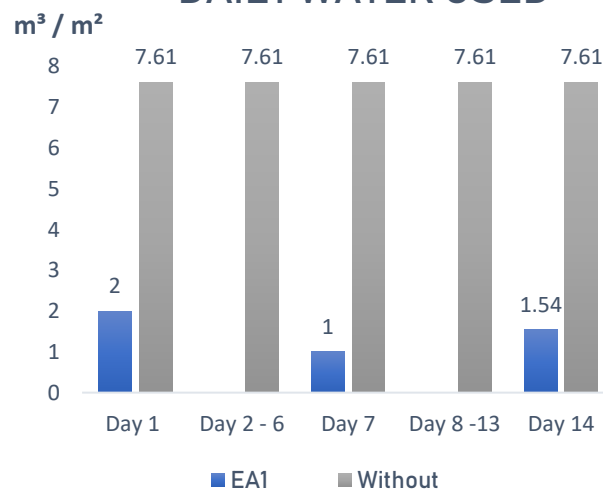
### RESULTS



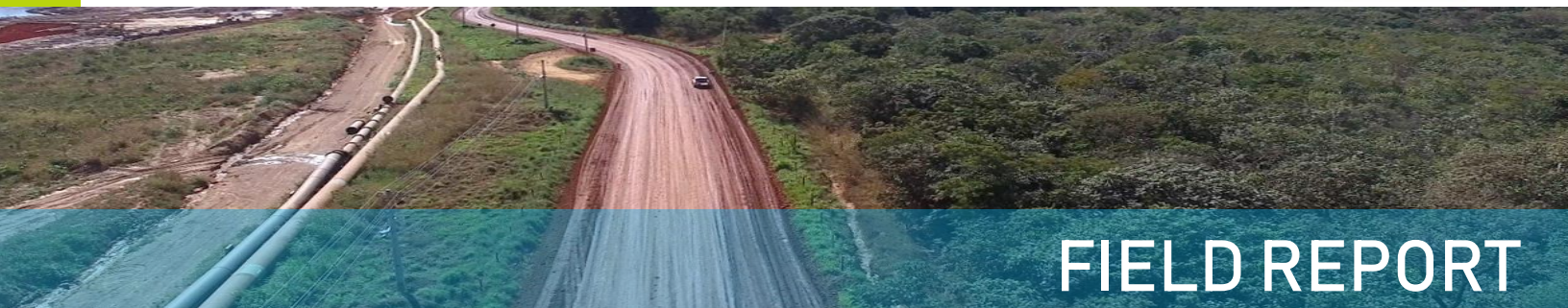
On average, dust emissions decreased by 93% with EA1™

Regarding water consumption, a resulting decrease of 97%, going from spraying water at a rate of 8 liters per square meters every day, to applying, on average, 1.5 liters per square meter each 7 days.

#### DAILY WATER USED







## FIELD REPORT

### TEST DETAILS

<b>Country and region:</b>	Dominican Republic, Azua Province	<b>Average temperature:</b>	Strong heat. Avg. 27.6°C
<b>Type of soil:</b>	80% fine gravel, 20% soil dust, plus a small percentage of cement	<b>Air relative humidity:</b>	Tropical Humid: Average 70%
<b>Type of traffic:</b>	Intense and varied, heavy mining machinery, light trucks, semi-trailers and regular vehicles	<b>Test weather conditions:</b>	Very rainy, humid and warm. There was a very heavy downpour after the first application.
<b>Test zone area:</b>	Total area: 4600 m <sup>2</sup>	<b>Dust Measurement Tool:</b>	DustTrak DRX 8533

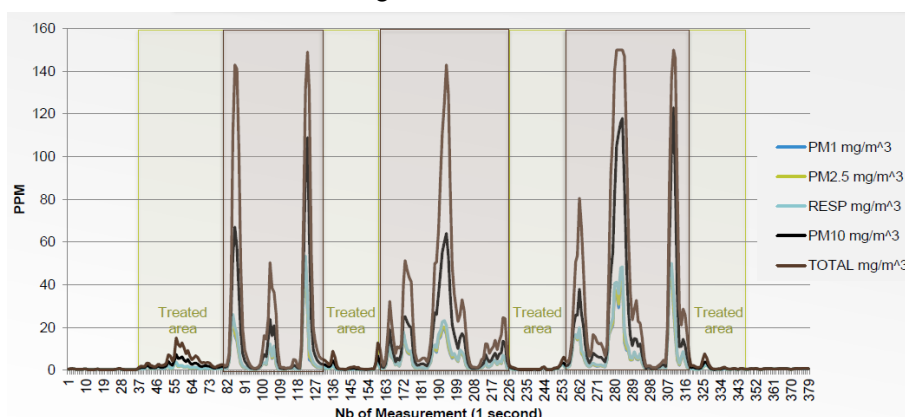
#### Application timeline:

