

# ENVIRONMENTAL AUDIT CHECKLIST

Audited Mine:

Audit Team:

Audit Date(s):

Mine Manager:

Mine Representative/s:

Previous Audit Date:

## AUDIT ITEM

## RESPONSE

## COMMENTS

YES

NO

UNCERTAIN

### 1. COMPANY ENVIRONMENTAL POLICY

- a. Does the controlling company have a stated environmental policy?
- b. Has this been communicated internally?
- c. Has this been communicated externally?
- d. Do the policies on environmental issues adopt a cradle-to-grave philosophy?
- e. Do they conform with the guidelines and standards of other (local or International) organisations?
- f. Does the environmental policy form an integral part of the organisation's business and management strategy?
- g. Do any of the Mine customers insist that the Mine adhere to certain environmental standards?
- h. Does the Mine insist that its suppliers adhere to accepted environmental standards
- i. Does the company review changes in environmental legislation?

AUDIT ITEM	RESPONSE			COMMENTS
	YES	NO	UNCERTAIN	
<b>2. ENVIRONMENTAL MANAGEMENT SYSTEMS</b>				
<b>2.1 Environmental Management Structures and Staffing</b>				
a. Is an environmental management structure in place?				
b. Does the environmental management structure provide for : -Land Rehabilitation -Air Quality Management -Water Quality Management -Waste Management -Environmental Communication -Environmental Legal Monitoring (Who is responsible for each of these tasks?)				
c. Does the Mine have sufficient manpower to successfully manage its EMP?				
d. Do staff employed in environmental roles have the necessary training and experience to do the job expected of them?				
e. Is one person responsible for environmental administration? -who is this person? -to whom does this person report? -how long has this person held this position? -what other responsibilities does this person have? -what environmental qualification does this person have?				
j. Are environmental responsibilities written into the general job descriptions of these people?				
<b>2.2 Environmental Management Programme</b>				
a. Has the EMP been accepted by the relevant authorities?				
b. Does the accepted EMP adequately address the environmental problems on the mine?				
c. Is the EMP being implemented according to schedule?				

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	YES	NO	UNCERTAIN	
<b>2. <u>ENVIRONMENTAL MANAGEMENT SYSTEMS (Cont.)</u></b> <b>2.2 <u>Environmental Management Programme (cont.)</u></b> d. Does the Mine have regular internal performance reviews regarding the EMP? <b>2.3 <u>Education and Training</u></b> a. Is there a programme on the mine to improve the environmental awareness of staff? (who is responsible for this?) b. Is there a formal environmental manual covering : - all operating and maintenance tasks on site? - training and refresher courses for every task? - emergency response procedures? - legislation pertaining to an employee's job? c. How often is the manual reviewed and updated, and by whom? <b>2.4 <u>Internal and External Communication and Reporting</u></b> a. When necessary, does the Mine notify the appropriate external agencies/government departments of pollution incidents? b. Does the Mine keep an up to date register of all pollution incidents? (who is responsible for keeping this register?) c. Does the Mine keep a complaints register to record all complaints from outside complainants (I&As)? (who keeps the register?) d. Does the Mine have an open channel of communication with interested and affected parties? e. Has this been communicated to the I&As? (form of communication?) f. Does the Mine have a regular environmental audit? (nature and frequency of audits?)				

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<b>2. ENVIRONMENTAL MANAGEMENT SYSTEMS (Cont.)</b> <b>2.5 Planning and Resources</b> a. Has the mine made any recent changes to the mine plan? b. If so, has the mine made the appropriate changes to the (EMPR)(management programme)(mining permit) and the associated detailed plans? c. Have these modifications been accepted by the recognised government authority? d. Does the mine have plans of: <u>Pre-mining plans (open-cast, shafts and minipits)</u> -geology -topography -surface infrastructure -soil type, depth and distribution -land capability -land use -surface water flow with 1:50 yr flood lines -water balance -vegetation distribution  <u>Post-mining plans</u> -final topography and drainage -soil type, depth and distribution -land capability -land use -vegetation e. Does the work plan in the annual budget cater adequately for the environmental work needed in the current fiscal year? f. Were the previous budget objectives achieved? g. Are there sufficient funds to do the work planned in the current fiscal year? h. Does the Mine have a pollution control fund? Amount? i. Are audited statements of the mine's pollution control fund available? j. Does the pollution control fund adequately provide for the rehabilitation work/pollution control measures required at the final closure of the mine?				

