

IAQM – Assessing dust impacts of minerals and waste sites

A qualitative assessment technique

Alex Grant, DustScan Ltd

My details

- Chartered Mining Engineer (1978)
- MSc, Marine Environmental Protection (1992)
- Founding Partner, Smith Grant LLP (1993)
- Sole trader, Alex Grant AirQ (2009)
- Associate Consultant, DustScan (2012)
- Numerous dust assessments over past 20 years
- Developed risk assessment methodology
- Attended committees to update PGNs (2012)

Proposed development

- Hard rock / sand and gravel
- Size and nature of site
- Method of working
- Haulage and transport
- Ancillary processes, eg
 - Crushing and screening
 - Concrete batching
 - Roadstone coating
 - Aggregates recycling

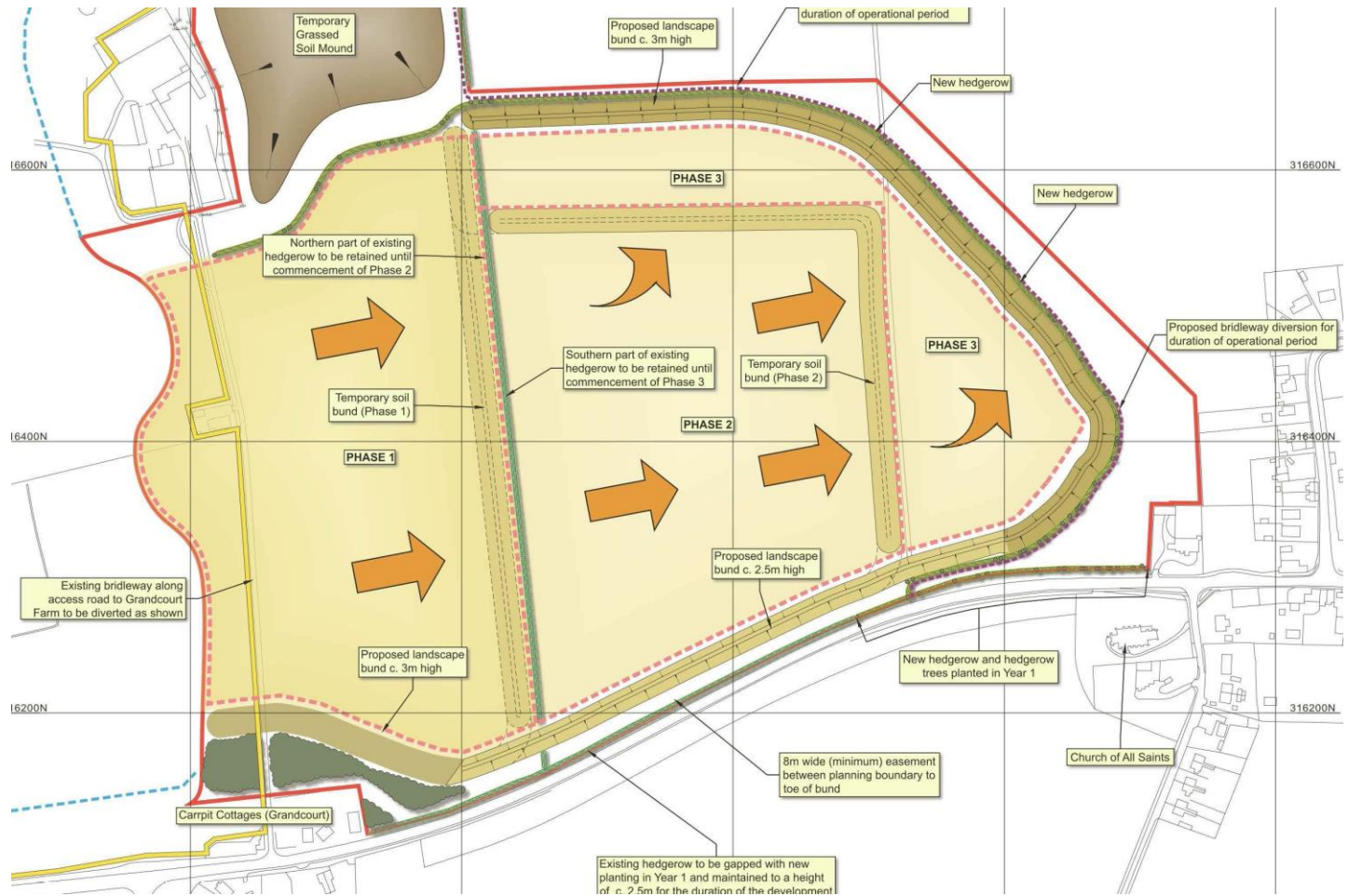
Site setting - 1

- Initial assessment
 - Maps / plans
 - GoogleEarth (may be out of date)
 - Rural / urban
- Site visit
 - Site operations (for extension sites)
 - Review permits / monitoring data / complaints
 - Application site
 - Surrounding area
 - Topography
 - Soils and geology

