

# Foam Dust Suppression System

Nick Murray

# Biography



Nick Murray has worked in the technology sector for 35 years. He originally trained in electronics and eventually moved on to sales, marketing and key account management roles.

During this time, he has been involved in various areas of the industry including communications, safety, manufacture and most pertinently, mining. These roles in his career have afforded him the opportunity to travel extensively throughout Africa, Europe and the USA.

Amongst other projects, he has been involved in the development of the dust monitoring and suppression solutions which will be discussed in his presentation today.

He is currently a Key Account Manager for Monitech.



**MONITECH**  
MINING MONITORING SYSTEMS

# MINE DUST CONFERENCE

## 21 JUNE 2024



MINING INDUSTRY  
OCCUPATIONAL  
SAFETY & HEALTH



**MINERALS COUNCIL**  
SOUTH AFRICA

# INTRODUCTION

- **MONITECH IS AN ESTABLISHED AND RESPECTED LEADER SPECIALISING IN SAFETY AND MONITORING EQUIPMENT TO THE AFRICAN AND AMERICAN MINING SECTORS.**
- **SINCE 1995, WE HAVE BEEN AT THE FOREFRONT OF TECHNOLOGICAL INNOVATION FOR MINE SAFETY EQUIPMENT, MACHINE AND ENVIRONMENTAL MONITORING.**
- **BY PROACTIVELY ENSURING SAFETY OF PERSONNEL AND THE WORKING CONDITIONS IN WHICH THEY OPERATE, PRODUCTION IS NOT COMPROMISED, DIRECTLY AFFECTING THE BOTTOM LINE.**





**MINERALS COUNCIL**  
SOUTH AFRICA

# MCSA – MINE DUST CONFERENCE

## AGENDA

- ZERO HARM \*
- HOLISTIC DUST MANAGEMENT AND SUPPRESSION
- EQUIPMENT
- APPLICATION POINTS
- KEY FINDINGS





# A COMMON MANDATE: ZERO HARM





# ZERO HARM\*

**STOP  
DUST**

## \*Zero Harm

The Mine Health and Safety Council (MHSC), as per the mandate of the Mine Health and Safety Act of 1996 as amended, decreed at the 2014 Occupational Health and Safety Summit Milestones, that 'by December 2024, 95% of all exposure measurement results will be below the milestone level for respirable crystalline silica of 0.05 mg/m<sup>3</sup> (these results are individual readings and not average results) and using present diagnostic techniques, no new cases of silicosis will occur amongst previously unexposed individuals'.

Source: MINING INDUSTRY OCCUPATIONAL SAFETY & HEALTH (MOSH) - MOSH DUST LEADING PRACTICES COMPENDIUM September 2020

**30+**  
REDUCTION IN  
DUST



# COAL DUST MILESTONE –2024

## A COMMON MANDATE



### \*Zero Harm

The Mine Health and Safety Council (MHSC), as per the mandate of the Mine Health and Safety Act of 1996 as amended, decreed at the 2014 Occupational Health and Safety Summit Milestones, that 'by December 2024, 95% of all exposure measurement results will be below the milestone level for respirable crystalline silica of 0.05 mg/m<sup>3</sup> (these results are individual readings and not average results) and using present diagnostic techniques, no new cases of silicosis will occur amongst previously unexposed individuals'.

Source: MINING INDUSTRY OCCUPATIONAL SAFETY & HEALTH (MOSH) – MOSH DUST LEADING PRACTICES COMPENDIUM September 2020





# COAL DUST MILESTONE –2024

## A COMMON MANDATE

DUST SUPPRESSION, REAL-TIME DUST MEASUREMENTS AND WATER MANAGEMENT IS AN ONGOING CHALLENGE IN THE MINING ENVIRONMENT.

OUTDATED SYSTEMS AND PROCEDURES CURRENTLY CAN HAVE A HIGH COST OF MAINTENANCE AND A LOW LEVEL OF RELIABILITY THAT CAN CONTRIBUTE TO DIFFICULTIES IN CONTROLLING OPERATIONAL WATER USAGE AND DUST LEVELS.

MONITECH INNOVATES WITHIN THIS SPACE TO DESIGN ALTERNATIVE SOLUTIONS RELEVANT TO THE MINING INDUSTRY.



# HOLISTIC APPROACH – DUST AND WATER 360



A HOLISTIC APPROACH WITH COMPREHENSIVE SOLUTIONS FOR THE PRODUCTION AND TRANSPORTATION OF COAL/ORE.

STARTING FROM THE INITIAL CREATION OF HAZARDOUS DUST, THE APPLICATIONS PROVIDE SOLUTIONS FROM:

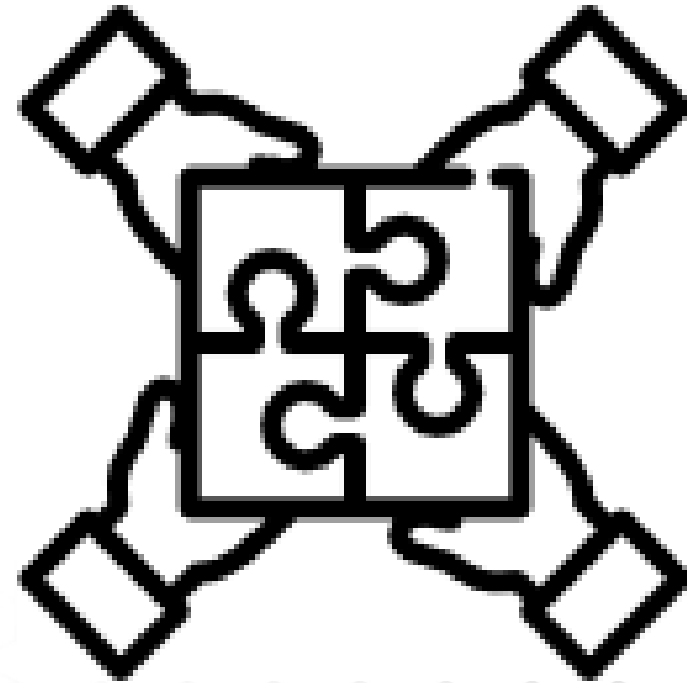
- THE WORKING FACE ON THE CONTINUOUS MINER (CM),
- AT THE FEEDER BREAKERS (FB)
- TO THE DOWNSTREAM DUST GENERATING FROM TRANSFER POINTS (TP) TO THE BUNKER.

# SOLUTION PARTNERS

FOR OVER SIX YEARS MONITECH HAS  
PARTNERED WITH

- MOSH DUST
- SERITI
- SASOL
- THUNGELA
- BLUE MINING

THESE PARTNERSHIPS HAVE IDENTIFIED OPTIMAL  
PLACEMENTS FOR EQUIPMENT TO ADDRESS DUST  
LEVELS AND WATER MANAGEMENT



# EQUIPMENT



## OPTIMAL DUST MANAGEMENT SOLUTION:

- MONITECH REAL-TIME DUST MONITOR,
- MONITECH WATER MANAGEMENT SYSTEMS
- DUST STOP SYSTEM.



THESE SYSTEMS CAN BE INSTALLED AS SURFACE OR UNDERGROUND APPLICATIONS IN HAZARDOUS OR NON-HAZARDOUS OPERATIONS.





# REAL-TIME DUST MONITOR



## MONITECH REAL-TIME DUST MONITOR (MRDM)

THE MONITECH REAL-TIME DUST MONITORING SYSTEM ENABLES MANAGEMENT, MINERS AND OPERATORS TO MONITOR THE DUST GENERATED IN WORKING AREAS IN REAL TIME OR AS SHIFT AVERAGE READINGS.

THE MRDM SYSTEM WAS CRITICAL IN OBTAINING THE DUST READING DURING THE TRIAL STAGES.

**“If you can't measure it, you can't manage it.”**

Peter Drucker



# REAL TIME DUST MONITOR



MONITECH REALTIME DUST MONITOR



MONITECH SMART DUST DISPLAY



# MODULARITY:

## WATER MANAGEMENT SYSTEMS



MONITECH'S WATER FLOW MANAGEMENT SYSTEM PROVIDES INCREMENTAL BENEFITS IN BOTH WATER MANAGEMENT AND DUST SUPPRESSION THROUGHOUT THE MINING OPERATION.

THE DESIGN IS INTEGRATED WITH THE CURRENT DUST SUPPRESSION SYSTEM AS A WATER FLOW MANAGEMENT SOLUTION THAT ENABLES THE USER TO CONTROL AND VIEW THE WATER FLOW IN REAL TIME TO IDENTIFY ANY IMPLICATIONS REGARDING DUST SUPPRESSION.

THE SAME SYSTEM IS USED TO CONTROL THE ACTIVATION OF THE DUST STOP SYSTEM



# DUST STOP SYSTEM



The DUST STOP system uses an AIRLESS DOSING PUMP system to draw a FOAMING AGENT INTO THE WATER SUPPLY which is fed to a custom designed AIRLESS FOAMING NOZZLE.

The foam is sprayed to effectively SUPPRESS DUST BEFORE IT BECOMES AIRBORNE, MINIMISING THE AMOUNT OF DUST inhaled by workers. Dust Stop AIRLESS system eliminates unnecessary hardware to minimise setup and reduce life cycle costs.





# DUST STOP SYSTEM BENEFITS



Environmentally friendly chemicals



Reduce water usage, increases the water volume by 7 times to improve contact area



All site risk management and adoption process is available for implementation



Easy to install for any application and requires very little maintenance



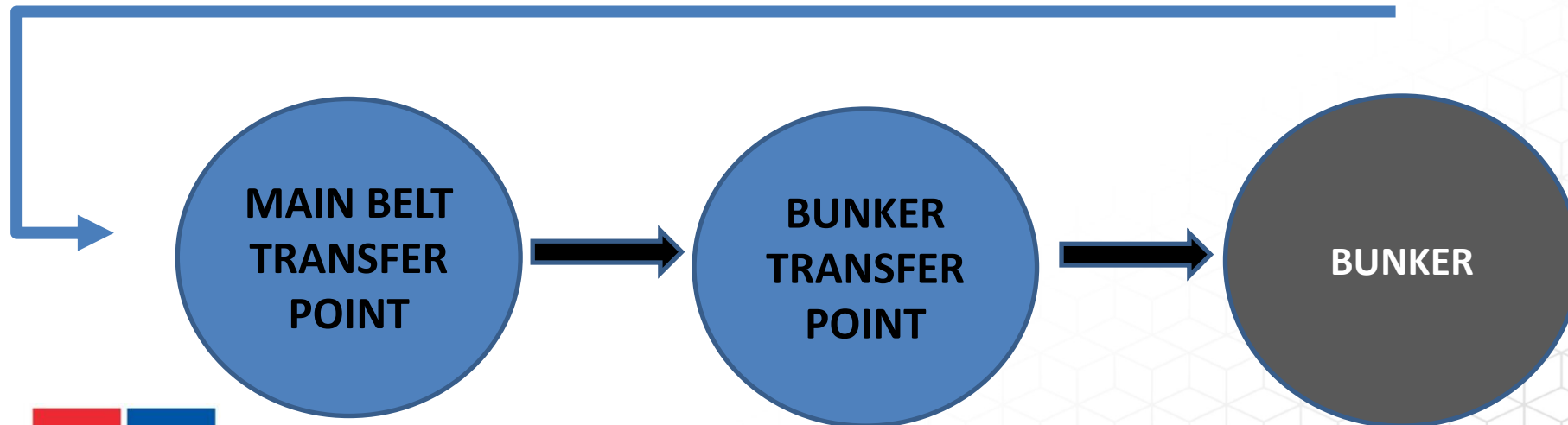
Forms part of whole dust reducing system does not interfere with operations



