



Australian Government
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Checklists for Sustainable Minerals

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Checklist for Dust Control

Issue	Outputs	Performance Measure	Improvement	Comments	Notes
Part 1: Information and Planning - refer chapters 1-4 in Dust Control Sustainable Minerals booklet					
1.1 Have you determined the sources of dust in your operation?	Potential sources of dust identified in Environmental Impact Statement (EIS) or other report	Comprehensive list of individual sources, including land clearing, topsoil removal, blasting & drilling, excavation, processing, crushing & screening equipment, materials transfer, haul trucks, stockpile/dump/tailings surfaces, roads.	Sources considered for each stage of the mine, ie exploration, construction, operation, decommissioning, rehabilitation & closure.	Almost all forms of mining create dust, from the exploration stage, through bulk sampling, mine development, operation, & closure (decommissioning & rehabilitation). Bare surfaces may also be a dust source after mine closure. Visual inspection by an experienced operator is usually all that is	

				needed to readily identify & rank dust sources.	
1.2 Have you attempted to characterise the types of dust & quantities that will be produced?	- Estimates of dust types & levels likely to be produced - Dust emission inventory & determination of dust emission factors	Estimates based on typical measured levels for mining plant, eg see Table 2 in booklet. Dust inventory derived by analysing the mine plan to establish potential dust sources & estimating the level of dust-producing activity associated with each source. Emission factors derived by assessing the quantifiable activities or aspects which generate dust, such as vehicle size, speed & distance travelled on haul roads.	Estimates, inventory & emission factors made for all potential sources for each stage of the mine, ie exploration, construction, operation, decommissioning, rehabilitation & closure. An example of the calculation of an emission factor is given in section 2.3 of the booklet. Case Study 10 describes the application of emission factors in modelling of dust emissions for mine planning.	The information gathering stage is a major component of EIA, which is described in the Environmental Impact Assessment Sustainable Minerals booklet. Information needed to produce a dust inventory includes: - length of haul routes, vehicle-km travelled & vehicle types - quantities of material to be mined - size & number of blasts, no of blast holes drilled - area of exposed surfaces (pre-stripping, waste dumps, stockpiles etc) - physical properties of materials handled & of bare surfaces, including moisture, silt content, &	

				particle size distribution • truck capacities, bucket sizes, drop distances • wind speed, no of rain days.	
1.3 Does your characterisation of the types & quantities of dust include diffuse dust sources?	All types & locations of dust emissions can be ranked & controls planned in a systematic manner.	Quantitative estimates of dust emission rates from different classes of mining activity & land surface types, eg blasting, haul road traffic & waste dump surfaces - ie including point & diffuse sources.	Use of models to produce estimates of dust types & levels across a wide range of operating & climatic conditions	Models that predict ambient dust concentrations or deposition rates are commonly used in mine planning. The models use source dust emission rates in conjunction with meteorological data to produce contour maps of dust concentrations.	
1.4 Have you undertaken an impact assessment to identify possible impacts arising?	• Identification of sensitive receptors • assessment of maximum levels to avoid impacts, significant concerns or discomfort	Assessment identifies dust levels likely to be experienced by workers, & at key locations, ie closest residences, paddocks with domestic stock, & assesses possible impacts.	The potential health risk from dust is related to the size of dust particles. Mine dust lies in the range 1-100 microns; <10 μ is inhalable (ie PM10); <2.5 μ is respirable, ie can lodge in the lung (PM2.5).		
1.5 Based upon the impact assessment, have you developed a draft management strategy?	A draft management strategy which incorporates input from the community & regulatory authorities & addresses the full	Initial planning should include development of a draft management strategy which: • identifies all of the	Consultation with key stakeholders during preparation of the draft management strategy		

	suite of environmental & social issues likely to arise from dust at the proposed project.	potential sources & risks • sets out objectives for environmental protection & risk minimisation • provides a framework for evaluating different options & choosing a design which reflects site conditions & environmental sensitivities			
1.6 Have you devised approaches to mitigate impacts to acceptable levels?	Strategy incorporates "built in" design features to minimise generation of dust at source	Strategy includes section addressing mitigation of dust.	The EIS & mine plan for the project set out a framework based on: • mine design to avoid generation of dust • systems design & management to minimise generation of dust during operations • treatment of dust problems through active monitoring & response, & redesign of strategies if required.		
1.7 Have you considered the probable regulatory requirements?	Level to which targets in the strategy conform to standards & regulations, taking into account	Dust strategy describes relevant standards & regulations.		Examples of guidelines used by regulatory bodies are given in Table 3 in the booklet. Dust exposure to	

