

# Rix's Creek Continuation of Mining Project

*Presentation to the  
Independent Planning Commission of NSW  
Noise Management and Predictive Environmental  
Forecasting at Rix's Creek Mine*

4 June 2018

# The Rix's Creek Continuation Project

## Environmental Management

- Rix's Creek Mine has developed a suite of predictive tools to assist in the environmental management of the mine operations.
- These include predictive forecasting tools for;
  - Noise
  - Air Quality
  - Blast Overpressure Reinforcement
  - Blast Plume (NOx) Air Quality

Models have been developed in association with Todoroski Air Sciences, Terrock, and the Hunter Valley Meteorological Sounding Joint Venture. (Lemington SODAR).

Rix's Creek Mine employs a Noise Assessment Technician who monitors noise during evening and night time operations.

## **The Rix's Creek Continuation Project**

### Nightly Attended Noise Monitoring

Rix's Creek Mine has developed best practice noise management, utilising meteorological and atmospheric predictive modelling. This noise management system involves trained noise personnel on the ground, providing real time feedback to allow modification to mining operations where required to ensure compliance.

# The Rix's Creek Continuation Project

## Daily Noise Management.

- Predictive forecast Model completed by 6am for upcoming evening.
- Review of prediction by Environmental personnel- email sent to Rix's Creek Mine Supervisors and Noise Officers detailing enhancement forecast for upcoming evening and night time period.
- Morning Production Meeting- discuss enhancement and operational changes if required. Note noise forecast and areas of enhancement in morning meeting.

**Environment:**

- No rain recorded yesterday – no rain forecast
- Low winds forecast – directional changes expected
- Max temp 22°C
- Fluren – Slashing Jobs at RCN and Out Of Pit Dump (OOPD) West Pit.
- HLM pest management program will commence on Thursday the 31<sup>st</sup> May 2018 targeting wild dogs and foxes. Notification process underway.
- 22T EXC onsite farm dam clean out at Bowmans paddock and sed dam clean out at OOPD West Pit.
- AECOM on site today (RCS) monthly DustTrack maintenance & DL's
- Biosolid Deliveries to RCS stockpile area ongoing
- Tonight's noise prediction models:
- RCS – Sporadic enhancement NE, E and S end of A/S, shifting to SW through N/S.
- RCN – Sporadic enhancement SE and SW end of A/s, towards SW through N/S

	Mon May 28	Tue May 29	Wed May 30	Thu May 31	Fri Jun 1	Sat Jun 2	Sun Jun 3
Summary	Mostly sunny	Fog then sunny	Showers	Mostly sunny	Sunny	Mostly sunny	Mostly sunny
Maximum	22°C	24°C	19°C	19°C	19°C	20°C	20°C
Minimum	6°C	5°C	9°C	2°C	4°C	4°C	4°C
Chance of Rain	5%	90%	90%	30%	30%	20%	30%
Rain Amount	< 1mm	1-5mm	1-5mm	< 1mm	< 1mm	< 1mm	< 1mm
UV Index	Moderate	Moderate	Moderate	Moderate	Low		
Frost Risk	Nil	Slight	Nil	Moderate	Slight	Slight	Slight
Wind Speed	9am 3pm 4 km/h 4 km/h	9am 3pm 7 km/h 10 km/h	9am 3pm 10 km/h 13 km/h	9am 3pm 15 km/h 15 km/h	9am 3pm 11 km/h 11 km/h	9am 3pm 11 km/h 8 km/h	9am 3pm 12 km/h 10 km/h
Wind Direction	NW N	NW NW	WNW WSW	WNW WSW	W WSW	WNW WSW	W WSW
Relative Humidity	81%	56%	74%	48%	86%	44%	62%
Dew Point	10°C 13°C	9°C 12°C	12°C 6°C	3°C 6°C	3°C 6°C	4°C 9°C	6°C 11°C

**Subject:** Rix's Creek mine noise monitoring last night: 28/05/2018

- Mine noise TARP not activated last night.
- Tonight's noise prediction models are forecasting widespread mine noise enhancement extending from the southwest to the east and northeast end of A/S. Through N/S the enhancement is predicted towards the east and northeast extending further north end of N/S.
- Please see attached PDF's for viewing of last night's noise summary table and tonight's predictive models.