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<b>2. ENVIRONMENTAL MANAGEMENT SYSTEMS (Cont.)</b> <b>2.5 Planning and Resources (cont.)</b> k. Do closure plans provide for the following : -demolition of headgear -removal of concrete foundations -removal of old brickwork -decisions on the removal, sale or retention of buildings -removal of pipeline and plants -removal of powerlines -removal of telephone lines -retention or removal of roads and railways -closing off of shafts (vertical and inclined) -fencing and filling of sinkholes -fencing of caving ground -closing of dumps and tailings dams -disposal of waste rock dumps -minimisation of acid drainage -closure of domestic waste dumps -removal of machinery -rehabilitation of the terrain and revegetation? -maintenance of rehabilitated areas  <b>2.6 Record keeping and document &amp; data control</b> a. Is a procedure in place for controlling all environmental data, records and documentation?				

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<b>3. <u>LEGAL STANDARDS</u></b>  a. Is the mine kept aware of its environmental liabilities? (How?)  b. Are copies of all appropriate statutes, regulations and bylaws readily available on the mine?  -Where are they kept? Who updates them?  c. Does the Mine comply with the relevant legislation and regulations?  d. Are copies of all permits, exemptions, relaxations and other pertinent legal documents kept by the Mine?  e. Are these permits current/valid? Who is responsible for monitoring the permits?  f. Is there a list of all the legal standards with which the Mine needs to comply?  g. Does the Mine regularly negotiate standards with the authorities and jointly review performance on a regular basis?  h. Does the Mine have a list of principal contacts with regard to legal compliance in the case of :  -Minerals ministry -Water ministry -Environment ministry -Agriculture ministry -Health ministry -Relevant provincial administration -Local authorities -Police -Emergency services (fire etc)				

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	YES	NO	H/M/L?	1 - 5?		
<b>4. ENVIRONMENTAL PERFORMANCE</b> <b>4.1 Land Management</b> <b>4.1.1 Soils</b> a. Is topsoil stripped to the correct depth? (who monitors this?) b. Is topsoil replaced to the correct depth and position? (who monitors this? frequency?) c. Are soil movement records up to date? d. Are soil records reviewed at weekly planning meetings? e. Are topsoils and subsoils stockpiled separately? f. Are topsoil stockpiles placed in the correct locations? g. Are these protected where necessary from contamination by discards or polluted waters? h. Does the Mine have a soil balance? (with volumes reconciled?) i. Is the soil balance reviewed regularly? (how often?) j. Have all available areas of reshaped spoil been topsoiled? k. Do rehabilitation practices prevent soil loss by erosion in unmined and rehabilitated areas?						

**MAGNITUDE OF IMPACT** (short/medium/longterm; s/m/l)

H = HIGH IMPACT (e.g. Hs/Hm/Hl)