	estimates of inputs from all probable sources of dust.			workers is covered in Occupational Health & Safety legislation. It normally applies a "duty of care" on the industry to reduce risk to workers. Standards & codes of practice from relevant State authorities provide information on acceptable levels for respirable dust for dangerous materials	
1.8 Are the target levels developed in consultation with the community?	Documented agreement on maximum permissible levels between company & key community group/s	Maximum dust levels explained to & agreed with community	Establish formal & frequent consultation with the local community early in the planning process	Meaningful consultation with the local community will commonly smooth the assessment & approvals process for a new development - refer to the Community Consultation & Involvement Sustainable Minerals booklet . Community concerns extend beyond health impacts to amenity & aesthetics, such as dust clouds & deposition rates. Refer to Chapter 3 in the booklet.	
1.9 Do the provisions of the operational dust management plan	Smooth transition from operational to decommissioning stages, with low risk	Decommissioning, rehabilitation & closure plans all include provisions for control of	Plans incorporate provisions which reflect the specific activities involved at the end of mining	Higher dust levels may be permissible following consultation with regulators & the	

also apply to the mine decommissioning, rehabilitation & closure stages?	of exceedance of dust control targets	dust		community for high intensity, short-term activity such as relocation of overburden stockpiles & landforming.	
Part 2: Management and Operation - chapter 5 in Dust Control Sustainable Minerals booklet					
2.1 Have you prepared an operational dust management plan?	Dust management plan	- Management Plan sets out targets & management strategies for all issues identified in impact assessment & in community consultations - Management Plan integrated with other operational plans into an overall EMS for the project	The Environmental Management Systems Sustainable Minerals booklet describes the components of a fully integrated EMS for all environmental aspects of a minesite. Many companies seek certification to international standards such as ISO 14001 to help demonstrate their environmental commitment to regulators & other stakeholders.	Operators can use & seek certification to published EMS standards such as ISO 14000 . Software obtainable from this site includes complete prewritten procedures, record forms, & an Environment Manual which can be customised. An implementation guide is also included.	
2.2 Is the Management Plan known & understood by all staff, including plant operators?	Staff aware of the Management Plan & its contents	Relevant documentation readily available to staff, regulators & auditors	Management Plan available to staff; staff instructions on control of dust; regular checks on effectiveness of operational systems; dust included in environmental awareness training sessions	The Workforce Environmental Awareness Sustainable Minerals booklet describes general approaches to raising awareness & commitment amongst the workforce, including contractors.	
2.3 Have you selected appropriate options to minimise the generation of dust?	Few significant issues related to dust at the site	Evidence of good design to reduce dust generation through mine design, choice of equipment, & work	Use computer modelling to investigate the control measures needed to achieve targets	Primary measures to effectively minimise dust impacts include: plan operations (construction,	- establish waste dump final surfaces early - progressive revegetation

		practices • Consistent application of good design across all types of dust sources, including road transport outside the mine.		topsoil stripping, blasting, rehabilitation) to integrate dust control • plan work practices to integrate remedial measures (eg chemical additives in dust suppression, dust collection)	
2.4 Have you incorporated design features to mitigate the potential impacts from the dust generated at your site?	Few significant issues related to dust at the site	• Evidence of installation of engineering works, equipment modification etc to minimise dust • Any significant dust sources identified via monitoring have been objectively evaluated & remedial action taken	All reasonable measures taken to reduce dust from all fixed & mobile noisy equipment	Examples of original & retrofit installations include negative pressure dust hoods at transfer point, moisture adjustment of materials, automatic sprinklers, & sealing or application of suppressants to haulage roads & other dusty bare surfaces.	
2.5 Do you have operational systems to control dust in all areas with dust potential?	Procedures described in the mine plan & EIS implemented correctly, & dust control targets achieved	EMS & related manuals set out procedures for dust management in all relevant areas of the site	Documented procedures to cover: • land clearing & topsoil removal • blasting & drilling • transportation/haulage • processing, crushing &	Useful pointers are given in Case Studies: > case studies 1 & 6 > case study 8 > case study 7 > case study 3, & Tables 4, 5, & on page 16 > case studies 2, 4 & 7	

			screening • materials handling & stockpiles • dust collection • waste rock dump management • tailings dam management • residues • decommissioning • rehabilitation.	> case study 6	
2.6 Is there documentation to demonstrate that the Dust Management Plan is carried out properly?	Assurance to managers that the dust control targets for the operation are being met	Regular reports (monthly) of dust management activities & assessment against control targets & requirements of the management plan	Standard operating procedures for staff working in dusty areas, operating dusty equipment, & involved in drilling & blasting activity, setting out responsibilities, & methods for limiting & reporting dust levels & incidents.		
2.7 Do you have a system in place to incorporate improvement?	Continual improvement, & reduced probability of recurrence of undesirable dust events	Evidence of review & update of systems & equipment where unsatisfactory dust levels have been recorded	Assessment of the adequacy of dust control should be incorporated in annual environmental audits of the project.		
Part 3: Monitoring and Assessment - chapter 6 in Dust Control Sustainable Minerals booklet					
3.1 Is there a monitoring regime in place which addresses all of the possible areas for environmental & social impact from dust identified at	The level of performance of dust control & potential impacts on workers, the public & environment is well known to managers	Comprehensive monitoring regime which includes measurement of levels in worker areas & areas of community sensitivity. Monitoring regime sets out:	Reporting & record keeping includes: • recording intervals • location of attended & unattended monitoring instruments • comparison of monitoring	The Environmental Monitoring & Performance Sustainable Minerals booklet discusses design of monitoring programs.	