<b>DAY 1</b> - 1 <sup>st</sup> application: % rate: 100% EA1 <sup>TM</sup> Dosage: 2L/m <sup>2</sup> EA1 <sup>TM</sup> consumption: 9200 L	<b>DAY 5</b> – 1 <sup>st</sup> maintenance: % rate: 50% EA1 <sup>TM</sup> Dosage: 2L/m <sup>2</sup> EA1 <sup>TM</sup> consumption: 4600 L	<b>DAY 12</b> – 2 <sup>nd</sup> maintenance: % rate: 25% EA1 <sup>TM</sup> Dosage: 2L/m <sup>2</sup> EA1 <sup>TM</sup> consumption: 2300 L	<b>DAY 19</b> – 3 <sup>rd</sup> maintenance: % rate: 25% EA1 <sup>TM</sup> Dosage: 2L/m <sup>2</sup> EA1 <sup>TM</sup> consumption: 2300 L
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### RESULTS

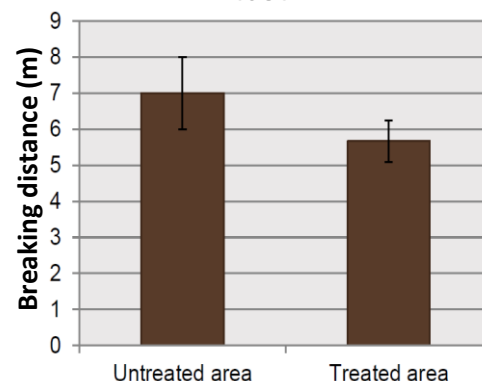
There was a violent rainfall several hours after the first application was performed. Nonetheless, the product was not wiped away by the rain and remained within the roadbed. Therefore, the performance of EA1 was not affected by this climatic event.

#### Dust monitoring: treated vs. untreated area



**Image1:** Dust was reduced in 95%, going from an average of 32ppm in semi-humid conditions to an average of 1.7 ppm in treated areas.

#### Adherence level – Breaking test



**Image 2:** With EA1, the road adherence increased, taking a shorter distance in meters for a truck to come to a full stop.



## FIELD REPORT

### TEST DETAILS

<b>Country/region:</b>	South of France	<b>Average temperature:</b>	Temperate climate / Annual average of 21°C with seasonal variations (July is the warmest month and January is the coldest)
<b>Type of soil:</b>	Tailings Dam. Bauxite and sodium residues with clay-like surface	<b>Type of traffic:</b>	No traffic whatsoever
<b>Test zone area:</b>	Total area: 2,000 m <sup>2</sup>	<b>Measurement Method:</b>	After dusting off the surface, the upper crust's thickness was measured. A Clegg Impact Soil Tester was used to measure the ground surface's resistance to perforation.

#### Application timeline:

##### DAY 1 - 1<sup>st</sup> application:

Dosage: 0.25 L/m<sup>2</sup>

EA1™ consumption: 500 L

##### DAY 40 –

The basin was visually stable after 40 days following the first application.

##### DAY 112 –

The basin was visually stable. Clegg compaction tester used to evaluate compaction level

### RESULTS

After randomly performing 20 measurements with the Clegg compaction tester on different spots of the basin's surface divided into:

- **Non-compacted area:** zone without any type of treatment
- **Compacted but non-treated area:** zone surrounding the treated area
- **EA1™ Treated area:** zone that received treatment with EA1™

After almost 4 months of treatment, the EA1™ presents a bio stabilizing action, effectively controlling dust.

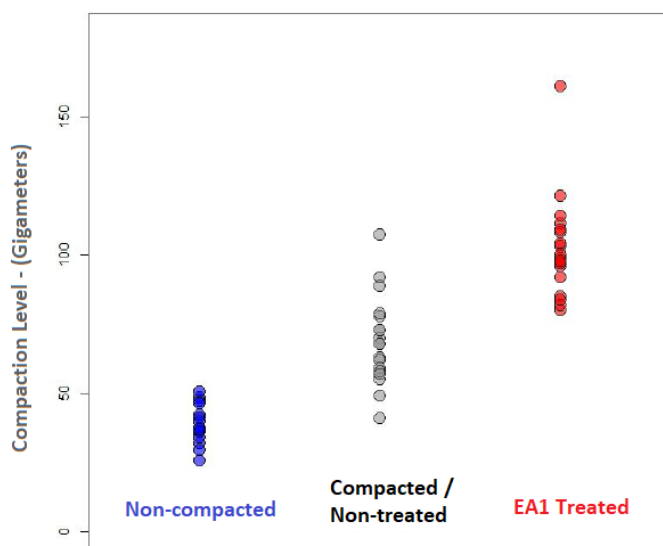


Image 1: Clegg compaction tester results

### CONCLUSION

1 single application of EA1™ at 0.25 L/m<sup>2</sup> allows dust control for 4 months on a tailings dam without any traffic.