Site setting - 2

- Identify sensitive receptors, within
 - 250m for small or sand and gravel sites
 - 500m (or more) for large hard rock sites
 - 1000m for PM10
- Assess distances / directions to receptors
- Screening
 - Existing woodland and hedges
 - Advance planting
- Other dust sources

Example site



Sensitive receptors

Property	Working Area	Distance	Direction to workings	Screening
XXXX Road (NW)	Phase 3	140m	SW → W	unscreened
XXXX Road (S)	Phase 3	140m	W → NW	effective
XXXX House	Phase 2	190m	W	partial
	Phase 3	110m	W → NW	partial
XXXX Cottages	Phase 1	70m	N → NE	partial
	Phase 2	150m	NE	partial
	Haul route	250m	NW → NE	partial
XXXX Farm	Phase 1	80m	E → S	effective
	Phase 2	240m	E → SE	effective
	Phase 3	220m	E	effective
	Haul route	250m	SE → SW	effective

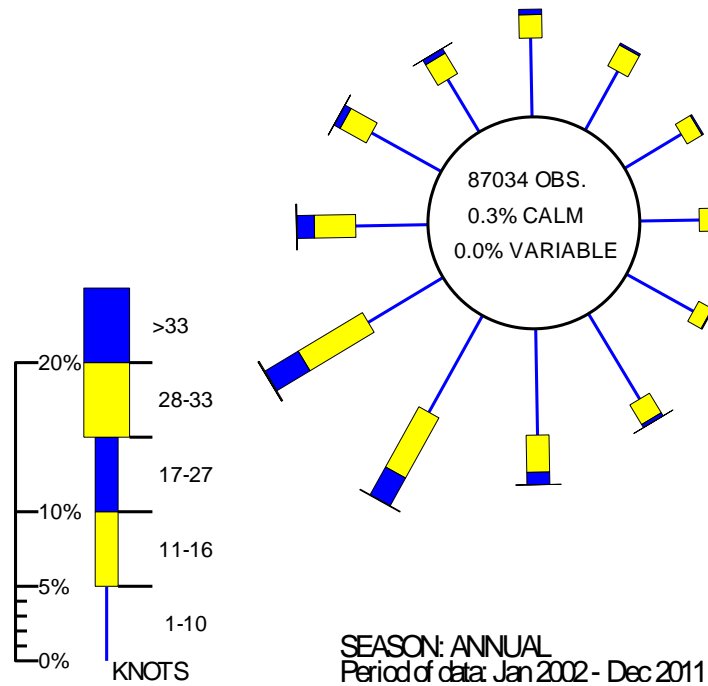
Environmental setting

- Wind speed and direction data
- Air Quality
 - Local dust regime
 - LAQM data
 - LAQM reports
- Site-specific monitoring data (if available)

Wind rose

WIND ROSE FOR MARHAM
N.G.R: 5736E 3090N

ALTITUDE: 21 metres a.m.s.l.



Indicative risk assessment matrix

from: *A Guide to Risk Assessment and Risk Management for Environmental Protection*, DoE, 1995

Probability	Magnitude of the Consequences			
	Severe	Moderate	Mild	Negligible
High	high	high	medium / low	near zero
Medium	high	medium	low	near zero
Low	high / medium	medium / low	low	near zero
Negligible	high / medium / low	medium / low	low	near zero

Magnitude of impact (large site)

Screening	Source – Receptor Distance			
	0–50m	50–100m	100–250m	>250m
None or ineffective	severe	severe	moderate	mild
Partially screened	severe	moderate	mild	negligible
Fully screened	moderate	mild	negligible	negligible