the planning stage?		• parameters to be monitored • monitoring locations • monitoring interval • data & data analysis requirements for monitoring reports • reporting interval	results with those from modelling		
3.2 Are environmental & community protection targets set, & are the layout, techniques, frequency, quality & sensitivity of monitoring & sampling appropriate to these targets?	Low probability of community concern provided dust is controlled to within levels agreed by community	Control targets agreed with the community are set out in the management plan & monitoring regime & are used as key benchmarks to evaluate adequacy of performance in regular monitoring reports	Tools for effective dust monitoring include: • baseline sampling - to allow comparison with the pre-mine environment • control site sampling - to allow comparison with areas unaffected by the mine during operations • dust deposition gauges - provides basic, long term data • high volume samplers - provide quantitative data over 24 hr periods but do not identify the actual dust source • continuous particle monitors - provide continuous data relevant to short term events; can operate on-line • size-selective samplers - sample dust in size fractions of particular	The Environmental Monitoring & Performance Sustainable Minerals booklet discusses how environmental performance should be measured against the objectives of the Environmental Management Plan.	The monitoring data can be fed into site dust models to predict dust levels & determines appropriate strategies to avoid significant dust events - refer Case Study 8 .

			interest personal exposure samplers - worn by workers, especially those at particular risk from dusty operations		
3.3 Is monitoring undertaken in accordance with appropriate standards?	High level of assurance of reliability of dust monitoring results	Evidence that monitoring techniques accord with appropriate national standards	Standards Australia has developed several standards for dust monitoring: - AS 2724.3 - Determination of Total Suspended Particulates (TSP) - AS 2922 - Ambient Air - Guide for the Siting of Sampling Units - AS 2985 - Workplace Atmospheres - Methods of Sampling Respirable Dust - AS 3542 - Use of Standard Ringelmann & A5 Miniature Smoke Charts - AS 3580.9.6 - PM10 High Volume Sampler with Size Selective Inlet - Gravimetric Method - AS 3580.10.1 - Deposited Matter - Gravimetric Method - AS 3640 - Workplace Atmospheres- Methods of Sampling Inspirable	Examples of the application of several dust monitoring techniques are given in Case Studies 3 & 9 .	

			Dust.		
3.4 Does monitoring include meteorological data?	Proactive management of site activities can be undertaken to avoid significant dust events in periods of bad weather, eg avoiding topsoil clearing in hot, dry & high wind conditions.	Routine collection of data on predicted rainfall, temperature & wind velocity		Case Studies 5, 6 & 8 describe how weather forecasts are used to modify activities & avoid major dust production.	
3.5 Are data collected in accordance with the requirements of the monitoring regime?	Low risk of regulatory non-compliance or of community concerns re dust	Monthly & annual reports of dust data, which cross-refer to monitoring regime requirements.			
3.6 Are the data analysed & regularly reported to the regulatory authorities?	Assurance that all regulatory requirements for dust are being met continuously	Regular reports (eg monthly) provided to regulating authority/ies.	In addition to reporting to regulatory authorities, dust control performance is reported against the community-agreed targets in public reports, including annual environmental report.		
3.7 Are non-compliance issues or abnormalities in the data routinely recorded?	• Management aware of any areas of poor performance • Management provides an ongoing measure of effectiveness of the current system & past improvements	Register of non-compliance & unplanned events, indicates time of event, time of action, type of action, result, & interaction with authorities.	Regulatory authority advised immediately of all non-compliance & significant unplanned events.		

3.8 Is there a system in place for significant dust events or issues to be addressed to reduce prospects of recurrence?	Reduced risk of recurrence of significant dust events	Evidence that entries in the register of non-compliance & unplanned events are investigated properly & appropriate remedial action is identified & implemented promptly	Standard deadline set for completion of actions to remedy dust events. Number of entries in the register, & speed of actioning improvements, can be used as reporting criteria to staff, management, regulators & community.		
3.9 Is liaison with the community maintained in relation to dust issues?	Good community relationships maintained	Documentation of regular community liaison meetings which address dust	Community meetings held regularly with dust a standing agenda item; special meetings held immediately after a significant event raising community concern.	The Community Consultation & Involvement Sustainable Minerals booklet gives more information on community consultation issues & techniques.	
3.10 Is a complaints register maintained & are complaints investigated?	• Areas of poor dust control are addressed quickly so that risk of recurrence is minimised • good community relationships maintained.	Documented complaints register which records details of complaints & any follow-up action	• Register records date, time, & type of event which is the subject of the complaint; follow-up action, risk of recurrence • reporting back to complainant.		

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