M = MEDIUM IMPACT

L = LOW IMPACT

**PERFORMANCE RATING:**

1 = Poor - urgent remedial action essential

2 = Substandard – remedial action necessary

3 = Average – improvement advised

4 = Good - maintenance required

5 = Excellent - minimal maintenance required

AUDIT ITEM	COMPLIANCE WITH STANDARDS		MAGNITUDE OF IMPACT	PERFORMANCE RATING	DATE FIRST REPORTED	COMMENTS
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<b>4. ENVIRONMENTAL PERFORMANCE (Cont.)</b> <b>4.1 Land Management (cont.)</b> <b>4.1.1 Soils</b> l. Do any rehabilitated areas show signs of soil erosion? (if so, what is being done to minimise this?) m. Has stone picking been carried out on topsoiled areas? n. Have soil samples been taken of topsoil in rehabilitated areas to determine required fertilization/liming rates? <b>4.1.2 Topography</b> a. Are spoils reshaped according to plan? b. Do rehabilitated areas drain according to plan? c. Have any areas of rehabilitated land subsided so as to pond water? (if so, what is being done to rectify this?) d. Are records kept of dozer hours spent on spoil levelling? e. Have available ramps and final voids been infilled? f. If not, do plans exist for dealing with these areas? (elaborate) <b>4.1.3 Revegetation/pastures</b> a. Have all topsoiled areas been revegetated? (what soil amelioration was done and what seed mix was used?) b. Have old roads been rehabilitated? (how ?) c. If not, is there a plan for this? (elaborate) d. Have all borrow-pits been rehabilitated? (was this done according to plan?) e. Have vegetation assessments been done on revegetated areas? (by whom? frequency?)						
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	COMPLIANCE	MAGNITUDE	PERFORMANCE	DATE FIRST	COMMENTS
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AUDIT ITEM	WITH STANDARDS		OF IMPACT	RATING	REPORTED	
	YES	NO	H/M/L?	1 - 5?		
<b>4. ENVIRONMENTAL PERFORMANCE (Cont.)</b> <b>4.1 Land Management (cont.)</b> <b>4.1.3 Revegetation/pastures (cont.)</b> f. Are the pastures maintained? (how? - grazing, mowing, burning, etc?) g. Are detailed records kept of the production from rehabilitated areas? (elaborate) h. Are any rehabilitated areas put to arable use? (ha?) i. Is a record kept of production? (what is done with the crop?) j. Are pastures on rehabilitated areas sustainable? (criteria used?) k. Are remedial measures taken to improve poorly vegetated areas on rehabilitated land? l. Does the mine have standard systems for soil fertilisation? m. Are records in these respects kept up to date? n. Have these records been reviewed? o. Have follow-up soil analyses been done on rehabilitated areas to determine optimal (efficient) levels of fertiliser required? p. Have any pastures had fertility withdrawn from their maintenance programme? (period?) <b>4.1.4 Revegetation/trees</b> a. Has any tree planting been done on the mine? If so: -what species? (what area has been planted?) -what were the principal reasons for planting trees -who planted the trees -who maintains the plantations? b. Has the tree planting been done according to a plan?						
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AUDIT ITEM	STANDARDS					
	YES	NO	H/M/L?	1 - 5?		
<b>4. ENVIRONMENTAL PERFORMANCE (Cont.)</b> <b>4.1 Land Management (cont.)</b> c. Has the plan been approved? (by whom?) d. Has tree survival been assessed (by whom? frequency?) e. Does management of the plantation include : - fertilization - weed control - timber harvesting - fire prevention - pest control? <b>4.1.5 Weed control</b> a. Does the Mine have a weed problem? b. Are any of the weeds classified as "declared weeds"? (name them) c. Has an independent assessment been made of the extent of the problem regarding alien invader species? d. Does the mine have a programme for weed control? e. Will this programme effectively control weeds? f. Does the mine involve external agencies to assist with weed control? (who was used?) g. Does the Mine have the resources (manpower & finance) to control the weed problem?						
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<b>4. ENVIRONMENTAL PERFORMANCE (Cont.)</b> <b>4.2 Water Management (cont.)</b> <b>4.2.1 Water monitoring</b> a. Is there an approved schedule of sampling for: -surface water -groundwater b. Are these schedules adhered to? c. Is sampling done by the mine?: d. Is one person responsible for the sampling? Who? e. Are samplers checked to ensure that they are sampling correctly? (how frequently) f. Does the mine have any continuous water monitoring stations? (how many?; plan of their location?) g. Does the mine handle its continuous monitoring data? (if not, who does?) h. Does the mine monitor water flow volumes in all streams? i. Does the mine monitor water flow volumes in all pipelines? j. Is there a potential for pollution of any of the aquifers from polluted surface water impounded in streams, return water dams, evaporation ponds etc? k. Have all other potential sources of groundwater pollution been identified? l. Are all relevant aquifers monitored? m. Are boreholes correctly constructed to monitor the relevant aquifers?						
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<b>4. ENVIRONMENTAL PERFORMANCE (Cont.)</b> <b>4.2 Water Management (cont.)</b> <b>4.2.1 Water monitoring (cont.)</b> n. Are water levels monitored in: - all aquifers - underground workings - spoils? o. Is all relevant water quality, quantity, and water level data captured? <b>4.2.2 Sampling procedure and water analysis</b> a. Does the mine have a set of standard procedures for sampling: - surface waters - groundwater? b. Are field pH & EC measurements made when grab samples are taken? c. Does the mine have the equipment to sample boreholes correctly? d. Are water samples sent to a laboratory for analysis? (which one?) <b>4.2.3 Water balance</b> a. Has a water balance been drawn up for the mine? (who did this and how often is it updated?) b. Does the water balance contain flow and chemical balances? c. Is the water balance used to reduce raw/potable water consumption? d. Has a programme been implemented to optimise water consumption on the mine? (detail?) e. Is a record kept of the volumes of all water (polluted/raw/potable) pumped on the mine?						
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<b>4. ENVIRONMENTAL PERFORMANCE (Cont.)</b> <b>4.2 Water Management (cont.)</b> <b>4.2.3 Water balance</b> f. Are these records regularly captured? (frequency?) g. Is any process water recycled? h. Has the plant achieved a zero discharge? (is zero discharge possible?) <b>4.2.4 Pollution prevention</b> a. Is there effective clean and dirty water separation on the mine? b. Does the mine meet regularly to discuss pollution control? (if so, how often?) c. Have pollution control measures been implemented to minimise the potential for affected waters to contaminate rivers and streams? d. Are all polluted surface waters effectively contained on mine property? e. If not, does the mine have a permit for discharge? f. Are the 1:50 yr flood levels for streams in the mine catchment known? (plan?) g. Have pollution control dams, slimes dams, and discard dumps been designed and constructed so as to minimise groundwater contamination? (how?) h. Will detention structures (dams, reservoirs, sediment pans, etc.) cope with a 1:50 yr design flood? (if not, what contingency plans have been implemented?) i. Does the mine manage detention structures to cope with the 1:50 yr flood event? (how?)						
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<b>4. ENVIRONMENTAL PERFORMANCE (Cont.)</b>						
4.2 <b>Water Management (cont.)</b>						
4.2.4 <b>Pollution prevention (cont.)</b>						
j. Has the mine installed a stream diversion? (permit?)						
k. Has the stream diversion been designed to cope with a 1:50 yr flood?						
l. Has it coped with all flood events to date?						
4.2.5 <b>Pollution abatement</b>						
a. Where possible, does the mine collect and lime all acid mine drainage?						
b. Is this neutralised water discharged into any rivers or streams? (permit)						
c. Are any other techniques used to improve the quality of affected waters? (RO, etc?)						
d. Have these techniques been approved by the relevant authorities?						
e. Are any natural wetlands negatively impacted by polluted mine effluents?						
f. Are the natural wetlands being properly managed?						
g. Are there plans to reinstate any lost wetlands?						
h. Are any natural wetlands used for the abatement of pollution? (were these reinforced?)						
i. Is the beneficial impact of wetlands on affected mine effluents being monitored?						
4.2.6 <b>Water purification plant</b>						
a. Is a record kept of the volumes of water treated?						
b. Is the quality of raw water and treated water tested frequently to ensure safe potable water?						
c. Is the quality of raw water and treated water tested frequently to ensure safe potable water?						