## FIELD REPORT

### PARAMETERS

<b>Country/region:</b>	Southern Quebec, Canada	<b>Climate type:</b>	Tempered climate. Hot and relatively wet in Summer, cold in Winter
<b>Type of soil:</b>	0-3/4 type granular material, presence of fine dust at the surface	<b>Type of traffic:</b>	Area used as parking lot for semis and as a storage area for pallets
<b>Test zone:</b>	Total area: 1,160 m <sup>2</sup>	<b>Measuring methodology:</b>	Visual evaluation of emissions

### Application calendar

#### DAY 1 – 1<sup>st</sup> application:

Dosage: 0.8 L/m<sup>2</sup>

EA1<sup>TM</sup> Consumption: 960 L

#### DAY 15

Product still controls dust after 15 days

EA1<sup>TM</sup> Consumption: 0 L

#### DAY 30

Product still controls dust after 30 days

EA1<sup>TM</sup> Consumption: 0 L

### RESULTS

The product was applied without any soil preparation. A dose of 0.8 L/m<sup>2</sup> was applied directly on the surface (0-3/4 gravel, medium-intensity traffic).

During the month in which the test occurred, there was abundant rain and it did not affect the product's efficacy. EA1 was not washed away by rain.

The dust control effect was assessed visually. EA1 allowed to greatly reduce dust emissions during 30 days with only one application.



Image 1: EA1 application with pump and spray bar

### CONCLUSION

1 single application of EA1<sup>TM</sup> at a 0,8 L/m<sup>2</sup> rate allowed to control dust emissions during 1 full month on a gravel parking lot used by heavy vehicles.