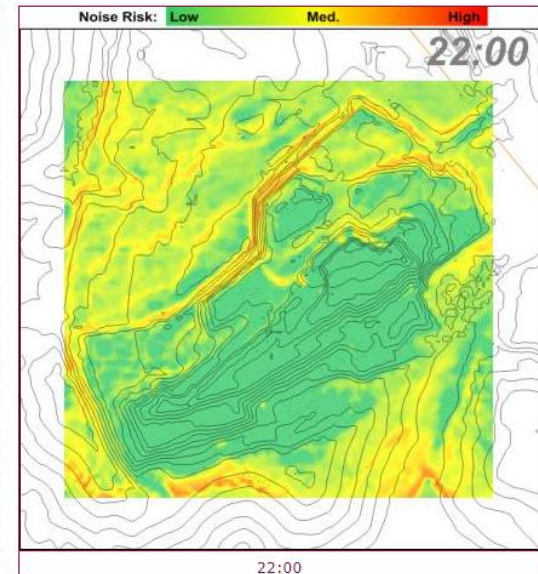
Kind regards,

**Richard Porter**  
Environmental Compliance Technician

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## Daily Noise Management.

- Noise Officer reviews enhancement predictions and determines offsite monitoring locations. Noise assessment is conducted at areas showing most enhancement.
- Monitoring conducted- noise measurement using calibrated Rion NL 62 hand held noise meter. LAeq 15 (15 min) plus LA1, (1 min).
- Supervisor notified if noise is within 2dBA of limit to consider operational changes
- If noise is at or above limit, Supervisor instructed to shutdown machinery- feedback provided by Noise Attendant on what can be heard- dozer tracks, diff whine, train or New England Highway noise etc.