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<b>4. ENVIRONMENTAL PERFORMANCE (Cont.)</b> <b>4.3 Waste Management (cont.)</b> <b>4.2.6 Water purification plant (cont.)</b> d. Are potable water reservoirs sealed and maintained to prevent contamination of the clean water supply? e. Is backwashed sludge contained on site? (if not, where is this disposed of?) f. Is the general maintenance and housekeeping of the facility acceptable? g. Does the facility meet all the necessary safety requirements? <b>4.3 Waste Management</b> <b>4.3.1 Discard and slimes waste disposal</b> a. Does the Mine have any discard dumps, slimes dams or combined facilities - how many? <b>Note:</b> <i>In the event that a Mine has more than one facility, pages 17 &amp; 18 are reproduced to provide a set of questions for each facility</i> b. Was the facility designed by a qualified engineer? (if so, who?) c. Is the design suitable in terms of stability and side slope characteristics? d. Does the design provide for life of mine requirements? e. Does the site have potential for expansion? (if not, is there a potential future site earmarked for discard/slimes disposal?)						
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<b>4. ENVIRONMENTAL PERFORMANCE (Cont.)</b> <b>4.3 Waste Management (cont.)</b> <b>4.3.1 Discard and slimes waste disposal (cont.)</b> u. Does the facility have a clean water cut-off trench to protect it from storm water? v. Does the facility have effective dirty water cut-off trenches to intercept polluted water? w. Is all dirty water from the facility contained for further use or evaporation? (how is it contained?) x. Have sufficient monitoring boreholes been put in to determine if the facility is having an impact on groundwater quality? y. If not, are plans in place for additional boreholes? z. Have all defunct/disused facilities been rehabilitated? (if not, are there plans to do so?) aa. Will rehabilitation (cladding and revegetation) of the facility begin during the operational phase? ab. Is there sufficient topsoil available/stockpiled for rehabilitating the facility at closure? (how determined? by whom?) <b>4.3.2 Domestic waste disposal</b> a. Is waste stored and transported in accordance with accepted health standards? (what method is used for the disposal of domestic waste?) b. Is domestic waste disposed of on the mine? (no. of sites?) c. If waste is disposed "off-mine", is contractor performance checked? (by whom?) d. Does the mine have a valid permit for their disposal site/s from the Dept of Water Affairs? e. Is domestic waste compacted and covered daily with a layer of soil (sanitary landfill)? f. Is the disposal site fenced?						
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<b>4. ENVIRONMENTAL PERFORMANCE (Cont.)</b> <b>4.3 Waste Management (cont.)</b> <b>4.3.2 Domestic waste disposal (cont.)</b> g. Have clean water cut-off trenches been put in to prevent clean water runoff from flooding the site? h. Has a geohydrological study been done to determine the potential of the facility to pollute the groundwater? i. Is refuse burnt at the disposal site? j. Is indiscriminate dumping controlled on the property? (how?) <b>4.3.3 Sewage waste disposal</b> a. Is action taken, when appropriate to address identified problems? b. Has written approval been obtained as to the manner of sewage sludge disposal? c. Is sewage waste (sludge) disposed of in the approved manner? (who checks?; how often?) d. Are all sewage pipelines (and manholes) delivering raw sewage to the plant intact? e. Are these inspected regularly? (how often?; by whom?) f. Has consideration been given to using sewage sludge to fertilise rehabilitated areas? <b>4.3.4 Toxic materials handling</b> a. Has the mine generated a list of toxic chemicals that might be handled on the mine? b. Is this list reviewed as new items are purchased?						
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	YES	NO	H/M/L?	1 - 5?		
<b>4. ENVIRONMENTAL PERFORMANCE (Cont.)</b> <b>4.3 Waste Management (cont.)</b> <b>4.3.4 Toxic materials handling (cont.)</b> c. Does the mine produce any waste classified as hazardous waste (i.e. substances which may cause injury to humans by reason of their toxic, corrosive, irritant, sensitising or flammable nature?) d. Is an inventory kept of all medical and toxic waste disposed by the mine? (how is this stored, who moves it and where to?) e. Are pollutants such as grease, oil and degreasing fluids handled in such a way as to prevent environmental pollution? f. Are procedures in place to cater for spills? g. Are different waste classifications used in sorting, storing and transporting toxic waste? (e.g. flammable, corrosive, toxic, biodegradable) h. Are toxic wastes disposed of through an approved waste disposal company? (who is used?) <b>4.3.5 Waste Reduction &amp; Recycling</b> a. Is an inventory kept of all wastes generated, treated or disposed of? b. Does the Mine buy, where possible, materials that are biodegradable? c. Are approved products purchased where possible? d. Does the company buy "ozone-friendly" (CFC-free) products, e.g. refrigerants, propellants, fire extinguishing materials, etc.?						
<div> <b>MAGNITUDE OF IMPACT</b> (short/medium/longterm; s/m/l)  H = HIGH IMPACT (e.g. Hs/Hm/Hl)  M = MEDIUM IMPACT  L = LOW IMPACT </div> <div> <b>PERFORMANCE RATING:</b>  1 = Poor - urgent remedial action essential  2 = Substandard - remedial action necessary  3 = Average - improvement advised  4 = Good - maintenance required  5 = Excellent - minimal maintenance required </div>						