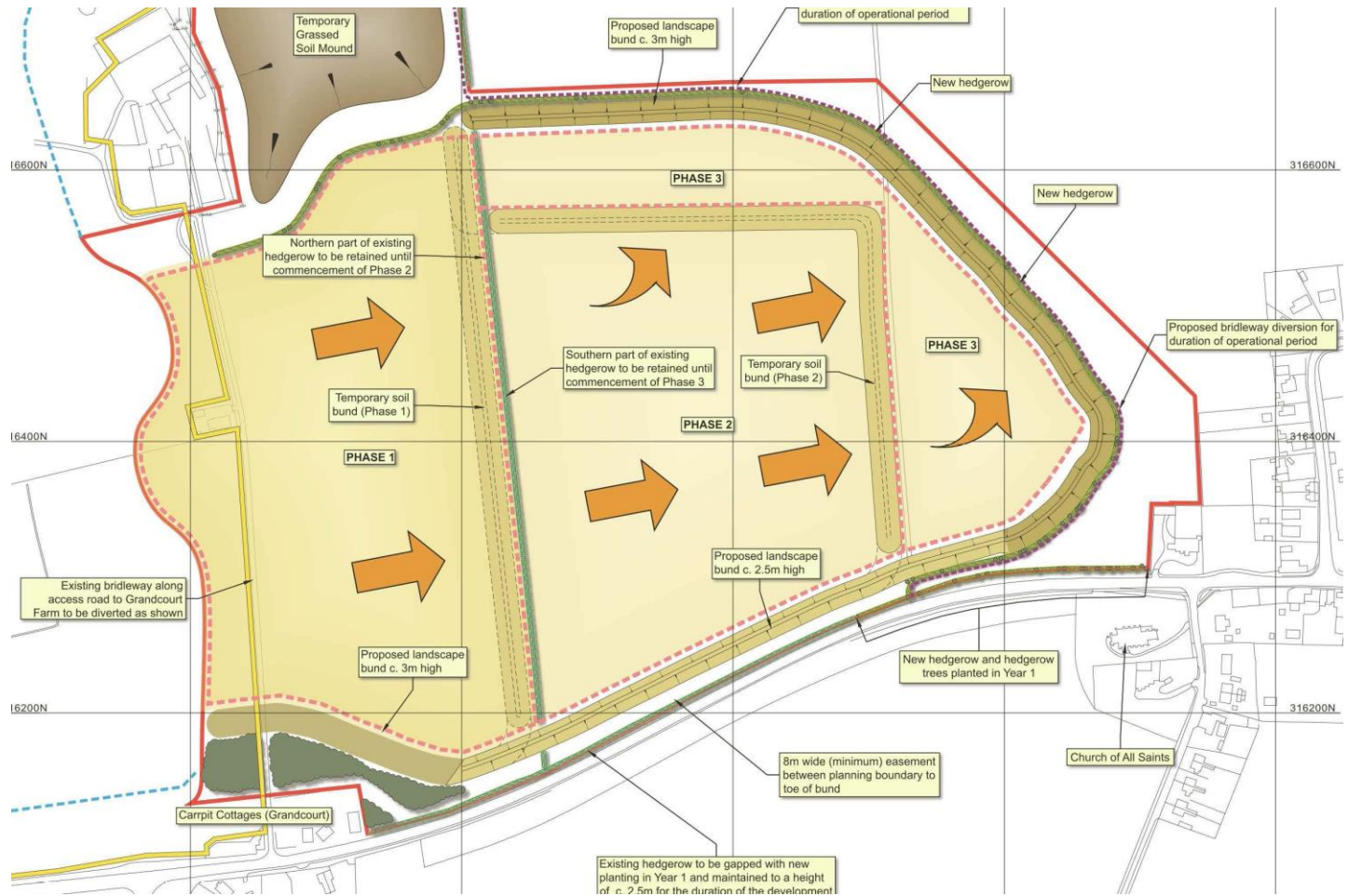
Magnitude of impact (small site)

Screening	Source – Receptor Distance			
	0–50m	50–100m	100–250m	>250m
None or ineffective	severe	moderate	mild	negligible
Partially screened	moderate	mild	negligible	negligible
Fully screened	mild	negligible	negligible	negligible

Probability of dust impact

Frequency of Winds	Probability of Impact
<3%	negligible
3 – 10%	low
11 – 20%	medium
>20%	high

Example site



Estimated risks (no mitigation)

refer to Appendix 1

Property	Working Area	Estimated risks	
		Fugitive	Wind blown
XXXX Road (NW)	Phase 3	high	medium
XXXX Road (S)	Phase 3	near zero	near zero
XXXX House	Phase 2	low	low
	Phase 3	medium / low	low
XXXX Cottages	Phase 1	medium	medium / low
	Phase 2	low	low
	Haul route	medium / low	low
XXXX Farm	Phase 1	medium / low	low
	Phase 2	near zero	near zero
	Phase 3	near zero	near zero
	Haul route	near zero	near zero

Mitigation

- Environmental Permit (if applicable)
- Process Guidance Note
- Published best practice guidance
- Essence of guidance is that dust can be controlled by effective site management
- Measures may be embodied in dust management and monitoring scheme

Effect of mitigation

- Effective mitigation is likely to reduce the magnitude of any impacts, ie:
 - “severe” impacts become “moderate”
 - “moderate” impacts become “mild”
 - “mild” impacts become “negligible”

Estimated risks (after mitigation)

refer to Appendix 2

Property	Working Area	Estimated risks	
		Fugitive	Wind blown
XXXX Road (NW)	Phase 3	medium / low	low
XXXX Road (S)	Phase 3	near zero	near zero
XXXX House	Phase 2	near zero	near zero
	Phase 3	near zero	near zero
XXXX Cottages	Phase 1	low	low
	Phase 2	near zero	near zero
	Haul route	near zero	near zero
XXXX Farm	Phase 1	near zero	near zero
	Phase 2	near zero	near zero
	Phase 3	near zero	near zero
	Haul route	near zero	near zero

Other considerations

- Cumulative impact – can be assessed using similar methodology
- PM10 – outside the scope of this presentation

Outcome

- Planning permission obtained for new sites and for extensions
- In appeals against refusal, assessments have been presented at Public Inquiries, generally without significant challenge
- Unaware of regulatory action against any quarry assessed as described in conjunction with dust management scheme