



# DRAYTON MINE IMPROVEMENTS TO DUST AND EMISSIONS MANAGEMENT — AIR QUALITY INFORMATION SESSIONS

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Safety Health and Environment Manager

Family with two children aged 14 and 15

I have lived in Muswellbrook and now Singleton

## **Purpose**

**I have working in my role for over 17 years**

- **During this period I have seen and been part of significant improvements in the way in which the Mining Industry and Drayton have approached environmental issues – in particular our approach to dust and emissions from our sites.**
- **I am not here to say what we were doing was bad then and now it is good. I simply want to share with you what we do now that we did not do or we did to a lesser extent some years ago.**

**Why has this happened?**

- **Simply because of increasing community concerns. Whether this community be local, state, federal or international.**

## Improvements

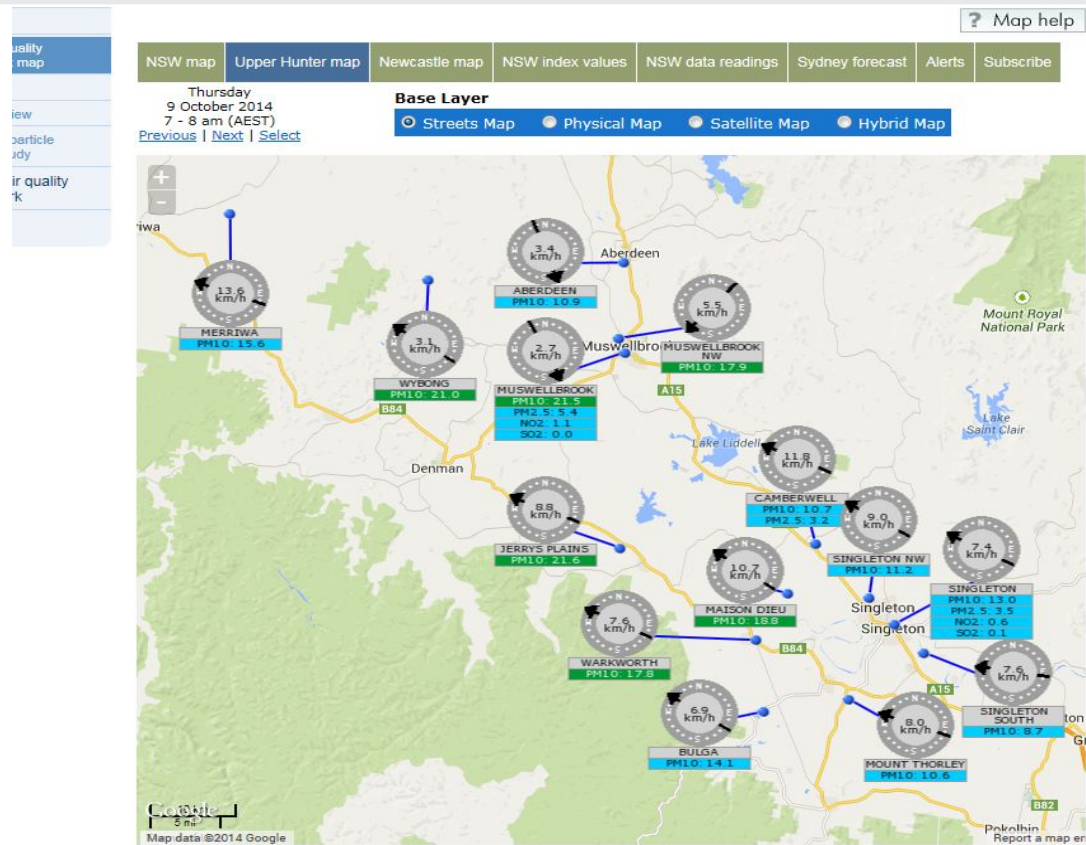
- **Improved engagement of regulators – presence, guidance, sharing of ideas**
- **Upper Hunter Air Quality Monitoring Network**
- **Aerial seeding of spoil dumps and disturbed areas**
- **‘Ultimate’ diesel**
- **Predictive daily dust risk alerts**
- **Real time dust monitoring**
- **Adjusting activities to reduce dust impacts**
- **Stopping parts of the operation to reduce dust impacts**
- **Reduction in areas of spontaneous combustion**
- **Spraying of coal wagons**
- **Improved blast management fume and dust**

## **Improved engagement of regulators – presence, guidance, sharing of ideas**

- Removal of the EPA officer from Muswellbrook years ago did not help anyone**
- EPA inspections and audits**
- Mines department inspections and audits – presence and guidance**
- Presence of the Planning inspections and audits - compliance officers on the ground**
- Better sharing of ideas, and understanding of issues**
- Sometimes penalty processes**

# Introduction of the Upper Hunter Air Quality Monitoring Network

- Real time data now available on line
- Assists with understanding local weather and dust conditions
- Alert process
- Real time data PM 10, NO2, SO2, PM 2.5
- Factual information – measures particulates from all sources