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	YES	NO	H/M/L?	1 - 5?		
<b>4. ENVIRONMENTAL PERFORMANCE (Cont.)</b> <b>4.3 Waste Management (cont.)</b> <b>4.3.5 Waste Reduction &amp; Recycling (cont.)</b> e. Is all packaging sorted into disposable and recyclable piles? f. Is all recyclable waste sent for recycling? g. Are waste product recycling plans in place for disposing of: - paper - metal - glass - oil - discard material? <b>4.4 Animal Life and Plant Life</b> a. Does the mine have a programme to regularly evaluate changing diversity on rehabilitated land? b. Have any attempts been made to encourage an increase in the abundance and diversity of plants, animals and habitats on unmined and rehabilitated land? c. Does the mine monitor changing biodiversity in mine streams? d. Has the mine encouraged habitat diversity through wetland creation? e. Do any surveys show that biota have been negatively impacted by mining? f. If so, has the mine taken action to rectify this? (explain?) g. Has the mine attempted to improve biodiversity on rehabilitated land by relocating plant and animal species from planned mining areas to post-mining land?						
<div> <b>MAGNITUDE OF IMPACT</b> (short/medium/longterm; s/m/l)  H = HIGH IMPACT (e.g. Hs/Hm/Hl)  M = MEDIUM IMPACT  L = LOW IMPACT </div> <div> <b>PERFORMANCE RATING:</b>  1 = Poor - urgent remedial action essential  2 = Substandard - remedial action necessary  3 = Average - improvement advised  4 = Good - maintenance required  5 = Excellent - minimal maintenance required </div>						