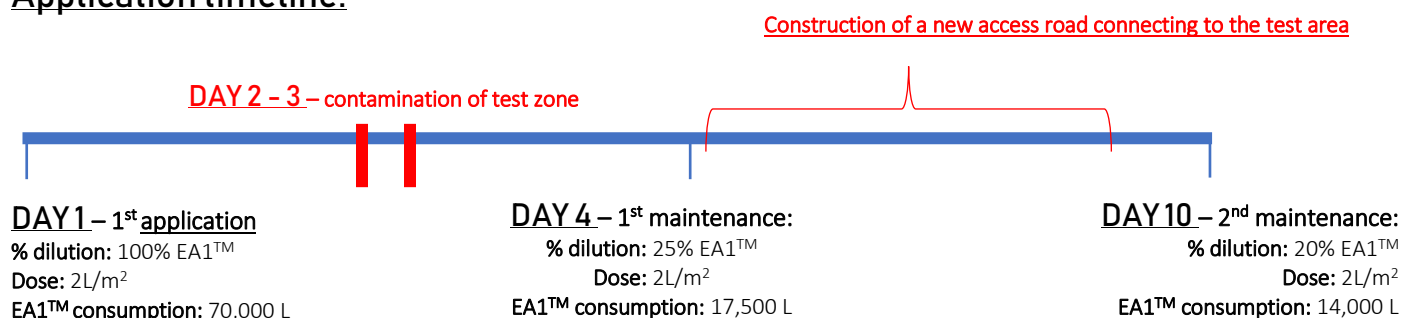


## FIELD REPORT

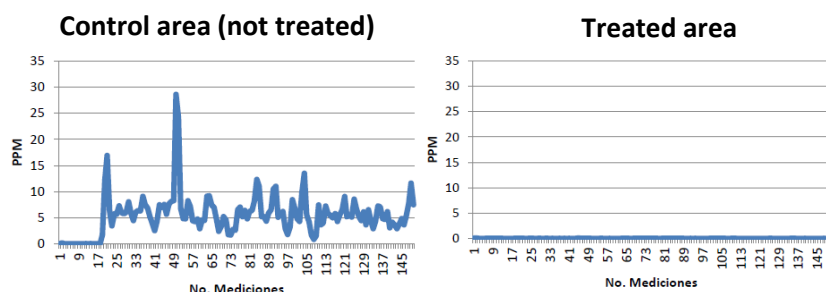
### TEST DETAILS

<b>Country/region:</b>	Peru, Moquegua region	<b>Average temperature:</b>	Fresh: 15°C
<b>Type of soil:</b>	50% gravel, 50% fine material – High amount of fine material	<b>Humidity:</b>	Very dry. Almost no precipitation, desert climate.
<b>Type of traffic:</b>	High intensity. Heavy mining equipment	<b>Weather during test:</b>	Dry and sunny, hot during the day and fresh during the night
<b>Test zone area:</b>	Total area: 35,000 m <sup>2</sup>	<b>Dust measurement device:</b>	DustTrak DRX 8533
<b>Challenges:</b>	<ul style="list-style-type: none"> <li>Following an unintentional intervention of the mine, a significant amount of granular material was deposited on the test zone a few days after the product application.</li> <li>During the test, a new access road was built in the immediate vicinity of the test zone, which created additional contamination to the test zone with airborne dust.</li> </ul> <p><i>Following these events, it became necessary to reduce the intervals between the applications to 1 every 4 days from 1 every 7 days. Additionally, it was decided to perform a daily application of water on the test zone. Since EA1 can absorb moisture, it improved its performance and allowed important savings in water consumption in comparison with the 16 daily applications the mine normally does on this section of the haul road.</i></p>		

### Application timeline:



### RESULTS



Despite the event that affected the fulfillment of the test, it was possible to obtain a **99% decrease** of dust emissions. Water consumption for dust control decreased from 16 applications per day (24h) to only 2. This represents an **82% reduction** in water use.



## FIELD REPORT

### TEST DETAILS

<b>Country/region:</b>	Canada, North of Quebec	<b>Average temperature:</b>	Cold: Avg. 5°C
<b>Type of soil:</b>	Approximately 85% gravel and rocks of different sizes and 15% of fine ones. Presence of large rocks.	<b>Air relative humidity:</b>	Humid: Avg. 70%
<b>Type of traffic:</b>	Heavy traffic	<b>Test weather conditions:</b>	During the totality of the test there were 8 rainy days, 3 after the 1 <sup>st</sup> application and 5 after the maintenance application
<b>Test zone area:</b>	Total area: 1600 m <sup>2</sup> -	<b>Dust Measurement Tool:</b>	DustTrack
<b>Challenges</b>	<i>The site is made mostly of waste material from the former operation. The very specific characteristics of fine material, along with the presence of numerous large rocks and heavy compaction made it the most challenging road conditions ever experienced for an EA1™ application.</i>		

#### Application timeline:

#### DAY 1 - 1<sup>st</sup> application:

% rate: 100% EA1™

Dosage: 2L/m<sup>2</sup>

EA1™ consumption: 3200 L

#### DAY 5 – 1<sup>st</sup> maintenance:

% rate: 25% EA1™

Dosage: 2L/m<sup>2</sup>

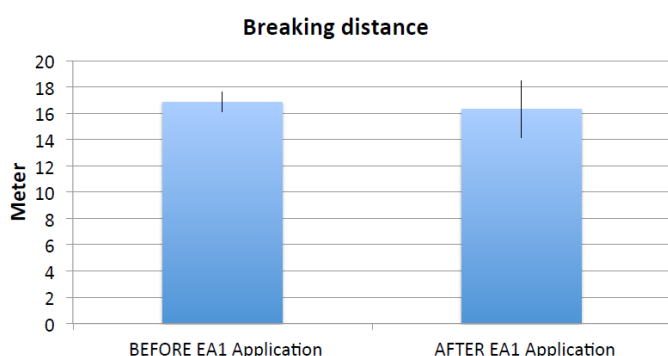
EA1™ consumption: 800 L

#### DAY 16 –

The road remained dust-free after the first maintenance

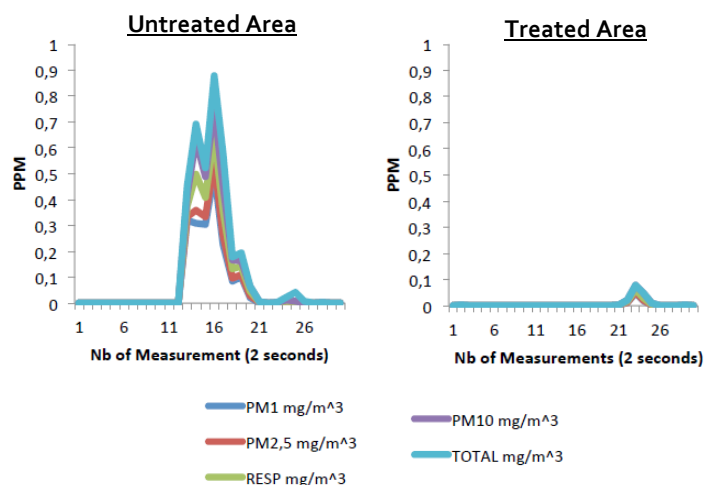
### RESULTS

#### Adhesion & Breaking Test



EA1™ does not have any adverse effect on adhesion. Therefore, the road is not slippery and there is no negative impact of using the EA1™ on operational safety.

#### Dust Monitoring



The dust emissions on the treated area after EA1™ treatment were on average of 0.027 PPM, which is 96% lower than the average value measured for the untreated area (under wet conditions) of 0.692 PPM.