## Aerial seeding of spoil dumps and disturbed areas

- Disturbed areas 2-3 years
- Interim coverage of spoil dumps and disturbed areas



## **“Ultimate” diesel**

- **Lower sulphur diesel, it burns cleaner and has lower sulphur dioxide emissions.**
- **Burns more efficiently about %4 less diesel used**



# Predictive weather and daily dust risk forecasting

- Daily report - today plus next two days predicted
- Better understanding of dust risk at site – next few days
- Allows better short term planning and adjusting of the plan to reduce dust risks



## 01. Daily Dust Risk Report



Drayton

Issued: Tuesday, 7 October 2014 6:30:12 AM

Extreme ■ High ■ Moderate ■ Low ■ NA ■ No Data ■

### Day Shift - Tuesday

7/10/2014 6:00:00 AM - 7/10/2014 6:00:00 PM

Hours:	06 - 07	07 - 08	08 - 09	09 - 10	10 - 11	11 - 12	12 - 13	13 - 14	14 - 15	15 - 16	16 - 17	17 - 18
Dust Risk:	SW	NW	NW	NW	NW	NW	NW	W	W	W	W	SW
Inversion Strength:	None	None	None	None	None	None	None	None	None	None	None	None
Wind Speed (m/s):	5.7	6.7	9	10.4	8.4	9.1	6.9	7.2	7.7	6.1	5.8	5.6
Max Wind Gust (m/s):	7.1	8.4	11.4	13.4	10.6	11.6	8.7	9.1	9.7	7.6	7.2	7
Rain (mm):	0	0.1	0	0	0	0	0	0	0	0	0	0
Temperature (°C):	17.7	18.7	22.1	23.4	25.4	26.3	28.1	28.1	28.1	27.4	27.1	25.3
Mixing Height (m):	594.3	815.9	378.7	438.4	955.2	1338.5	2043	1899.7	1668.7	1463.8	1607.7	950.5
Inversion Strength (°C/100 m):	0	0	0	0	0	0	0	0	0	0	0	0

### Alerts

Tuesday 06:00 - Low dust risk. Light to moderate breeze predicted.  
 Tuesday 08:00 - Moderate dust risk. Fresh breeze and no rain predicted.  
 Tuesday 09:00 - High dust risk. Strong breeze and no rain predicted.  
 Tuesday 10:00 - Moderate dust risk. Fresh breeze and no rain predicted.  
 Tuesday 12:00 - Low dust risk. Light to moderate breeze predicted.

# Real time dust monitoring

- Real time data
- Automated alerts
- Better understanding of dust close to site





**Setting up the calibration of real time monitor off site**

# Adjusting activities to reduce dust risk

- Moving activities to reduce dust impacts during adverse weather conditions
- Decision may be based on real time data
- Decision may be based on observations

## Examples

Adverse Weather Day	Avg Wind Direction (°)	ESampler Alarm	Avg Wind Speed (km/h)	Monitored Dust Levels	Actions Recorded on Day
23/01/14	135.818	ES1	15.607	No Alarms - Total PM10 remained below 50µg/m3 at all times	Trucks directed to reduce speed for all of day shift. Dragline to lowspoil and slow down
4/02/14	137.903	ES1	16.438	No Alarms - Total PM10 remained below 100µg/m3 at all times	Dragline ceased operations between 3pm and 6.15pm
3/05/14	301.279	ES2	15.488	No Alarms - hourly average below 100µg/m3 all day and contributions less than 50µg/m3	Majority of equipment ceased operations between 6.20am and 12.15pm. Trucks directed to reduce speed for all of day shift. Dragline to lowspoil and slow down
4/05/14	301.63	ES2	16.212	No Alarms - hourly average below 150µg/m3 all day.	304 excavator and 4 trucks ceased operations between 12.50am and 1.15am. Trucks directed to reduce speed for all of day shift. Dragline to lowspoil and slow down
15/05/14	260.673	ES4	3.271	No Alarms - hourly average below 150µg/m3 all day.	Dragline instructed to slow and lower spoiling most of night shift.

## Activities stopped to reduce dust risk

- Stopping parts of operation during adverse weather conditions or if an activity has become too dusty
- Decision may be based on real time data
- Decision may be based on observations

### Examples

Adverse Weather Day	Avg Wind Direction (°)	ESampler Alarm	Avg Wind Speed (km/h)	Monitored Dust Levels	Actions Recorded on Day
19/05/14	299.328	ES2	5.261	No Alarms - hourly average below 150µg/m3 all day.	Dragline stopped form digging, 1hr.
<b>27/05/14</b>	294.921	ES3	9.19	Average PM10 remained below 50µg/m3 all day. ES2 not operating. Data from ES3	Dragline and shot loading ceased for the day.
<b>24/06/14</b>	300.246	ES2	18.187	Alarm at 9.15am as PM10 hourly average exceeded 150µg/m3. Level reduced to 70µg/m3 by 3.00pm.	All operations ceased between 11.30am and 3.15pm. Trucks directed to reduce speed for all of day shift. Dragline to lowspoil and slow down