Reduces water tension, increases contact area & creates blanket effect



# APPLICATION POINTS – HOLISTIC APPROACH



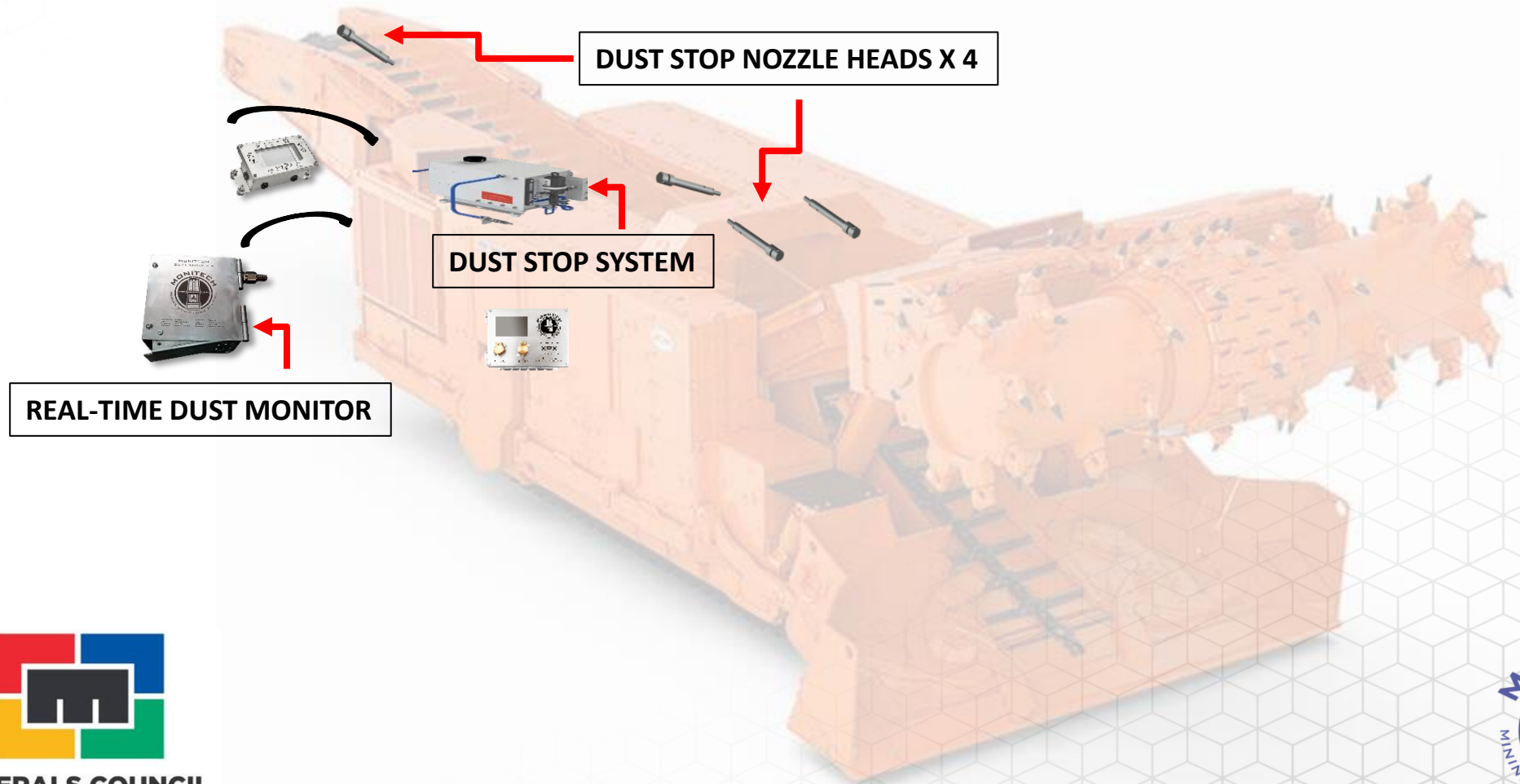


# KEY FINDINGS:

# CONTINUOUS MINER



# APPLICATION POINTS – CONTINUOUS MINER

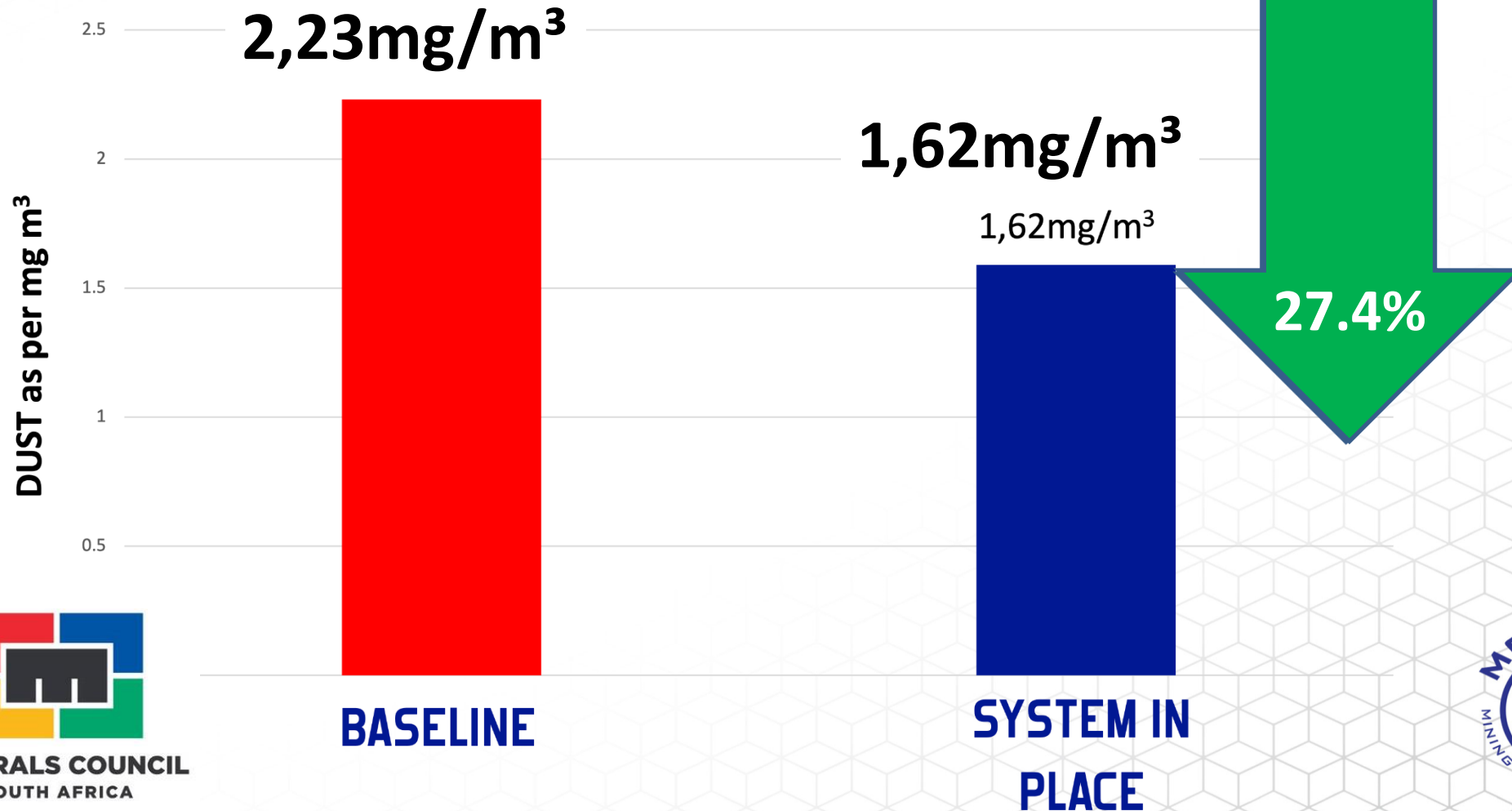




# APPLICATION POINTS – CONTINUOUS MINER



# CONTINUOUS MINER – DUST READINGS



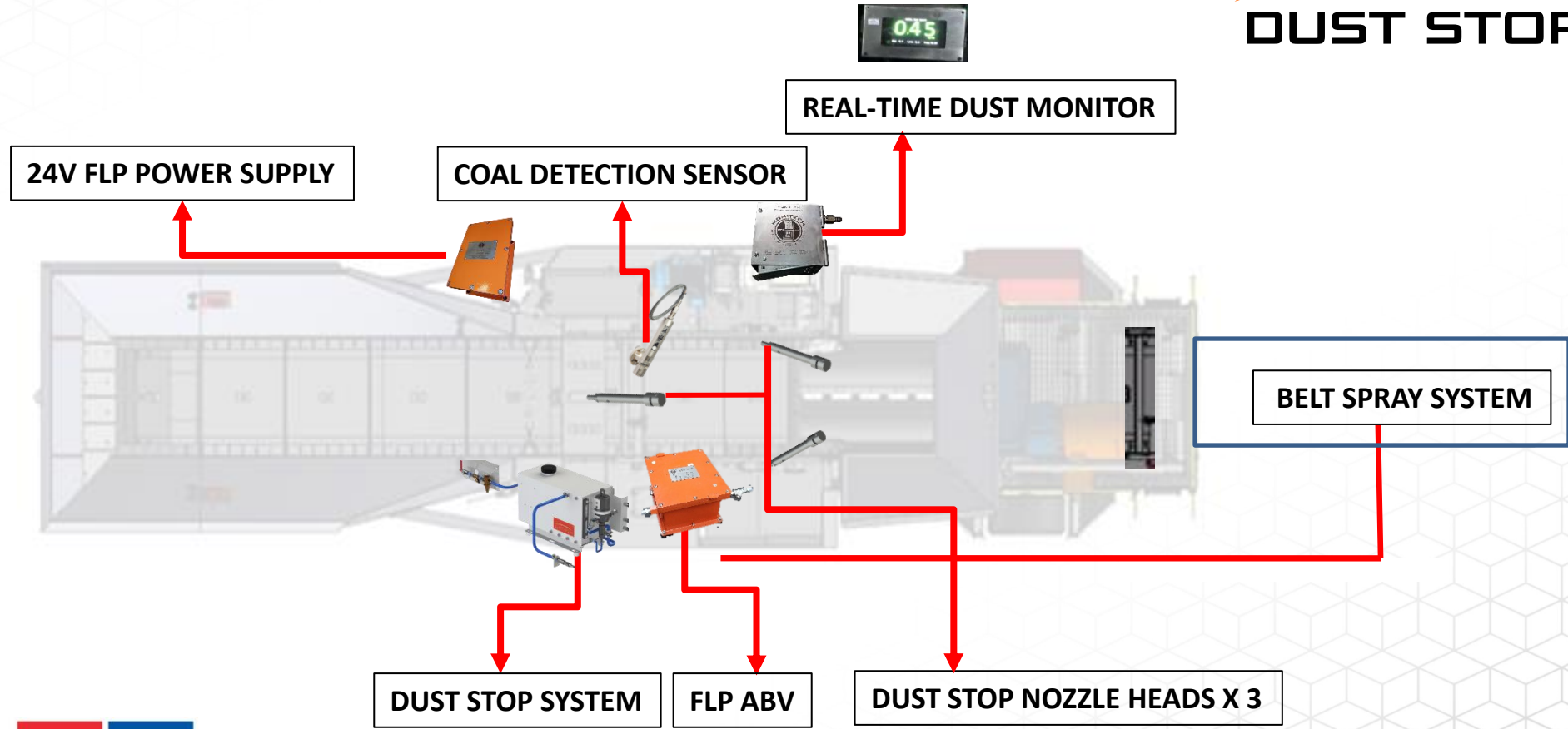


# KEY FINDINGS:

# FEEDER BREAKER



# FEEDER BREAKER PLACEMENT





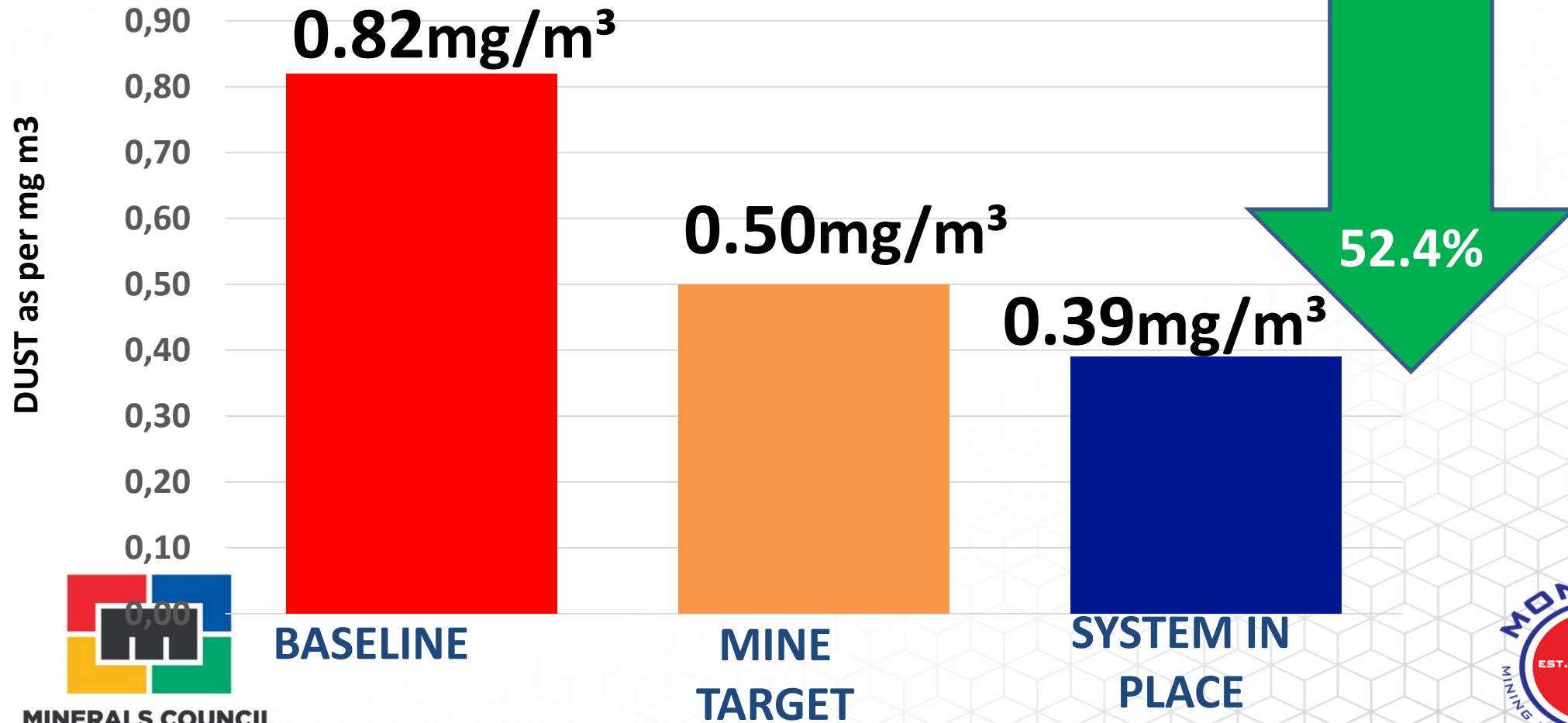


**DUST STOP**

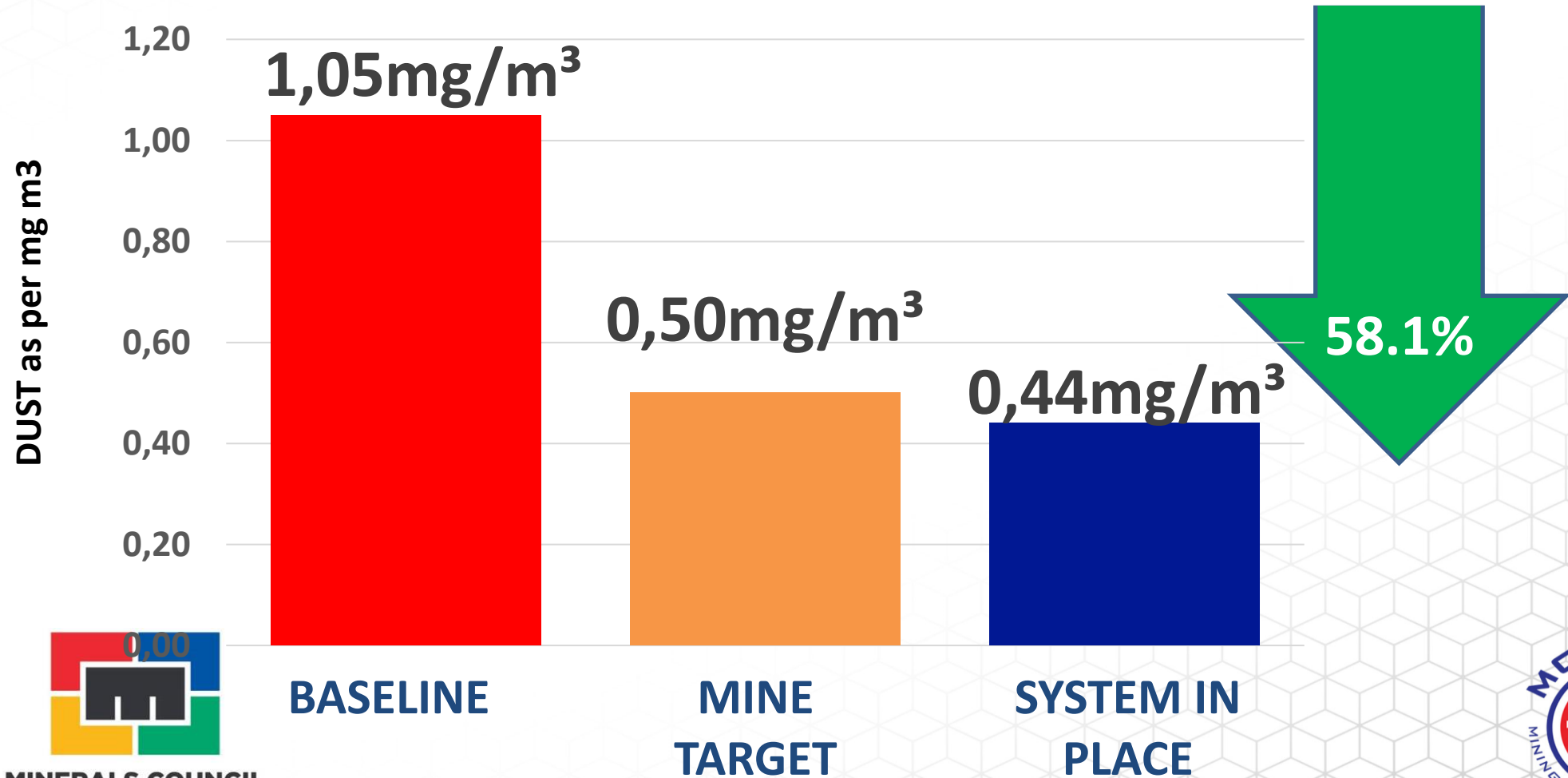
**SYSTEM APPLICATIONS: FEEDER BREAKER**



# FEEDER BREAKER- DUST READINGS AT FB

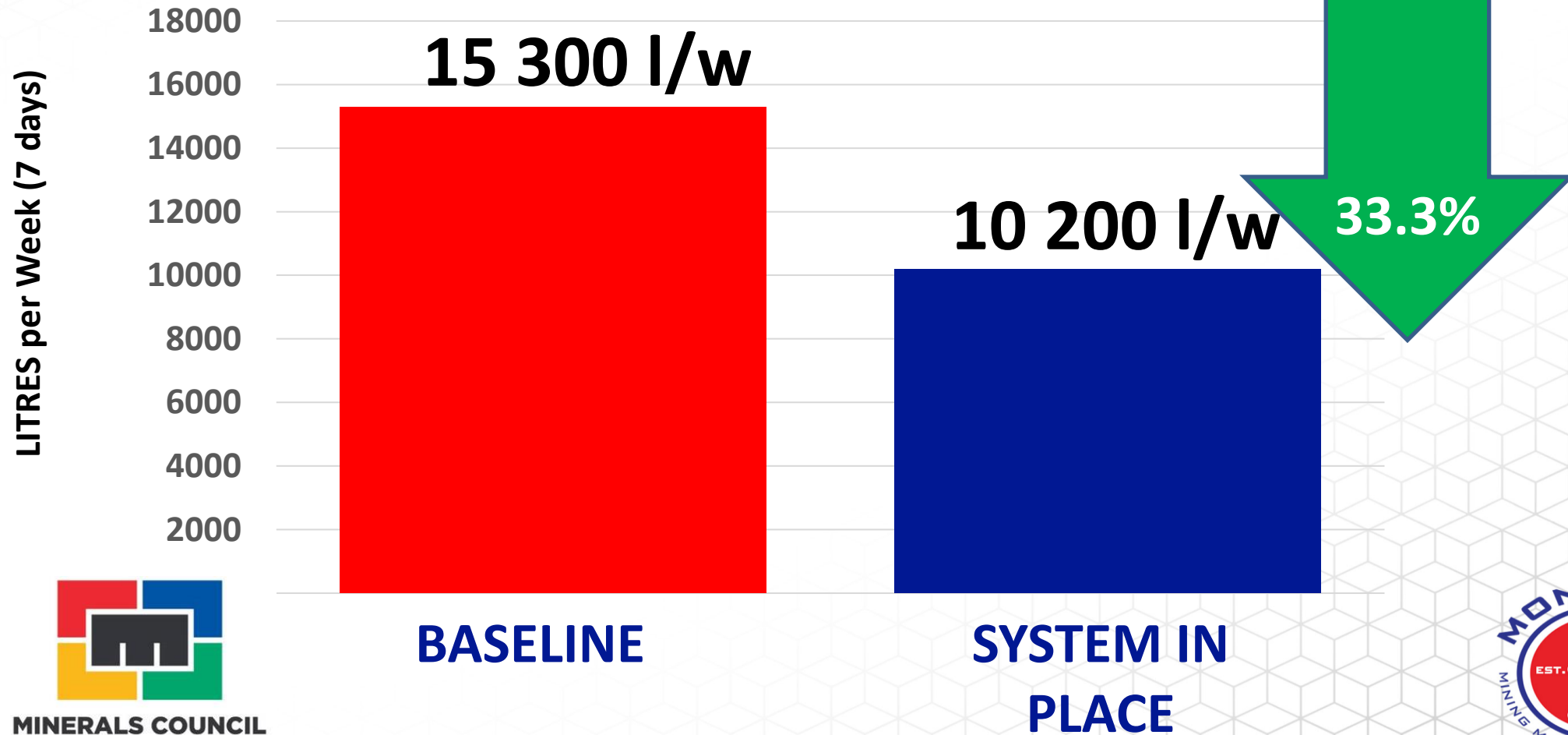


# FEEDER BREAKER- DUST READINGS AT BELT





# FEEDER BREAKER- WATER USAGE



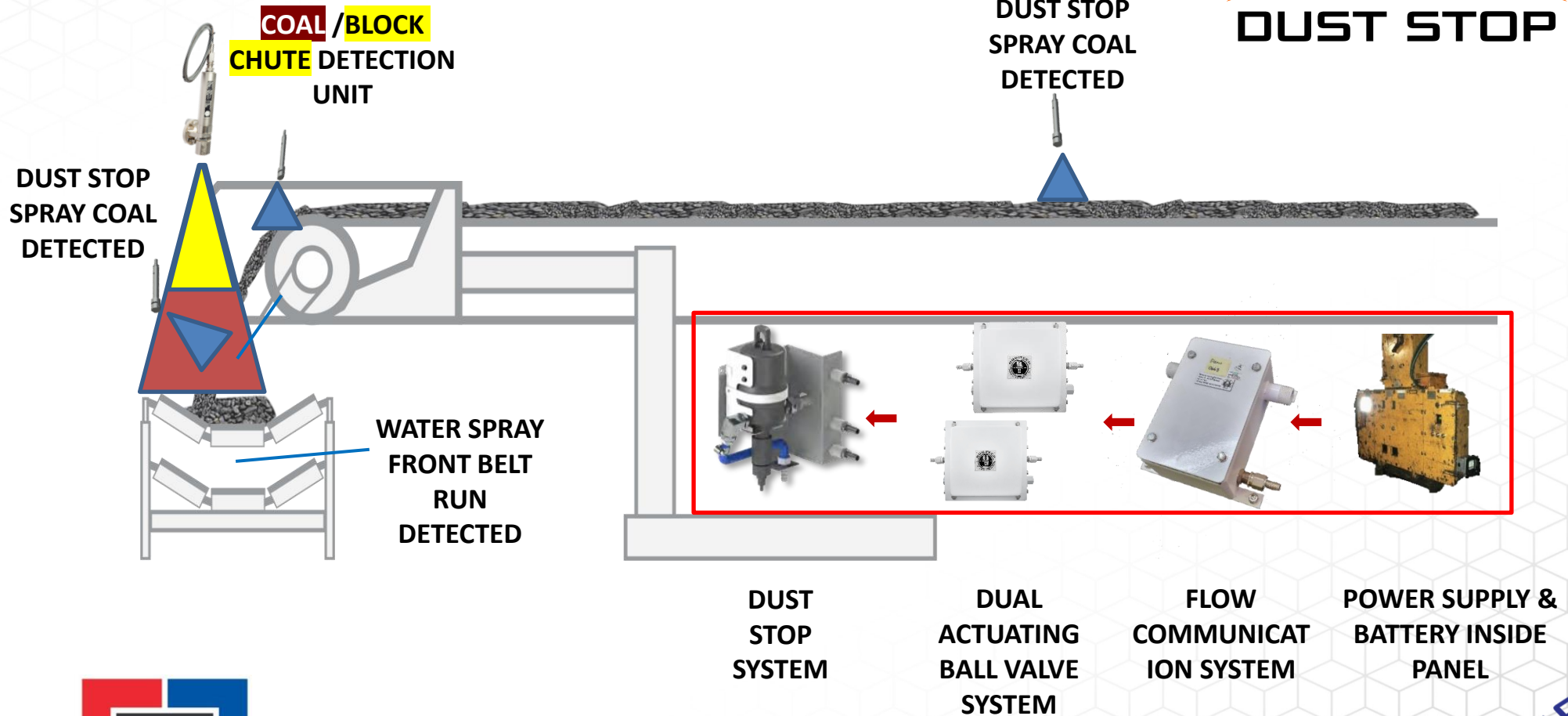


**KEY FINDINGS:**

**TRANSFER POINT**



# TRANSFER POINT PLACEMENT





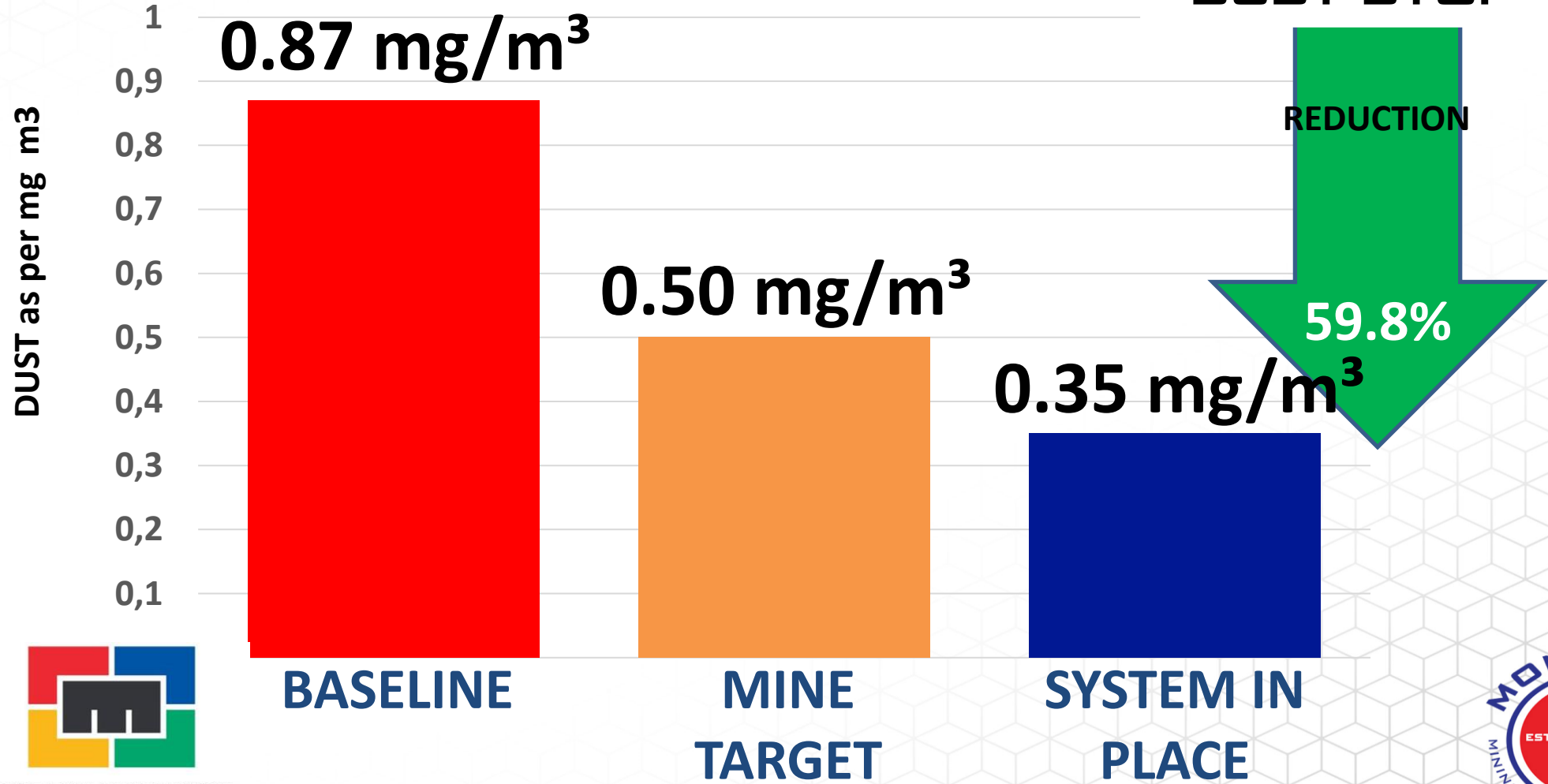
**DUST STOP**

# **SYSTEM APPLICATIONS: TRANSFER POINT**



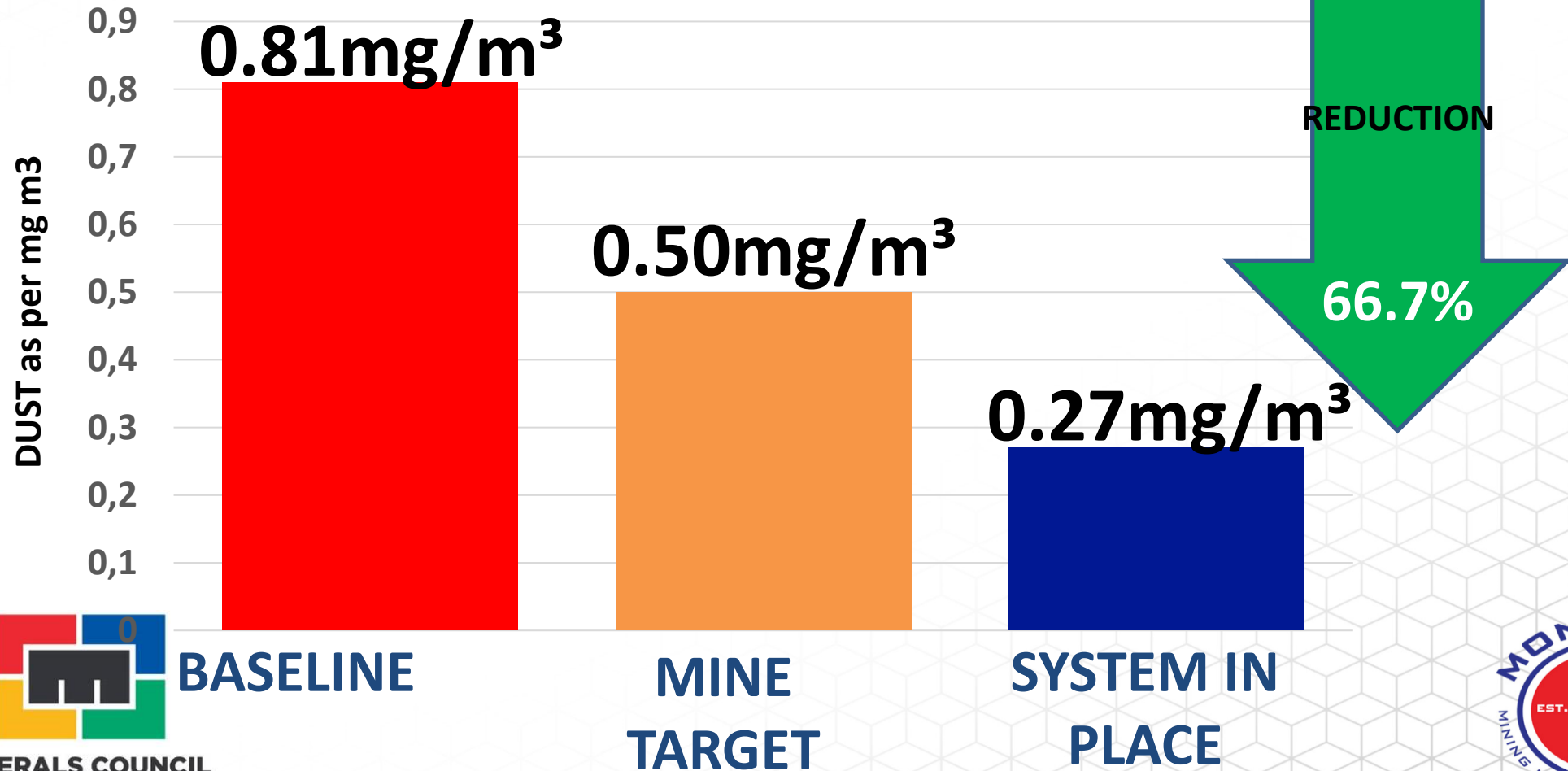