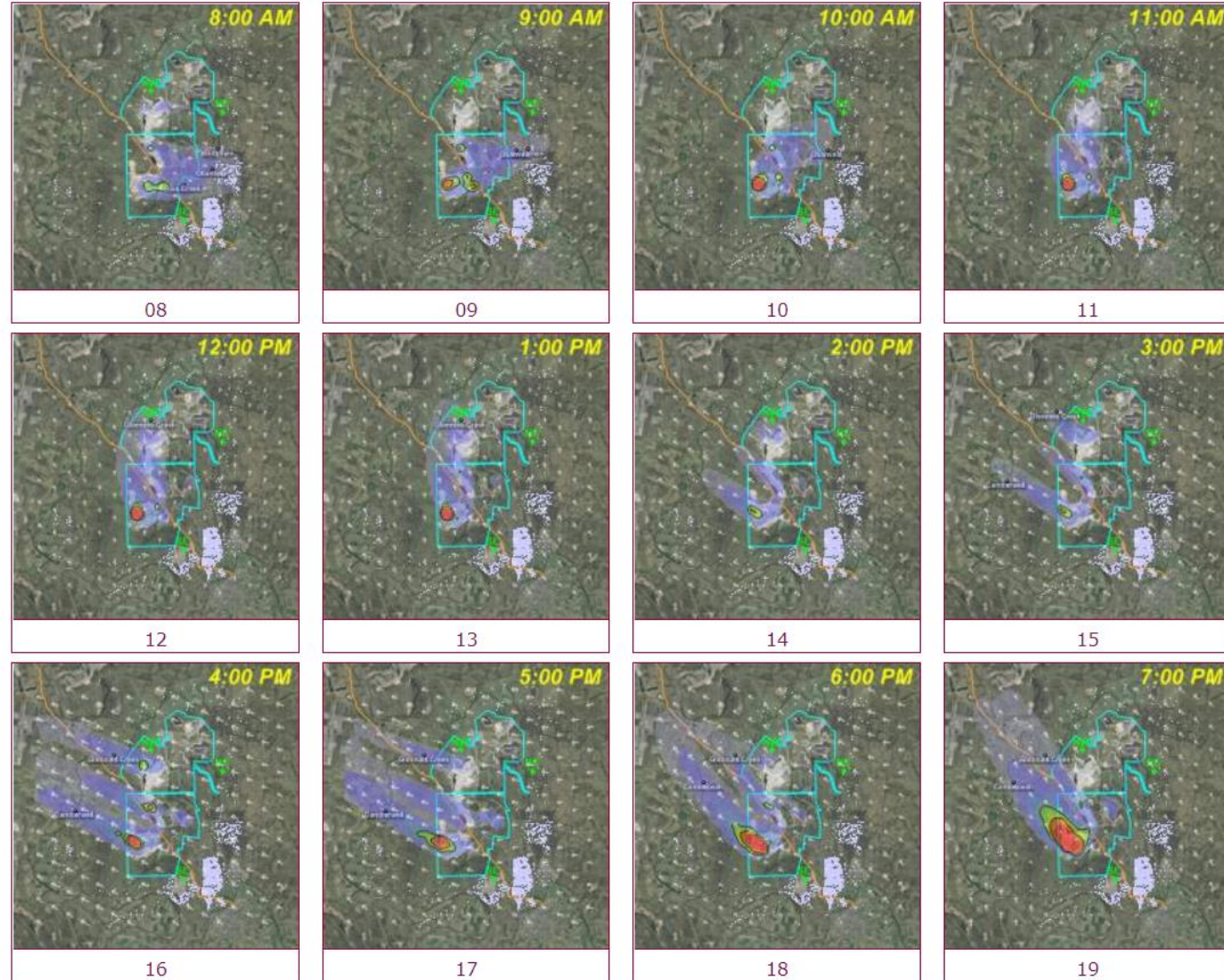
# Noise Management

- Noise Assessment Officer records noise levels, noise details and general information (met conditions).
- Records of contact with Supervisor and changes to operation is also recorded.
- Monitoring and modification to operations in accordance with approved Noise Management Plan.

Location	Time	Met Data • Wind m/s • Temp °C	Rix's identified noise	LAeq POA Rix's noise level – dB (A)	LAeq MAIN	LAleg	Model show enhancement at location?	Other Identified
RCS 5500 & D11-12 WE09 UB P5; 3600 & D11-9 WS11 29 Ptg; D10-8 West RL125 Dump; D10-13 ONP Dump								
RCN 9800 CM09 L19 P4d; 3600-2 CN08 L15 Tops; 6060 CM09 L19 Ptg; SK75-1 CS01 L38 S1; D50K CN07 L14 Infill; D75-1 CM07 L14 S2 In								
A/S								
Dights Crossing Rd, Maison Dieu (East – near Farruggia residence), Maison Dieu	Start 20:55 End 21:14	NW 2.3 m/s 22.7	Merged engine noise, diff whine, water cart.	37.7 dB (A)	39.4 dB (A)	60.0 dB (A)	Low	Local traffic, NEH other mine OPS, dog barks, insect
N/S								
Dights Crossing Rd, Maison Dieu (East – near Farruggia residence), Maison Dieu	Start 23:02 End 23:20	NE 1.8 m/s 22.1	Merged engine noise, dozer tracks, water cart, diff whine, first pass, horn.	33.7 dB (A)	37.2 dB (A)	38.6 dB (A)	Low	NEH, other mine train line, frogs, barks, insects, local traffic, birds.
10 Llanrian Drive, Maison Dieu (near Webb residence)	Start 23:31 End 23:55	ENE 1.5 m/s 22.0	None	N/A <33.4 dB (A)	42.0 dB (A)	64.4 dB (A)	Low	NEH constant noise, train line, local frogs, insects, birds, other mine OPS
225 Wattle Ponds Rd, Wattle Ponds	Start 00:12 End 00:32	E 1.5 m/s 22.3	RCN- merged engine noise, dozer tracks, water cart, diff whine.	33.0 dB (A)	49.2 dB (A)	52.8 dB (A)	Moderate	Local traffic, NEH frogs, dog barks, train line, helicopter, plane. (Brief 4 minute reading due to noise on train line).
Bridgman Rd (Uphill – Obanvale treatment works)	Start 00:57 End 01:23	ESE 2.0 m/s 19.9	RCN- hum.	30.4 dB (A)	37.1 dB (A)	52.0 dB (A)	Moderate	NEH, frogs, insect, dog barks, train birds.
229 Maison Dieu Rd, Maison Dieu (Farrelly residence)	Start 01:39 End 02:02	SE 4.0 m/s 19.7	First pass.	N/A <35.9 dB (A)	43.2 dB (A)	61.2 dB (A)	Moderate	NEH and Separate mine OPS constant noise, NEH, dog frogs, thunder, train line, other mine
Dights Crossing Rd, Maison Dieu (East – near Farruggia residence), Maison Dieu	Start 02:10 End 02:35	SE 4.0 m/s 18.5	Very faint excavator.	N/A <32.6 dB (A)	33.9 dB (A)	35.8 dB (A)	Moderate	Separate mine OPS constant noise, train line, frogs, barks, thunder, insects, and birds
Dights Crossing Rd, Maison Dieu (East – near Farruggia residence), Maison Dieu	Start 04:08 End 04:27	N 3.3 m/s 17.5	Dozer tracks, haul trucks, reverse, noise increasing.	N/A <36.9 dB (A)	37.8 dB (A)	39.3 dB (A)	Low	NEH and Separate mine OPS constant noise, frogs, birds, insects.