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	YES	NO	H/M/L?	1 - 5?		
<b>4. ENVIRONMENTAL PERFORMANCE (Cont.)</b> <b>4.5 Air Quality</b> a. Are dust and fume impacts visible to the public? b. Does the mine have a register to record dust complaints? (who keeps this?) c. Is air quality regularly monitored on the mine? (who does this and how often?) d. Is a report generated of the results? (is this available?) e. Are the dust monitoring reports regularly reviewed? (by whom?) f. Does air quality meet the required standards? g. Is dust from the following facilities effectively controlled: -plant -haul roads -ROM tips -conveyor transfer points -silos -slimes dams -spoil piles -coal stockpiles -discard dumps? (if not, what plans have been drawn up to address the problem?) h. Are work places properly ventilated? i. Do any facilities on the mine produce noxious fumes? (if so, identify these) j. Have proper filtering systems been installed to control dust and fumes where these occur? k. Does the mine store or use any chemicals that may or do pollute the air? (if so, list these)						
<div> <b>MAGNITUDE OF IMPACT</b> (short/medium/longterm; s/m/l)  H = HIGH IMPACT (e.g. Hs/Hm/Hi)  M = MEDIUM IMPACT  L = LOW IMPACT </div> <div> <b>PERFORMANCE RATING:</b>  1 = Poor - urgent remedial action essential  2 = Substandard - remedial action necessary  3 = Average - improvement advised  4 = Good - maintenance required  5 = Excellent - minimal maintenance required </div>						

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<b>4. ENVIRONMENTAL PERFORMANCE (Cont.)</b> <b>4.5 Air Quality</b> I. Do staff wear the proper protective equipment when dealing with dangerous solids, liquids or gases? <b>4.6 Noise and Vibration</b> a. Have potential sources of noise and vibration been evaluated on the mine? b. Have reports been generated of the results? (are these available?) c. Are the noise/vibration reports regularly reviewed? (by whom?) d. Are plans and standard procedures in place to control noise and vibration?						
<div> <b>MAGNITUDE OF IMPACT</b> (short/medium/longterm; s/m/l)  <i>H = HIGH IMPACT (e.g. Hs/Hm/Hl)</i>  <i>M = MEDIUM IMPACT</i>  <i>L = LOW IMPACT</i> </div> <div> <b>PERFORMANCE RATING:</b>  <i>1 = Poor - urgent remedial action essential</i>  <i>2 = Substandard - remedial action necessary</i>  <i>3 = Average - improvement advised</i> </div> <div> <i>4 = Good - maintenance required</i>  <i>5 = Excellent - minimal maintenance required</i> </div>						

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