# TRANSFER POINT – DUST READINGS AT BELT 1

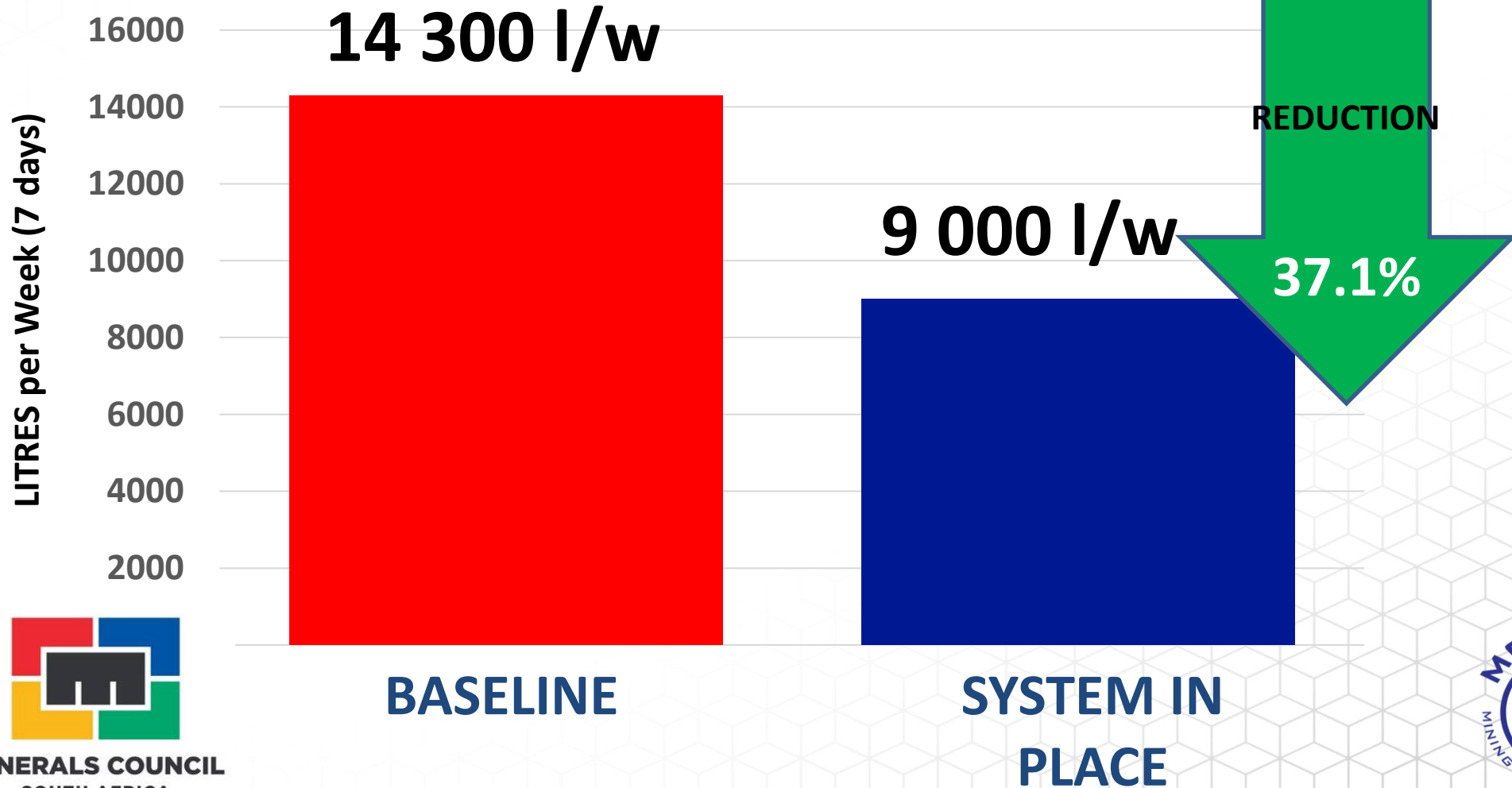




# TRANSFER POINT – DUST READINGS AT BELT 3



# TRANSFER POINT – WATER USAGE

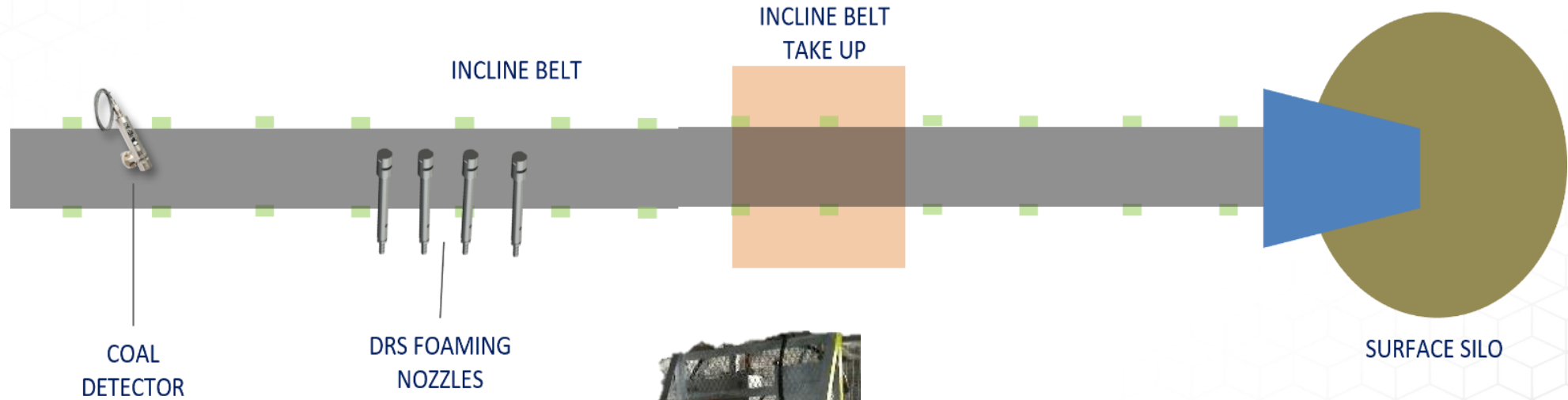


**KEY FINDINGS:**

**SURFACE APPLICATION**



# SURFACE APPLICATION PLACEMENT



COAL  
DETECTOR

DRS FOAMING  
NOZZLES

INCLINE BELT

INCLINE BELT  
TAKE UP

SURFACE SILO



DUST STOP TANK

  
**DUST STOP**





# SURFACE APPLICATION PLACEMENT

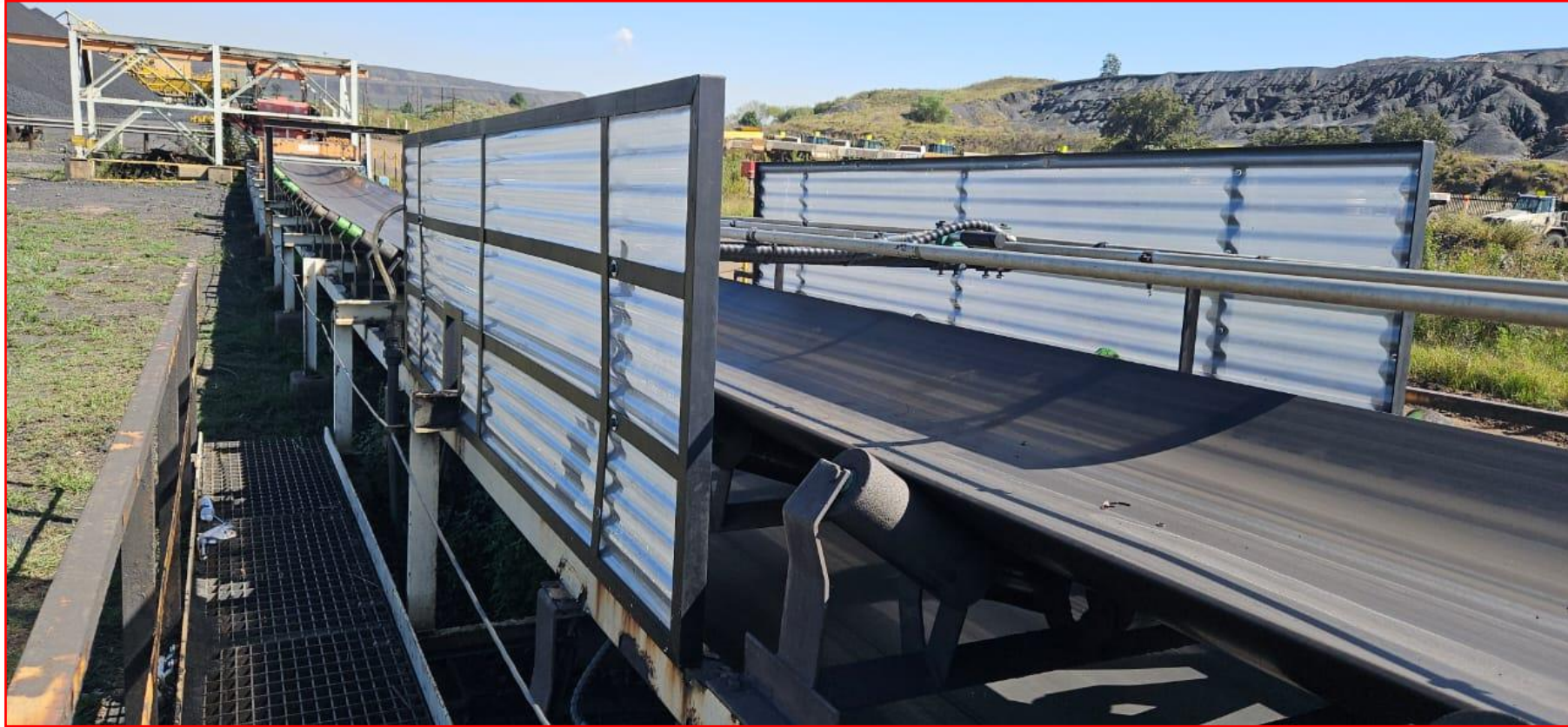


  
**DUST STOP**





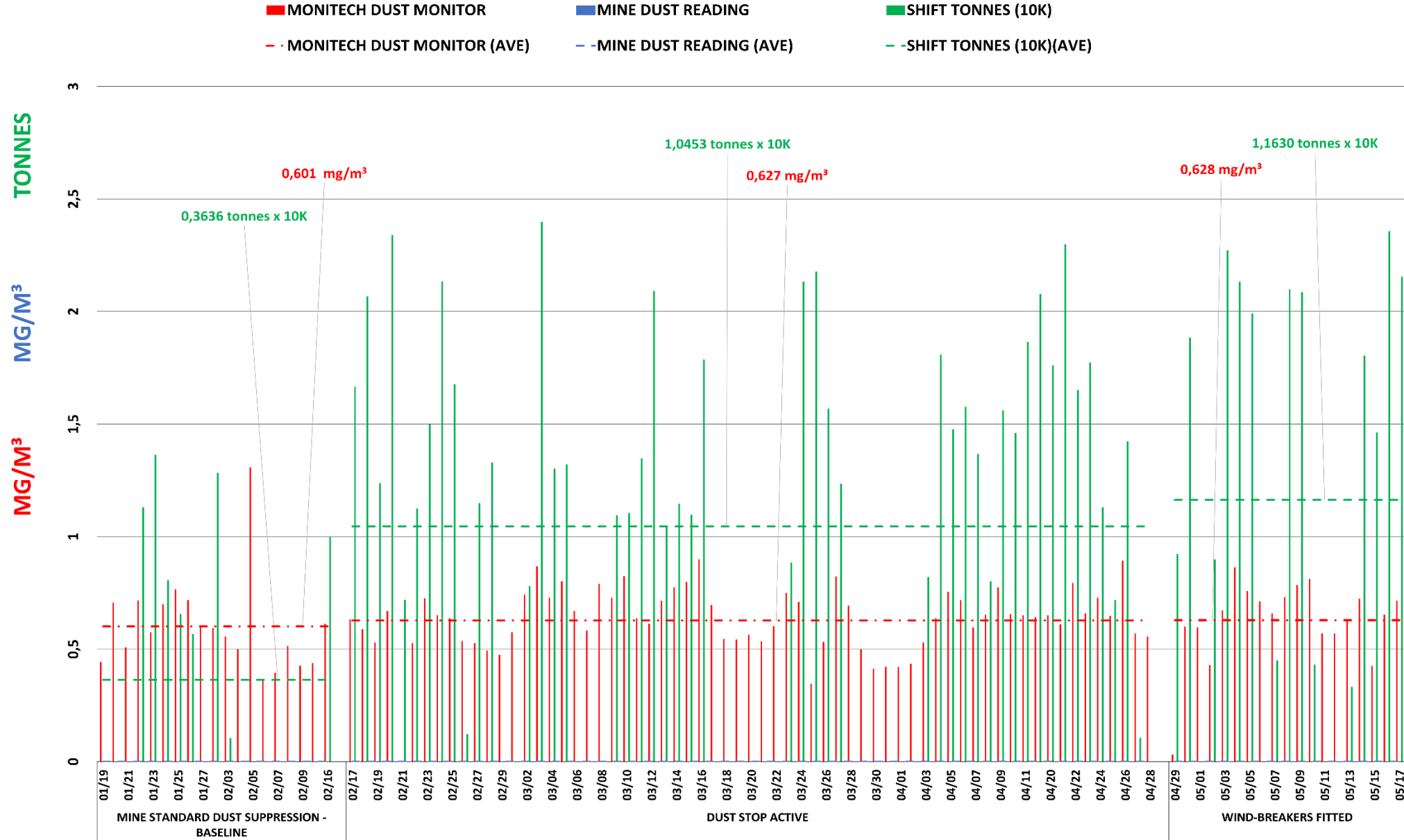
# SURFACE APPLICATION PLACEMENT



  
**DUST STOP**



# THUNGELA - KHWEZELA - NAVIGATION COMPARATIVE DUST vs TONNAGES





**MONITECH**  
MINING MONITORING SYSTEMS

# MINE DUST CONFERENCE

## 21 JUNE 2024



MINING INDUSTRY  
OCCUPATIONAL  
SAFETY & HEALTH



**MINERALS COUNCIL**  
SOUTH AFRICA



# INTRODUCTION

- **MONITECH IS AN ESTABLISHED AND RESPECTED LEADER SPECIALISING IN SAFETY AND MONITORING EQUIPMENT TO THE AFRICAN AND AMERICAN MINING SECTORS.**