## The Rix's Creek Continuation Project

Rixs Creek PM<sub>10</sub> Dust Images For Thursday 24th Of May 2018



### Daily Predictive Modelling for Air Quality

- The EnvMet model is also used to provide guidance on air quality management.
- The model is used to determine times where operational changes are required to focus on increased dust minimisation.
- The Upper Hunter Air Quality Monitoring Network is also assessed to determine upstream air quality influence.

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## Predictive Modelling used for Blasting

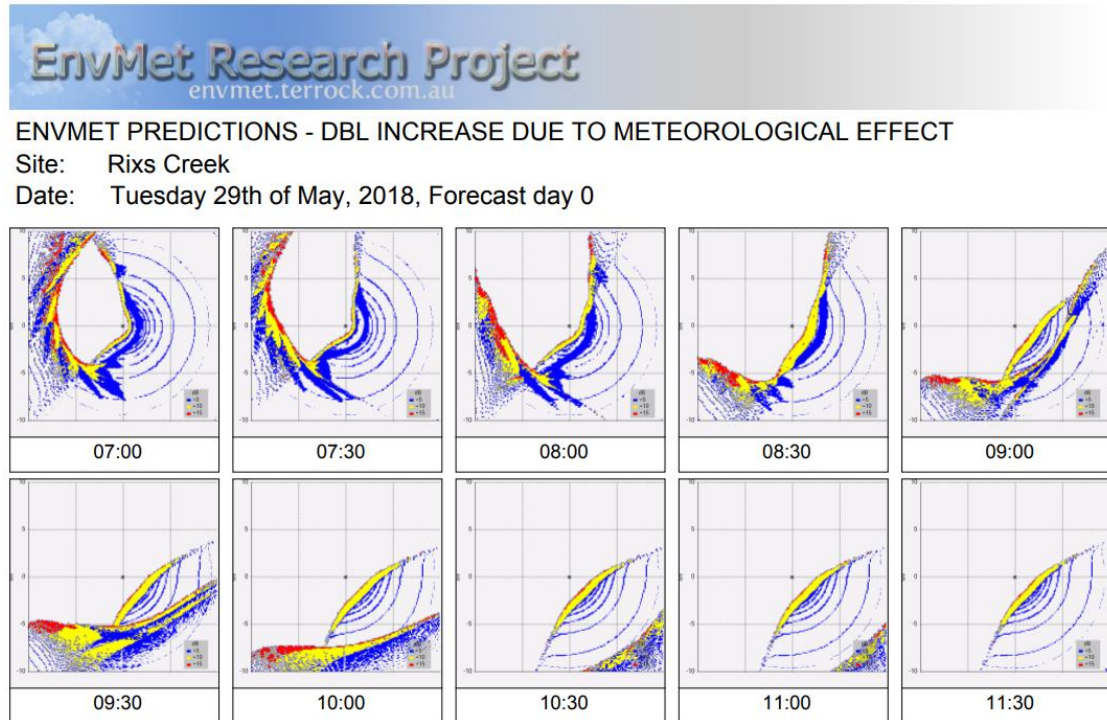
- The EnvMet model is also used to provide guidance for blasting.
- The model is used to determine when;
  - meteorological enhancement may increase the risk of blast overpressure.
  - meteorological conditions may direct blast plumes offsite toward receivers.
- The model is also used to predict the risk level of NO<sub>x</sub> within blast plumes leaving site and the level at which they may cause impact.
- These tools provide “environmentally sensible” windows where blasting will have limited effect on the surrounding community.
- These windows allow multiple blasts to occur with limited community impact, rather than increased risk from single blast per day restrictions.