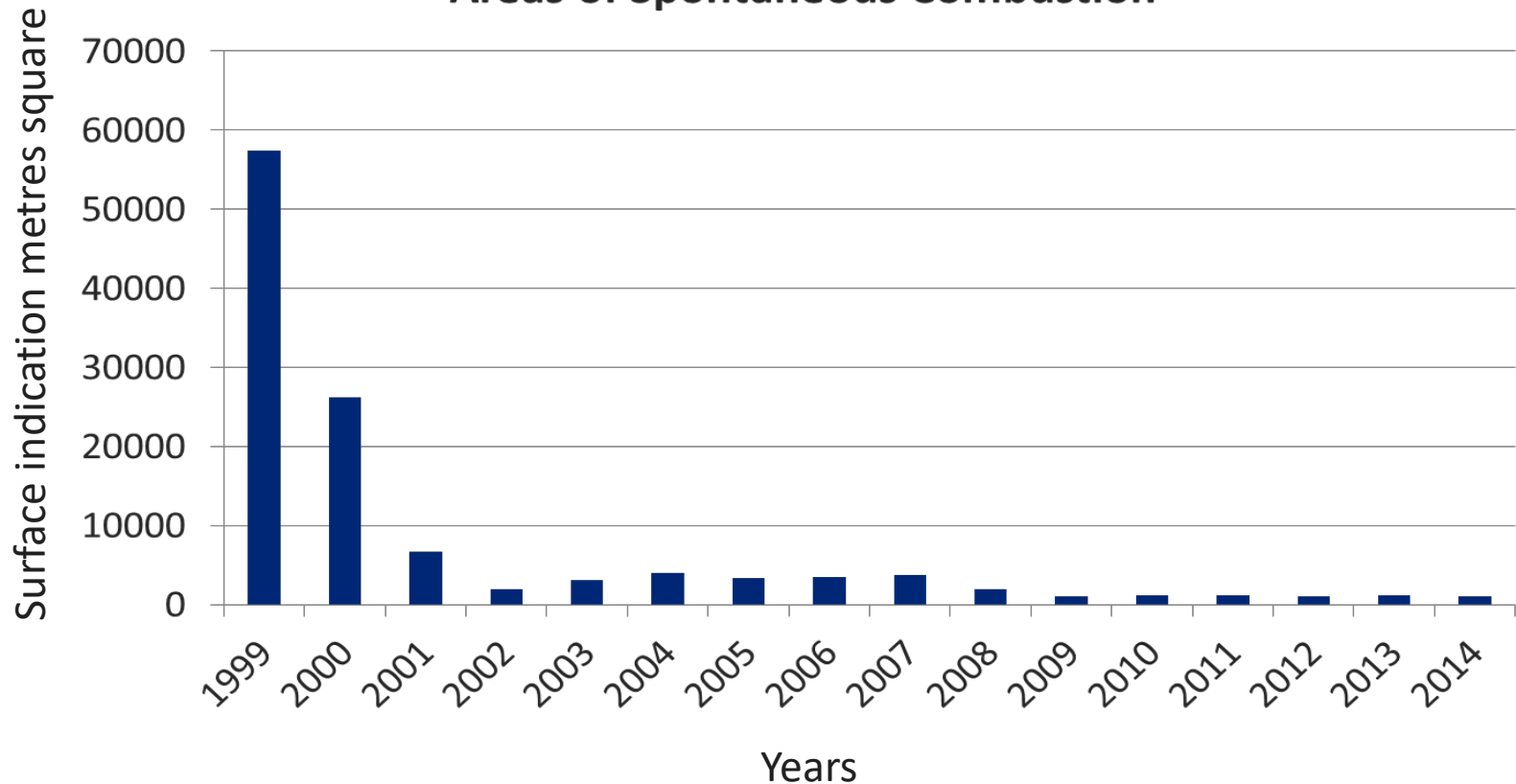
# Reduction in areas of spontaneous combustion – surface indication

## Characteristic of the Greta Coal Measures

Affects a small number of Hunter Valley operations

Drayton South does not mine from these coal measures

Areas of Spontaneous Combustion



## Spraying of coal wagons

- Sprayed with water
- Precautionary measure



## Blast Management

- Improved blast management with predictive tools using weather predictions and fume modelling.
- Design, plan and implement blasts to not have fume events.





## CONCLUSION

- **Share with you what we have improved and are doing now that we were not doing or doing to a lesser extent some years ago**
- **Has it made a difference?? I believe so;**
  - **We better understand dust and emissions (mining and non mining)**
  - **Better operational awareness and action both reactive and proactive on site**
  - **We see less observable dust issues on site**
  - **Longer term I believe we will see a reduction in dust concerns**