- **SINCE 1995, WE HAVE BEEN AT THE FOREFRONT OF TECHNOLOGICAL INNOVATION FOR MINE SAFETY EQUIPMENT, MACHINE AND ENVIRONMENTAL MONITORING.**
- **BY PROACTIVELY ENSURING SAFETY OF PERSONNEL AND THE WORKING CONDITIONS IN WHICH THEY OPERATE, PRODUCTION IS NOT COMPROMISED, DIRECTLY AFFECTING THE BOTTOM LINE.**





**MINERALS COUNCIL**  
SOUTH AFRICA

# MCSA – MINE DUST CONFERENCE

## AGENDA

- ZERO HARM \*
- HOLISTIC DUST MANAGEMENT AND SUPPRESSION
- EQUIPMENT
- APPLICATION POINTS
- KEY FINDINGS





# A COMMON MANDATE: ZERO HARM





# ZERO HARM\*

**STOP  
DUST**

## \*Zero Harm

The Mine Health and Safety Council (MHSC), as per the mandate of the Mine Health and Safety Act of 1996 as amended, decreed at the 2014 Occupational Health and Safety Summit Milestones, that 'by December 2024, 95% of all exposure measurement results will be below the milestone level for respirable crystalline silica of 0.05 mg/m<sup>3</sup> (these results are individual readings and not average results) and using present diagnostic techniques, no new cases of silicosis will occur amongst previously unexposed individuals'.