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## Blast Overpressure Predictive Reinforcement Model

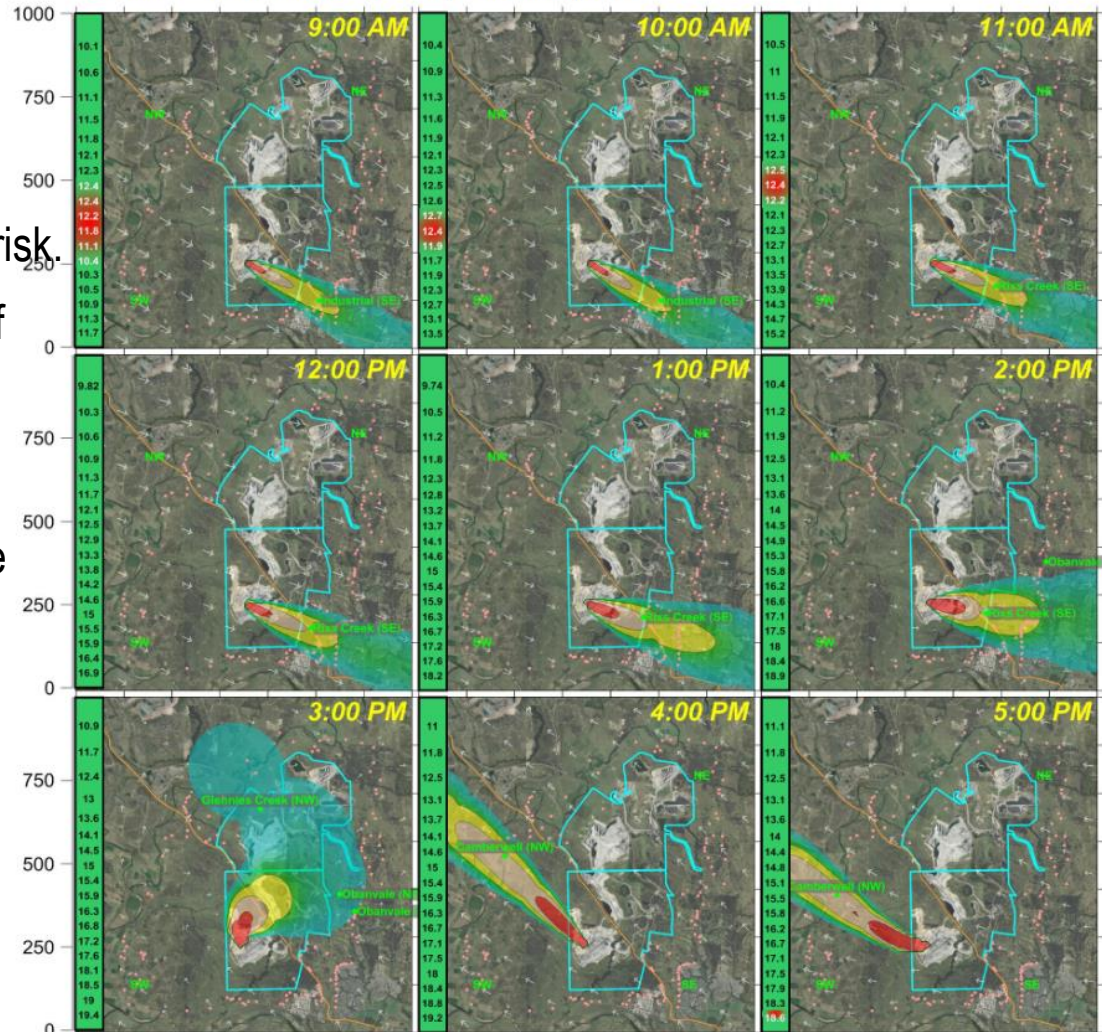
- Predictive risk of blast overpressure model created by Terrock in conjunction with Todoroski Air Sciences.
- Forecast model is assessed daily to determine the optimum time for blasting. This model reduces the risk of overpressure reinforcement to surrounding community.
- Risk and area of reinforcement shown half hourly.
- Forecast is reviewed by blast supervisor in discussion with Environment Officers to determine optimum blast time.
- In this example the optimum blast time is 11:30am



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## Predictive Plume Modelling

Rixs Creek - West Forecast For Friday 18th Of May 2018



Blast Coordinates for West Pit: 322984, 6399640 (Last updated: -)

Image Created: 18/05/2018 04:35

Low NO<sub>2</sub> Blast Medium NO<sub>2</sub> Blast High NO<sub>2</sub> Blast

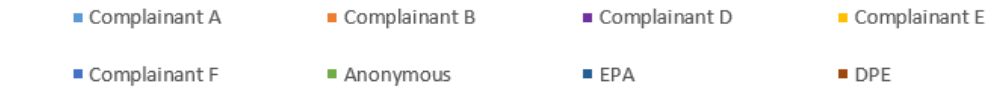
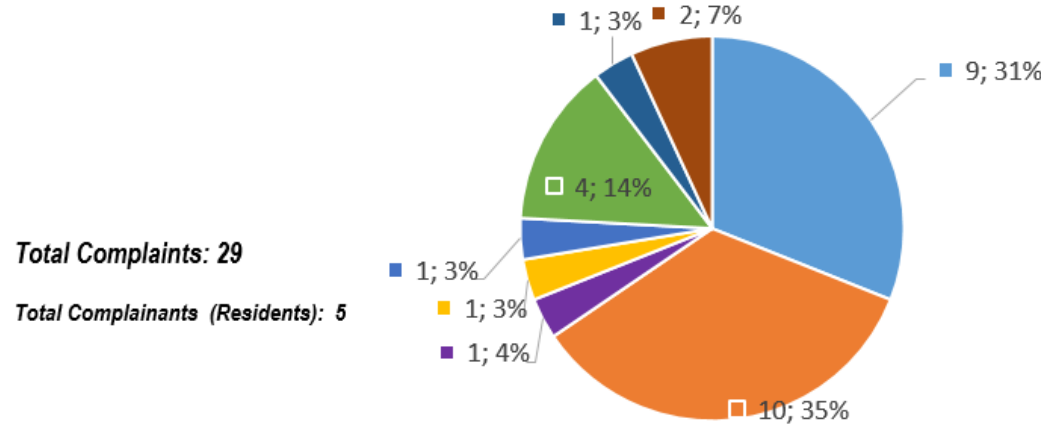
- Prediction of NO<sub>2</sub> level and plume direction modeled hourly.
- Risk rating of blast is used to determine likely fume generation risk.
- Length of plume related to level of NO<sub>x</sub> gas event.
- Forecast is reviewed by blast Supervisor in discussion with Environment Officers to determine optimum blast time.

# The Rix's Creek Continuation Project

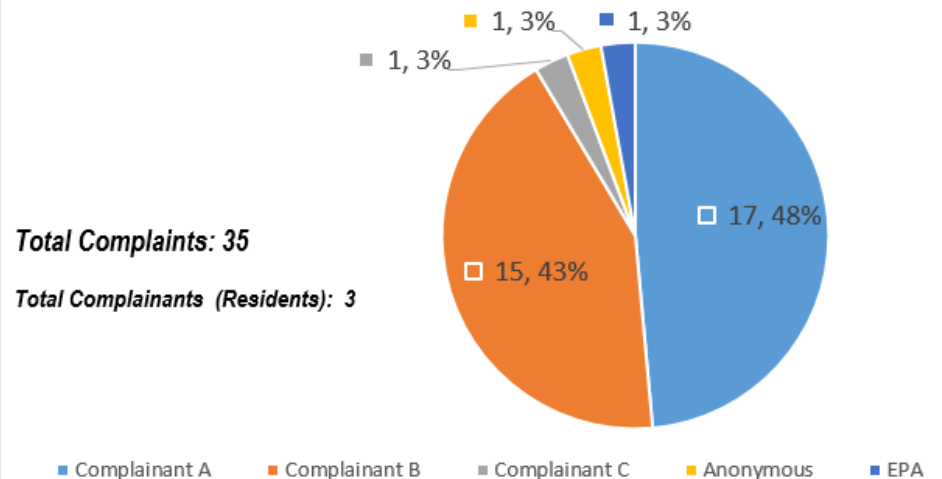
2017 Rix's Creek Mine Noise Complainant Breakdown

## Community Complaints

- No Noise complaints were identified as exceedances or non compliances.
- 2018- No Noise complaints at Rix's Creek Mine.
- 2017- 29 Noise complaints- 66% from 2 residents.
- 2016- 35 Noise complaints- 91% from 2 residents.
- Anonymous, and DPE / EPA complaints most likely from same two complainants however cannot be confirmed.



2016 Rix's Creek Mine Noise Complainant Breakdown



## The Rix's Creek Continuation Project

# *Discussion*

- Rix's Creek  
Continuation of  
Mining Project  
Tour

- bus route