Source: MINING INDUSTRY OCCUPATIONAL SAFETY & HEALTH (MOSH) - MOSH DUST LEADING PRACTICES COMPENDIUM September 2020

**30+**  
REDUCTION IN  
DUST



# COAL DUST MILESTONE –2024

## A COMMON MANDATE



### \*Zero Harm

The Mine Health and Safety Council (MHSC), as per the mandate of the Mine Health and Safety Act of 1996 as amended, decreed at the 2014 Occupational Health and Safety Summit Milestones, that 'by December 2024, 95% of all exposure measurement results will be below the milestone level for respirable crystalline silica of 0.05 mg/m<sup>3</sup> (these results are individual readings and not average results) and using present diagnostic techniques, no new cases of silicosis will occur amongst previously unexposed individuals'.

Source: MINING INDUSTRY OCCUPATIONAL SAFETY & HEALTH (MOSH) – MOSH DUST LEADING PRACTICES COMPENDIUM September 2020



# COAL DUST MILESTONE –2024

## A COMMON MANDATE

DUST SUPPRESSION, REAL-TIME DUST MEASUREMENTS AND WATER MANAGEMENT IS AN ONGOING CHALLENGE IN THE MINING ENVIRONMENT.

OUTDATED SYSTEMS AND PROCEDURES CURRENTLY CAN HAVE A HIGH COST OF MAINTENANCE AND A LOW LEVEL OF RELIABILITY THAT CAN CONTRIBUTE TO DIFFICULTIES IN CONTROLLING OPERATIONAL WATER USAGE AND DUST LEVELS.

MONITECH INNOVATES WITHIN THIS SPACE TO DESIGN ALTERNATIVE SOLUTIONS RELEVANT TO THE MINING INDUSTRY.



# **HOLISTIC APPROACH – DUST AND WATER 360**



**A HOLISTIC APPROACH WITH COMPREHENSIVE SOLUTIONS FOR THE PRODUCTION AND TRANSPORTATION OF COAL/ORE.**

**STARTING FROM THE INITIAL CREATION OF HAZARDOUS DUST, THE APPLICATIONS PROVIDE SOLUTIONS FROM:**

- THE WORKING FACE ON THE CONTINUOUS MINER (CM),**
- AT THE FEEDER BREAKERS (FB)**
- TO THE DOWNSTREAM DUST GENERATING FROM TRANSFER POINTS (TP) TO THE BUNKER.**

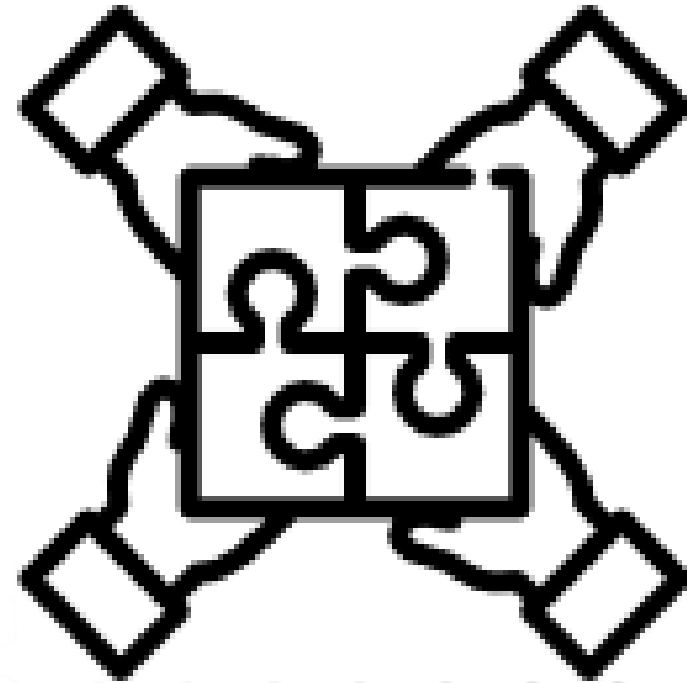


# SOLUTION PARTNERS

FOR OVER SIX YEARS MONITECH HAS  
PARTNERED WITH

- MOSH DUST
- SERITI
- SASOL
- THUNGELA
- BLUE MINING

THESE PARTNERSHIPS HAVE IDENTIFIED OPTIMAL  
PLACEMENTS FOR EQUIPMENT TO ADDRESS DUST  
LEVELS AND WATER MANAGEMENT





# EQUIPMENT



## OPTIMAL DUST MANAGEMENT SOLUTION:

- MONITECH REAL-TIME DUST MONITOR,
- MONITECH WATER MANAGEMENT SYSTEMS
- DUST STOP SYSTEM.



THESE SYSTEMS CAN BE INSTALLED AS SURFACE OR UNDERGROUND APPLICATIONS IN HAZARDOUS OR NON-HAZARDOUS OPERATIONS.



# REAL-TIME DUST MONITOR



## MONITECH REAL-TIME DUST MONITOR (MRDM)

THE MONITECH REAL-TIME DUST MONITORING SYSTEM ENABLES MANAGEMENT, MINERS AND OPERATORS TO MONITOR THE DUST GENERATED IN WORKING AREAS IN REAL TIME OR AS SHIFT AVERAGE READINGS.

THE MRDM SYSTEM WAS CRITICAL IN OBTAINING THE DUST READING DURING THE TRIAL STAGES.

**“If you can't measure it, you can't manage it.”**

Peter Drucker



# REAL TIME DUST MONITOR



MONITECH REALTIME DUST MONITOR



MONITECH SMART DUST DISPLAY



# MODULARITY:

## WATER MANAGEMENT SYSTEMS



MONITECH'S WATER FLOW MANAGEMENT SYSTEM PROVIDES INCREMENTAL BENEFITS IN BOTH WATER MANAGEMENT AND DUST SUPPRESSION THROUGHOUT THE MINING OPERATION.

THE DESIGN IS INTEGRATED WITH THE CURRENT DUST SUPPRESSION SYSTEM AS A WATER FLOW MANAGEMENT SOLUTION THAT ENABLES THE USER TO CONTROL AND VIEW THE WATER FLOW IN REAL TIME TO IDENTIFY ANY IMPLICATIONS REGARDING DUST SUPPRESSION.

THE SAME SYSTEM IS USED TO CONTROL THE ACTIVATION OF THE DUST STOP SYSTEM





# DUST STOP SYSTEM



The DUST STOP system uses an AIRLESS DOSING PUMP system to draw a FOAMING AGENT INTO THE WATER SUPPLY which is fed to a custom designed AIRLESS FOAMING NOZZLE.

The foam is sprayed to effectively SUPPRESS DUST BEFORE IT BECOMES AIRBORNE, MINIMISING THE AMOUNT OF DUST inhaled by workers. Dust Stop AIRLESS system eliminates unnecessary hardware to minimise setup and reduce life cycle costs.

# DUST STOP SYSTEM BENEFITS



Environmentally friendly chemicals



Reduce water usage, increases the water volume by 7 times to improve contact area



All site risk management and adoption process is available for implementation



Easy to install for any application and requires very little maintenance

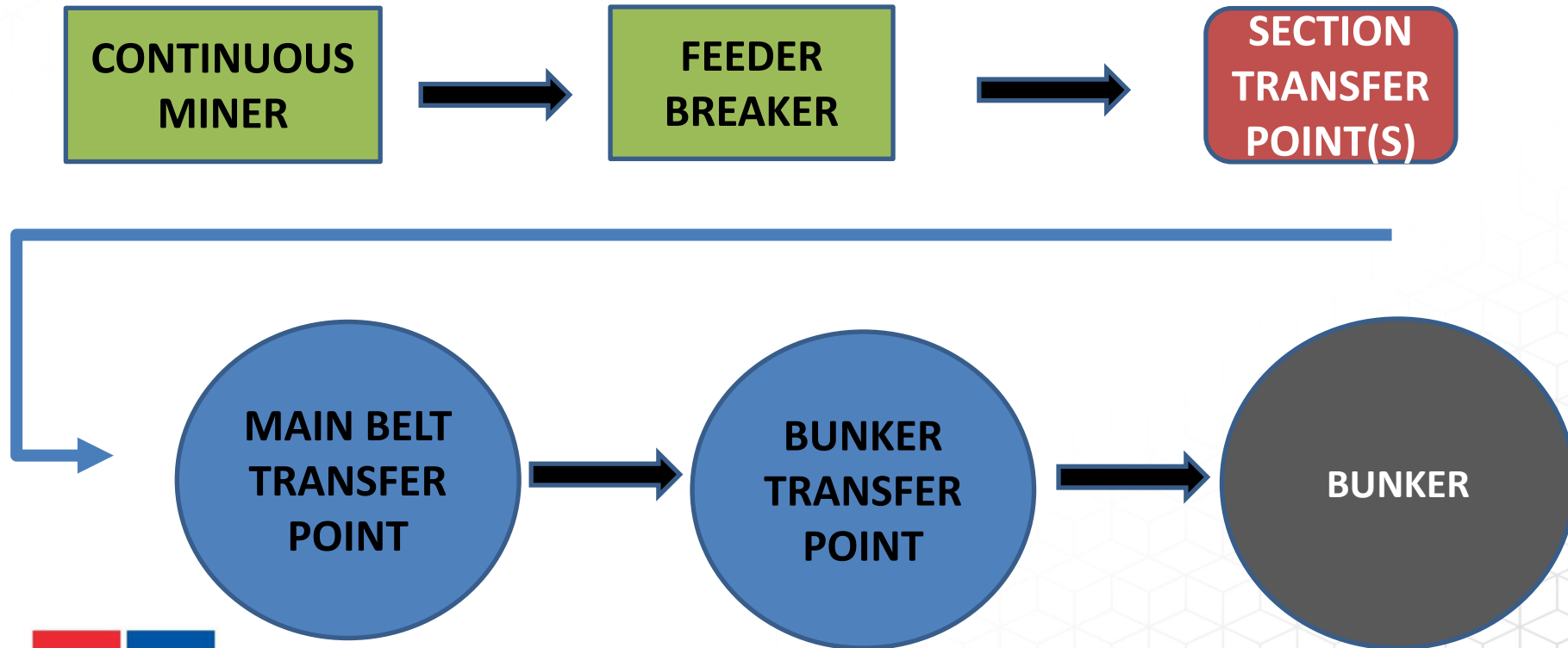


Forms part of whole dust reducing system does not interfere with operations



Reduces water tension, increases contact area & creates blanket effect

# APPLICATION POINTS – HOLISTIC APPROACH





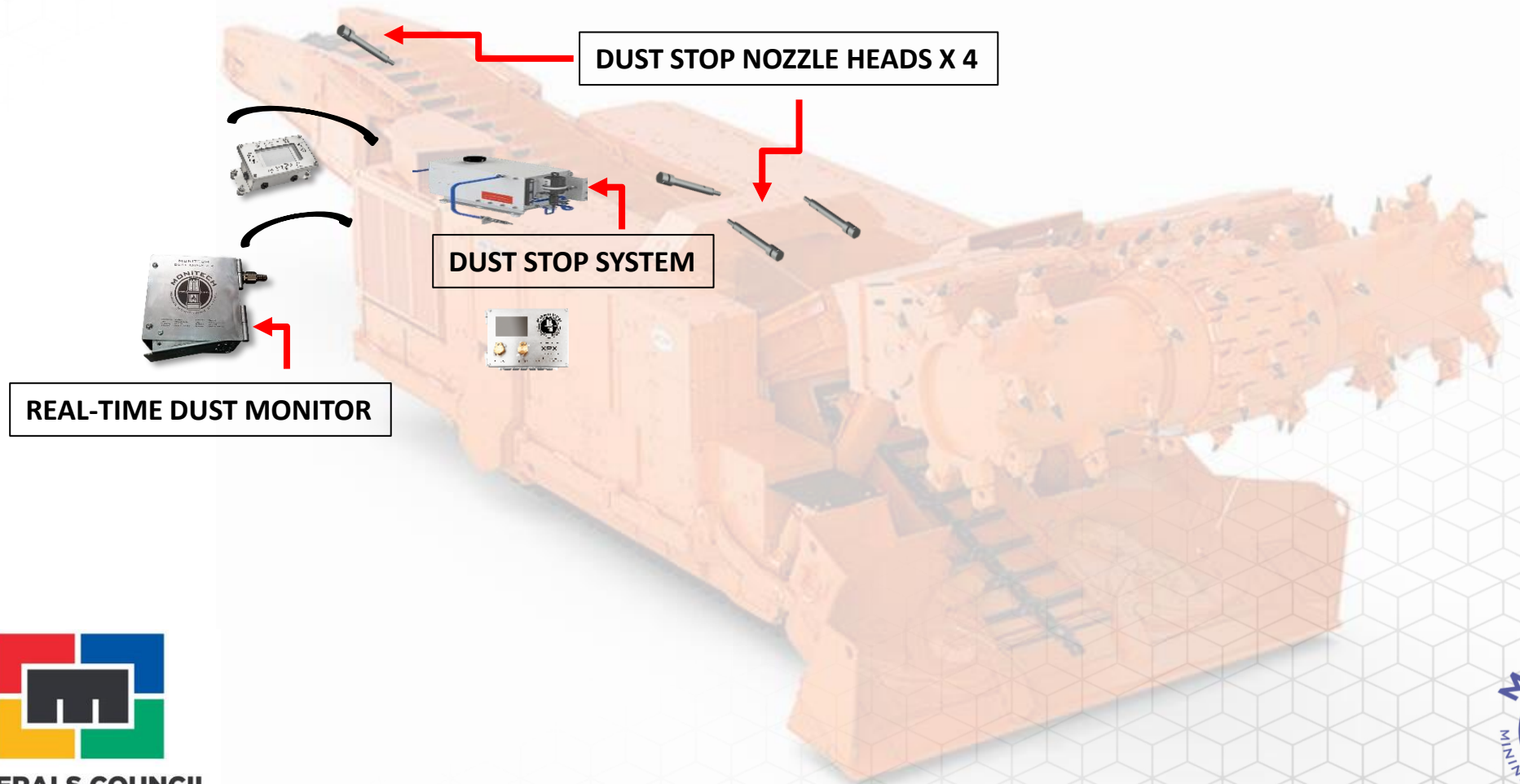
# KEY FINDINGS:

# CONTINUOUS MINER





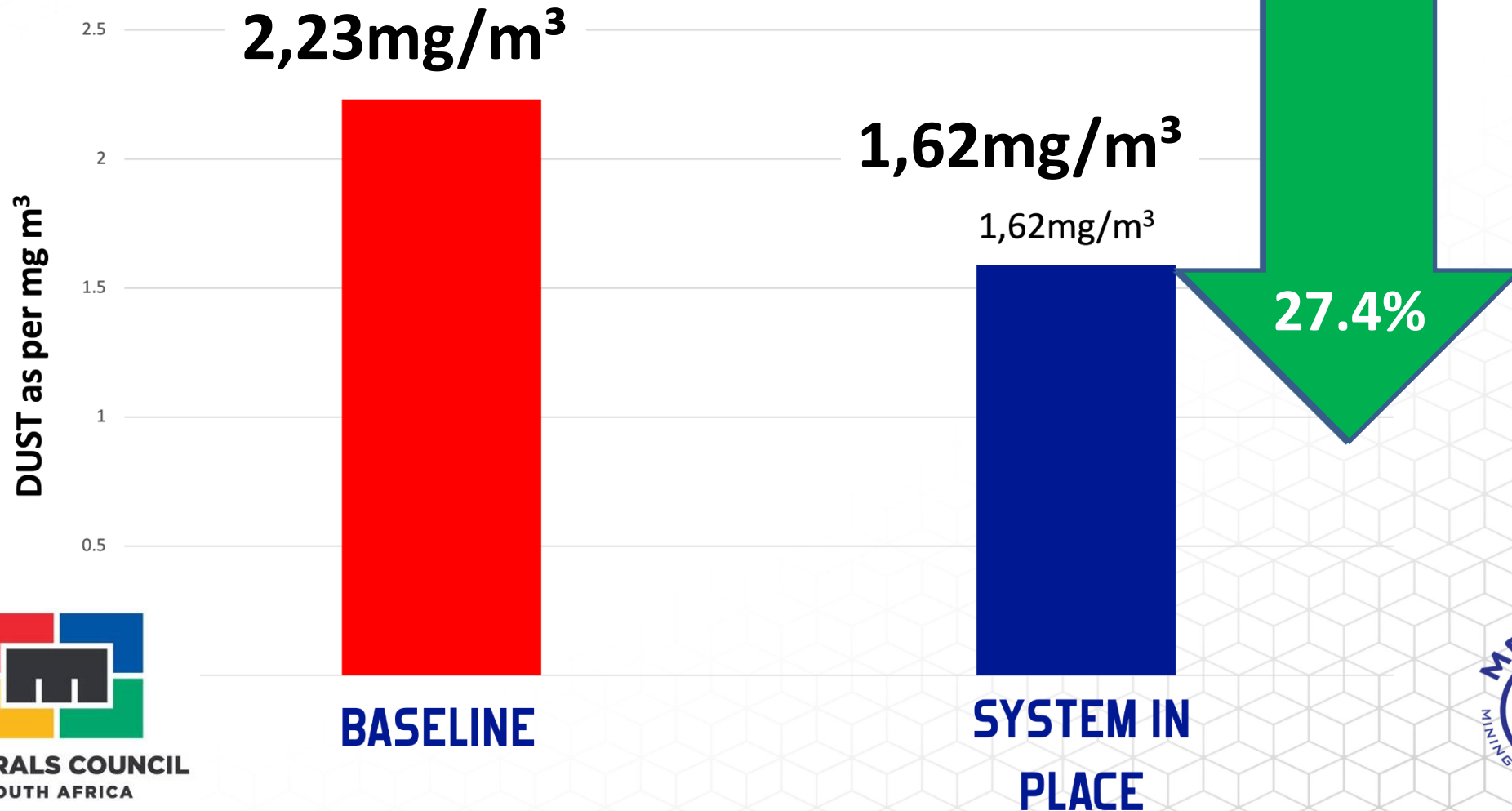
# APPLICATION POINTS – CONTINUOUS MINER



# APPLICATION POINTS – CONTINUOUS MINER



# CONTINUOUS MINER – DUST READINGS





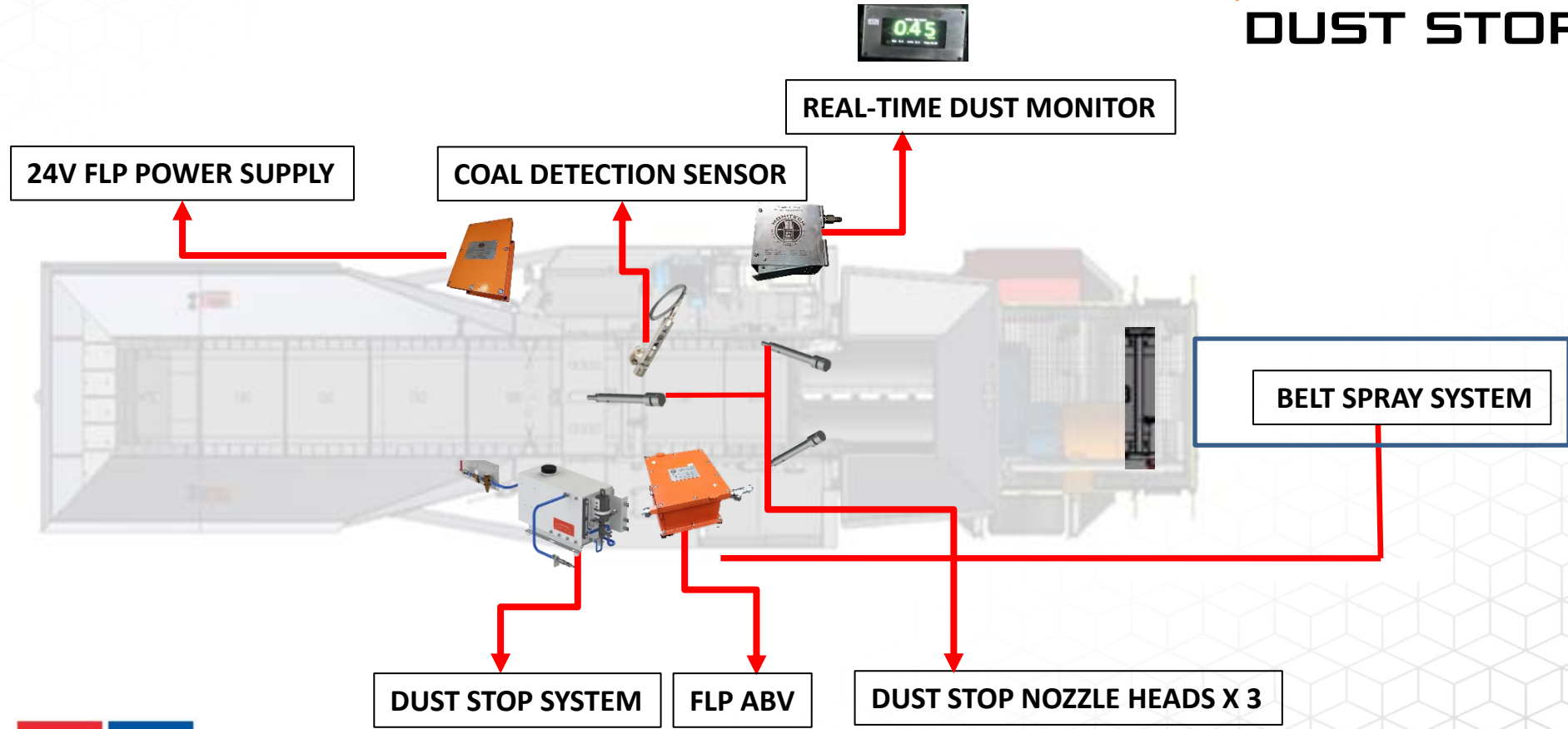
# KEY FINDINGS:

# FEEDER BREAKER





# FEEDER BREAKER PLACEMENT



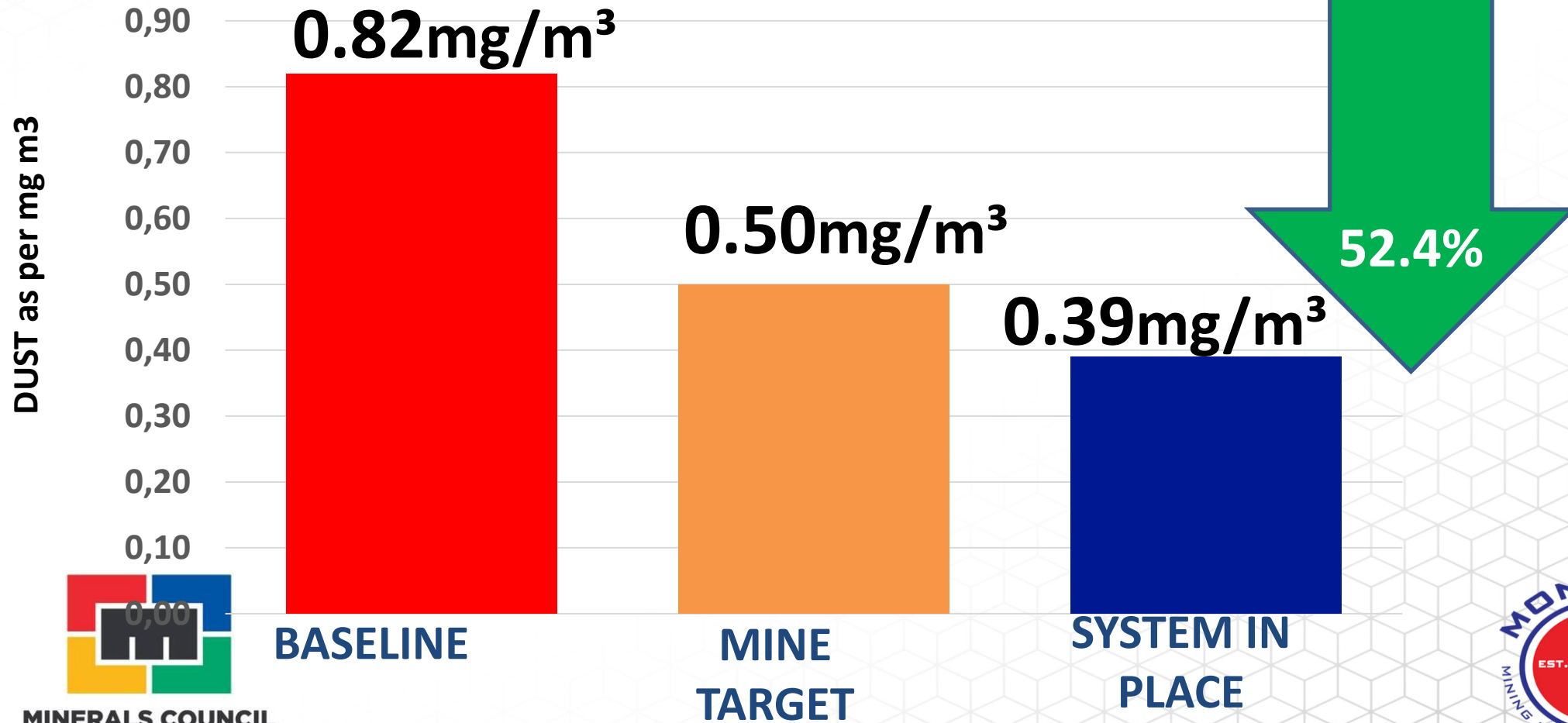


**DUST STOP**

**SYSTEM APPLICATIONS: FEEDER BREAKER**

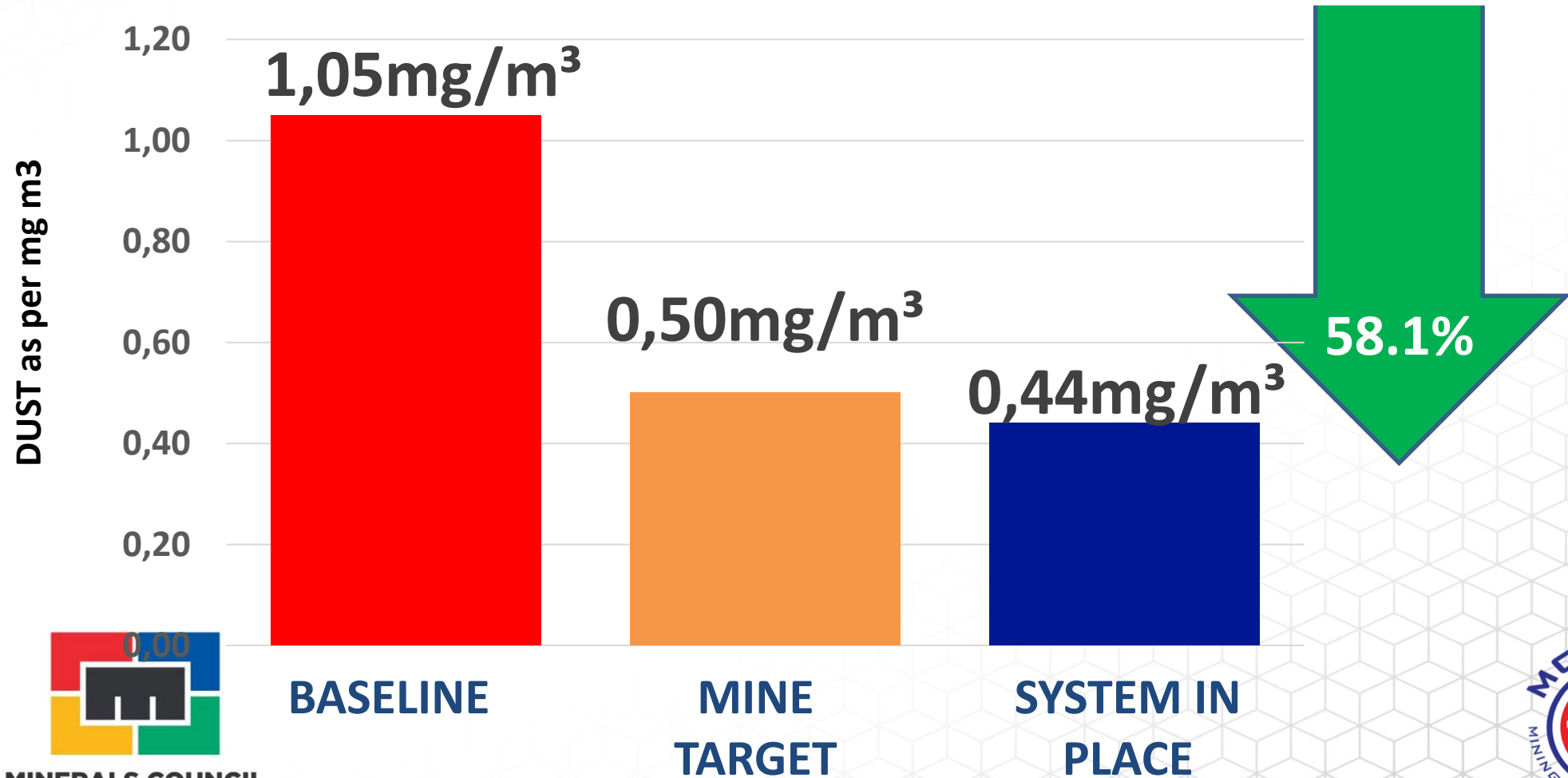


# FEEDER BREAKER- DUST READINGS AT FB



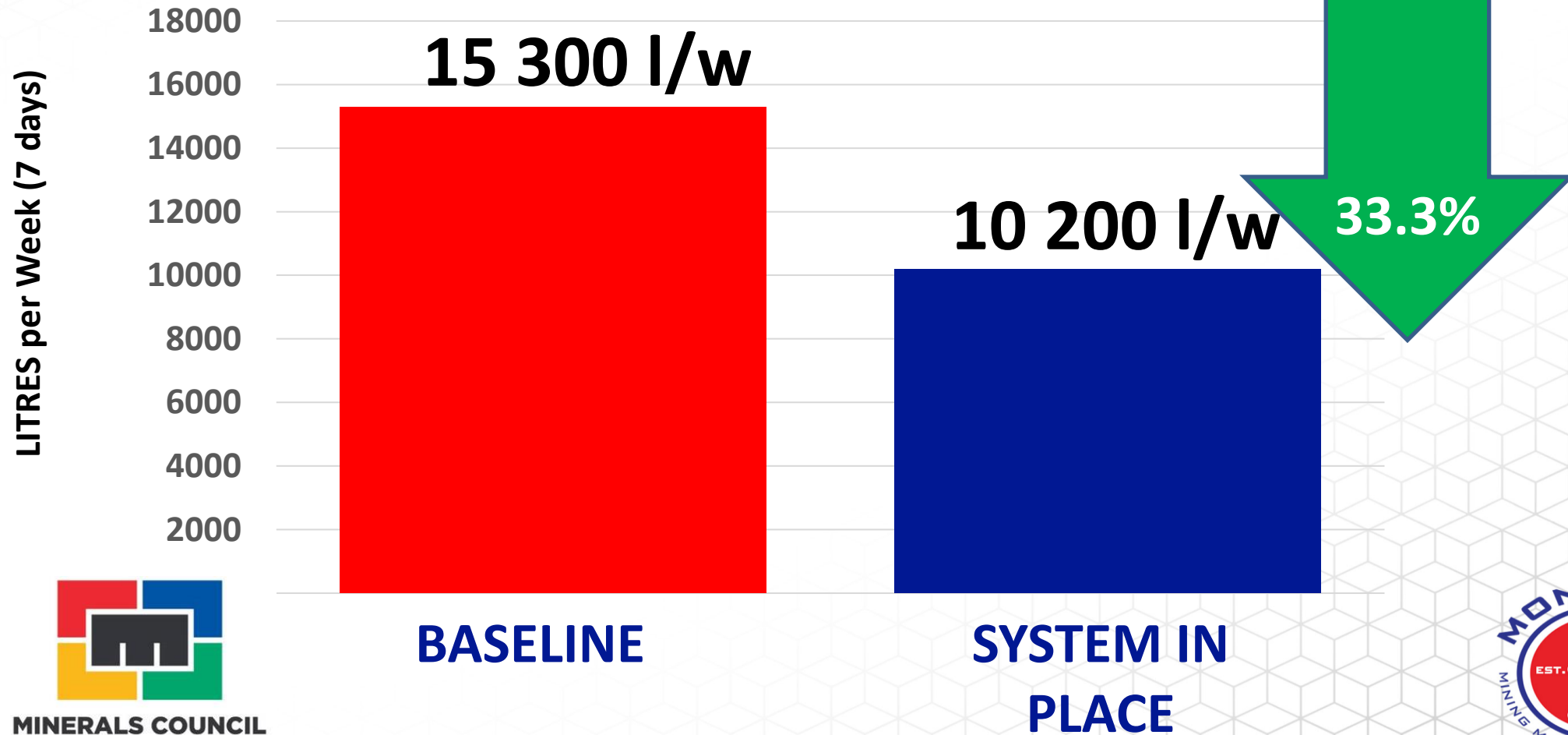


# FEEDER BREAKER- DUST READINGS AT BELT





# FEEDER BREAKER- WATER USAGE

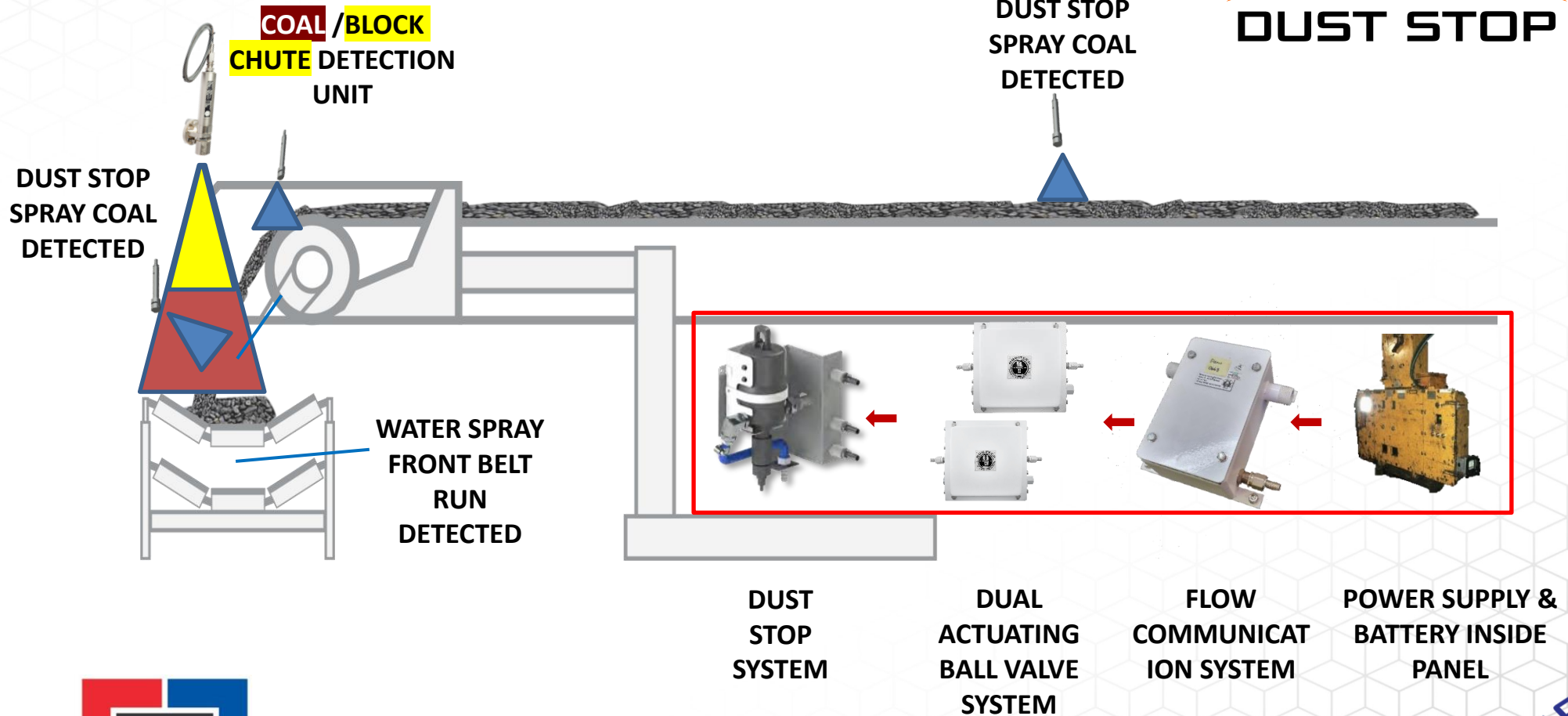


**KEY FINDINGS:**

**TRANSFER POINT**



# TRANSFER POINT PLACEMENT







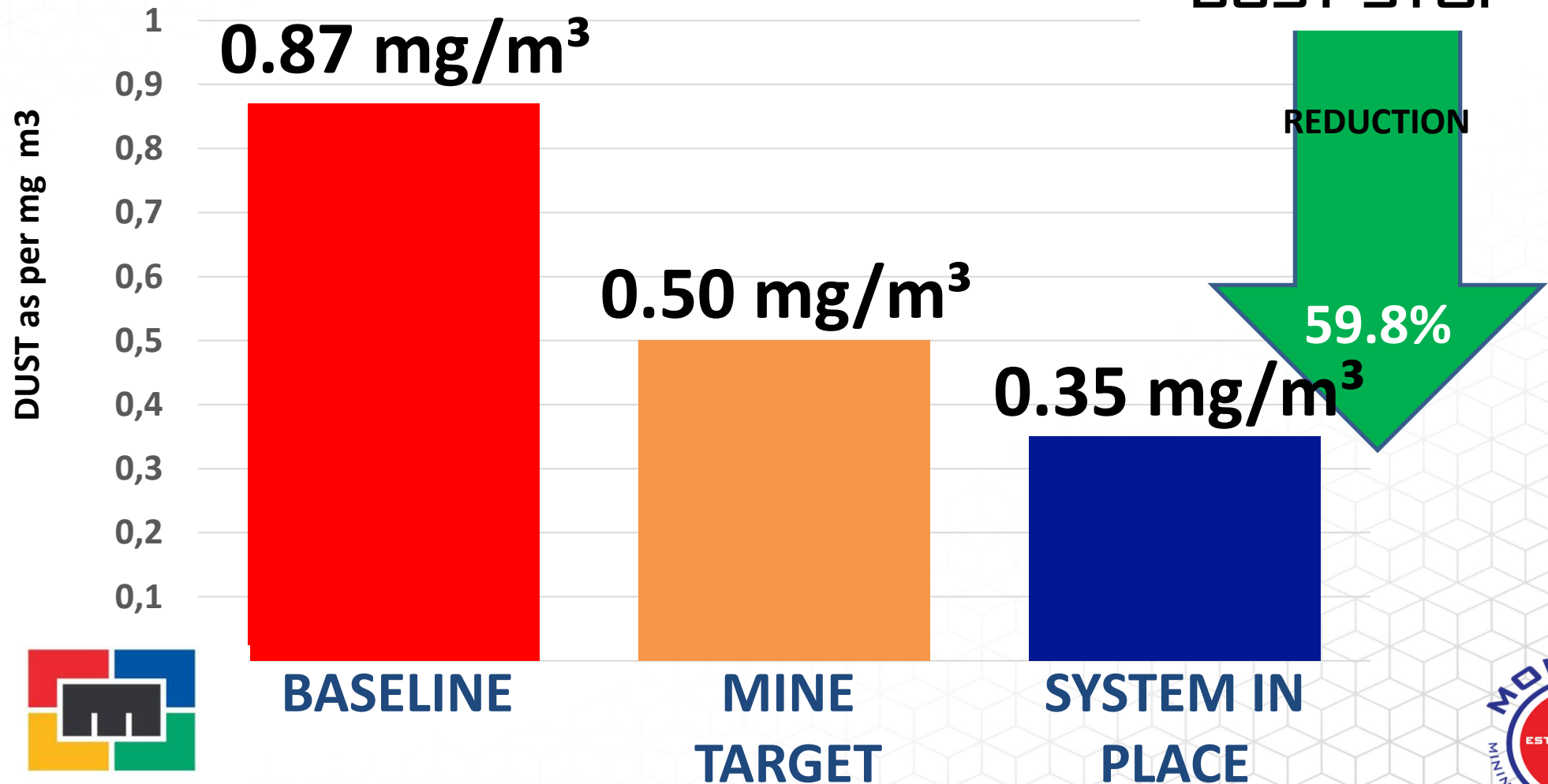
**DUST STOP**

# **SYSTEM APPLICATIONS: TRANSFER POINT**

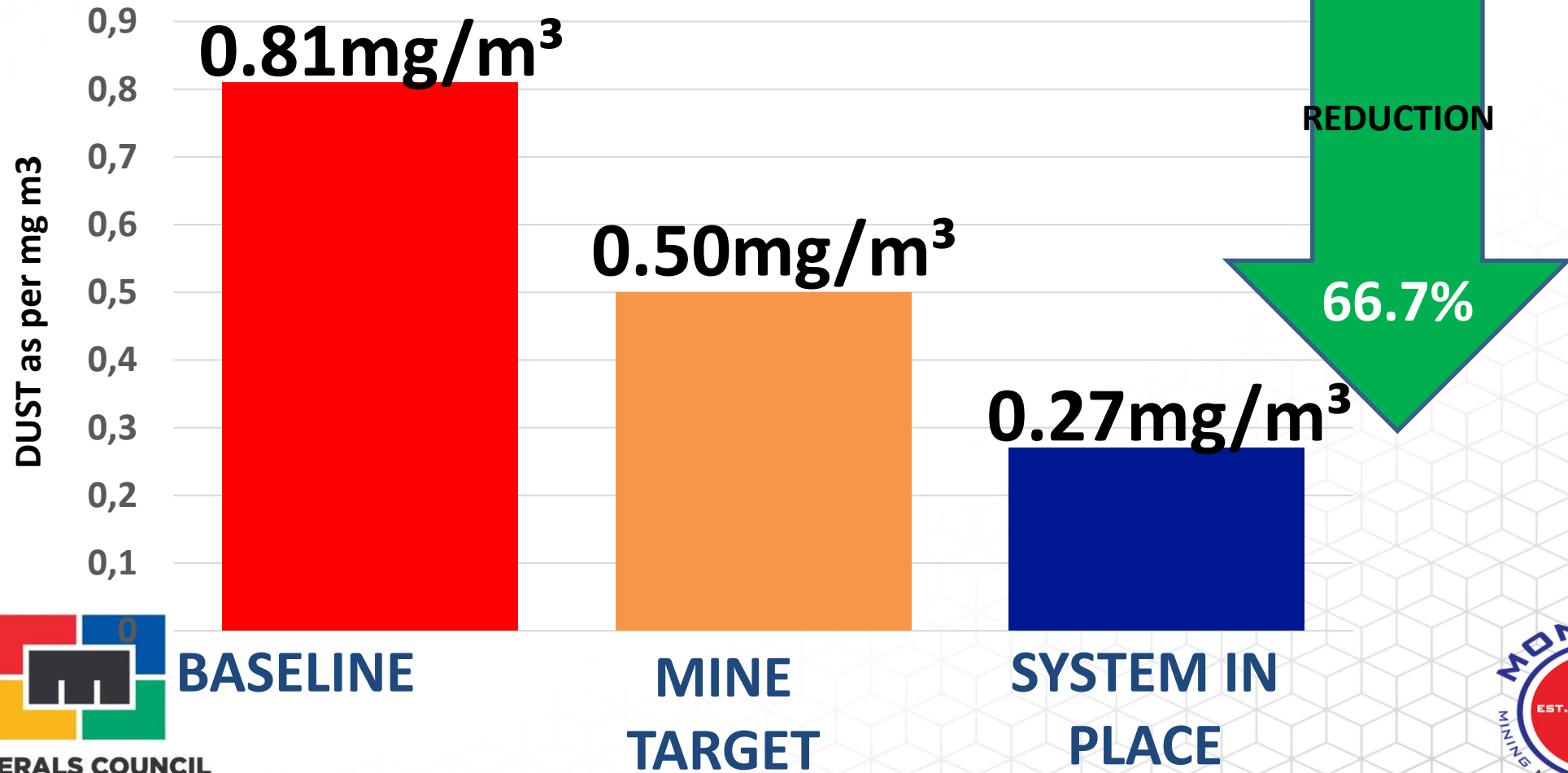




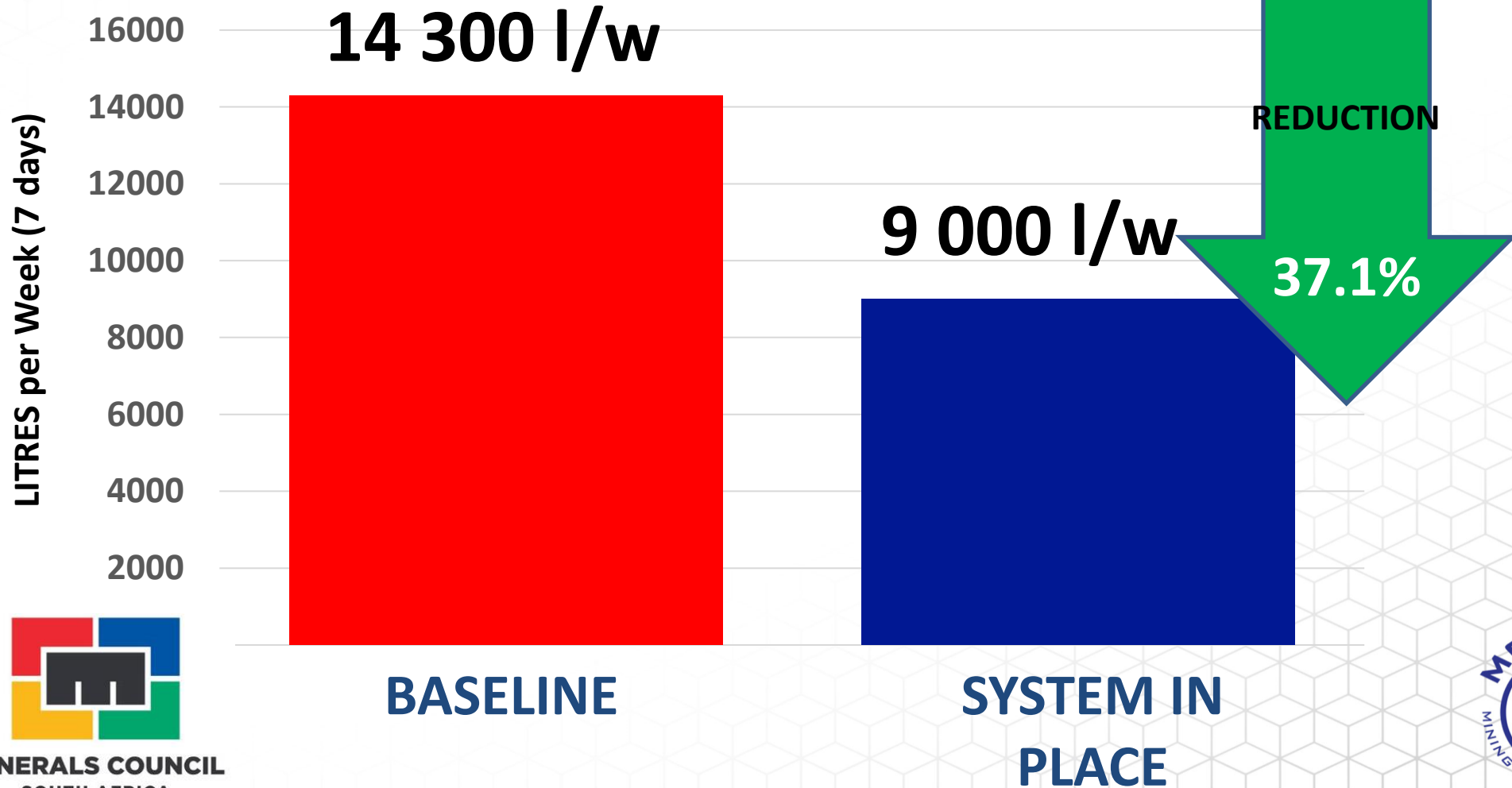
# TRANSFER POINT – DUST READINGS AT BELT 1



# TRANSFER POINT – DUST READINGS AT BELT 3



# TRANSFER POINT – WATER USAGE



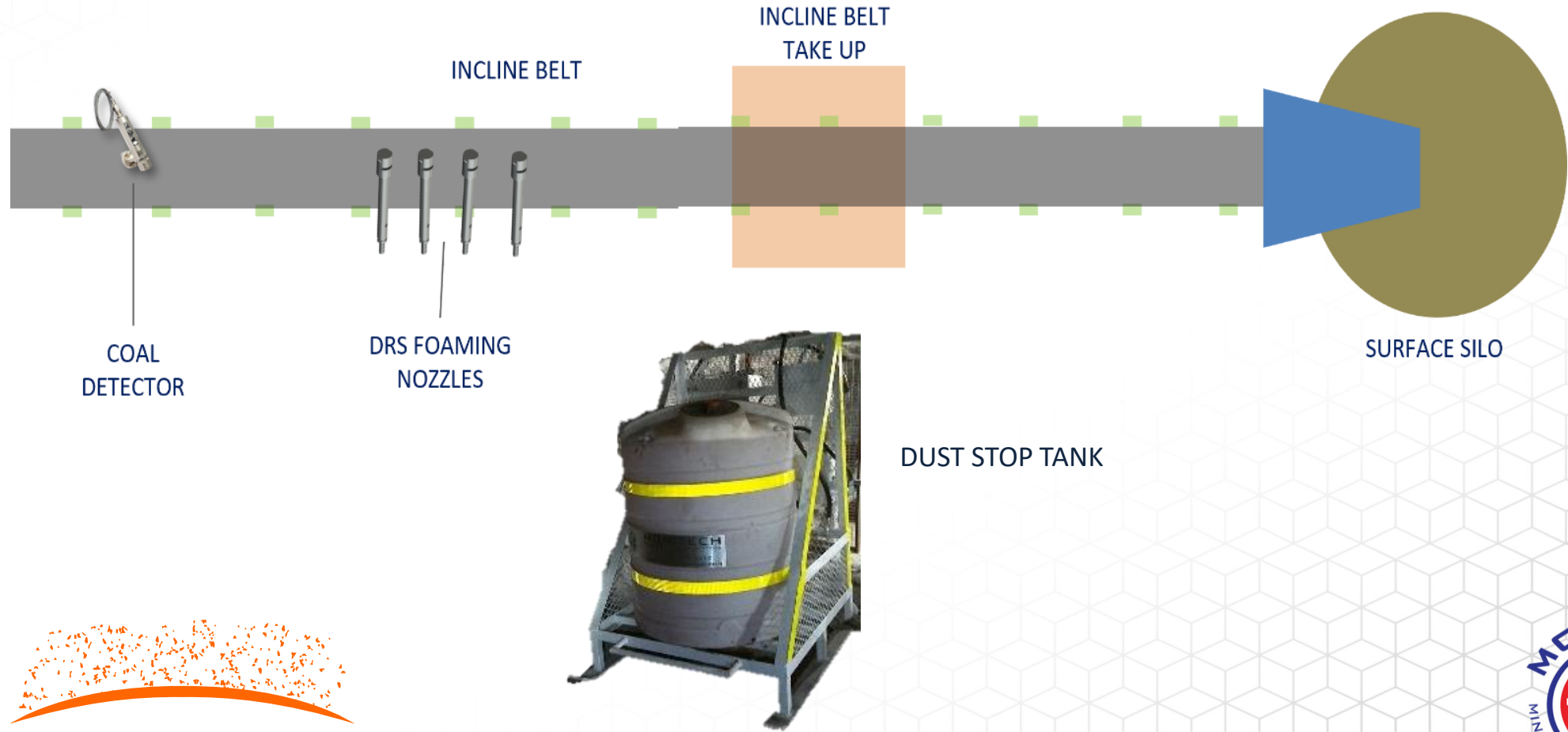
**KEY FINDINGS:**

**SURFACE APPLICATION**





# SURFACE APPLICATION PLACEMENT



  
**DUST STOP**



# SURFACE APPLICATION PLACEMENT

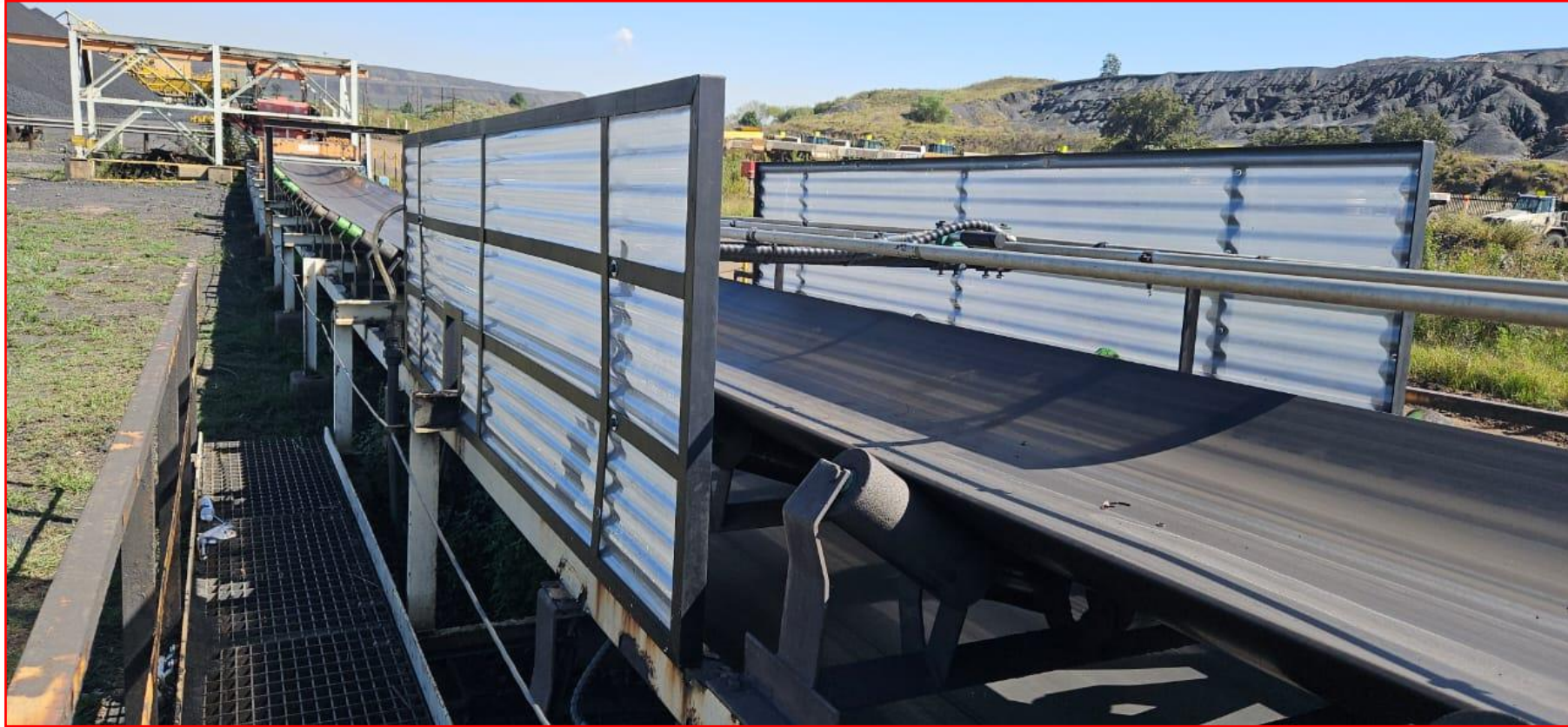


  
**DUST STOP**





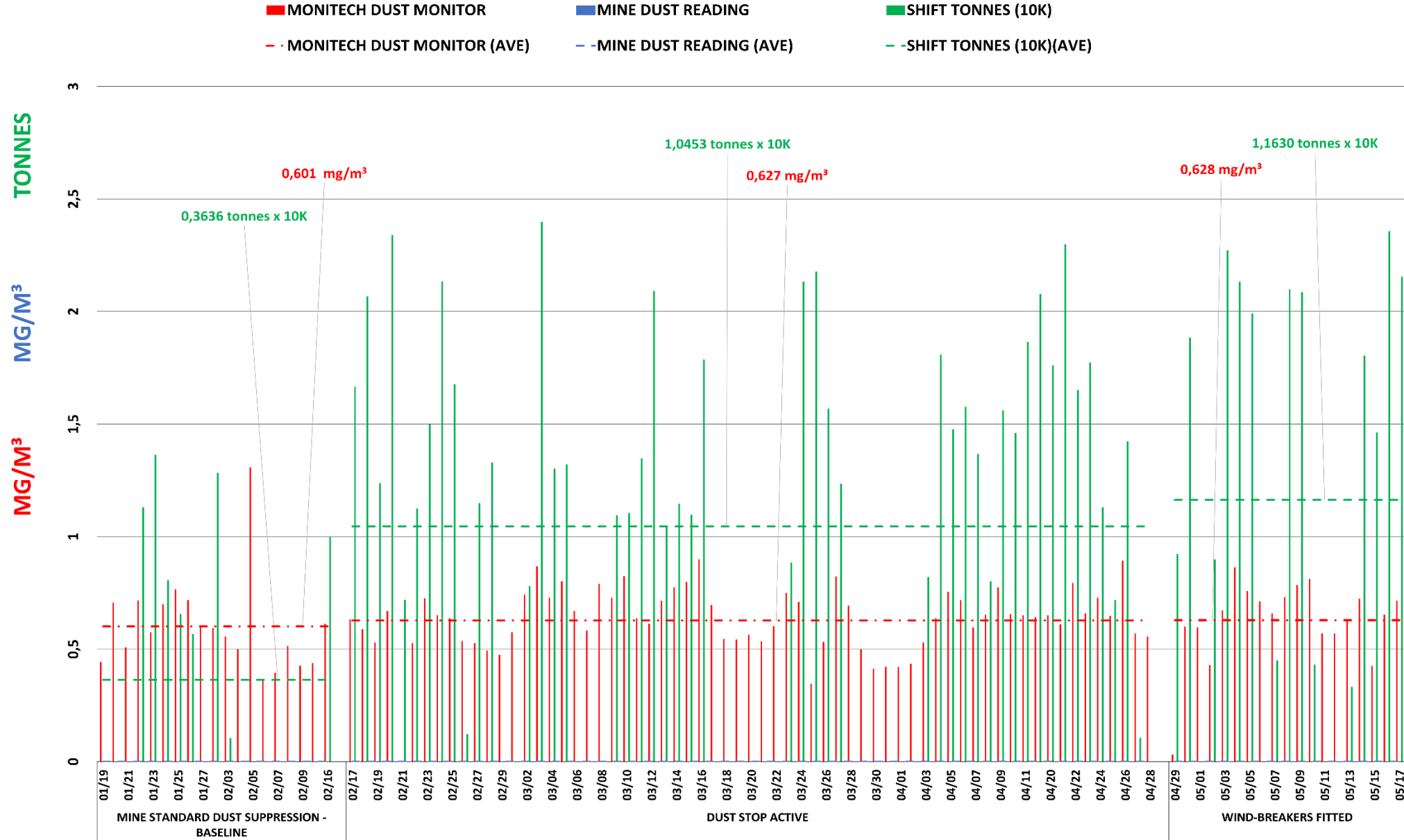
# SURFACE APPLICATION PLACEMENT



  
**DUST STOP**



# THUNGELA - KHWEZELA - NAVIGATION COMPARATIVE DUST vs TONNAGES







**MONITECH**  
MINING MONITORING SYSTEMS



**THANK YOU**

TEL: +27 11 395 4312

E-MAIL: [sales@monitech.co.za](mailto:sales@monitech.co.za)

[www.monitechmining.com](http://www.monitechmining.com)





**MONITECH**  
MINING MONITORING SYSTEMS



**THANK YOU**

TEL: +27 11 395 4312

E-MAIL: [sales@monitech.co.za](mailto:sales@monitech.co.za)

[www.monitechmining.com](http://www.monitechmining.com)

