

**MANDATORY CODE OF PRACTICE
FOR AN OCCUPATIONAL HEALTH PROGRAMME FOR
NOISE**

Name of Mine

TITLE PAGE

1. Mandatory code of practice for an occupational health programme on personal exposure to noise in the workplace
2. Name of mine:
3. Mine Reference number:
4. Effective date:
5. Revisions:

Date of revision	Reasons for revision	Results of revision

6. This COP was drawn up in accordance with guideline Department of Minerals and Energy Reference Number DME 16/3/2/4-A3 issued by the Chief Inspector of Mines

TABLE OF CONTENTS

1. Status of mandatory code of practice	4
2. Members of drafting committee	4
3. General information about the mine	4
4. Terms, definitions and abbreviations used in this code of practice	5
5. Risk management	5
6. Occupational hygiene programme	6
7. Occupational medical surveillance programme	10
8. Aspects of a hearing conservation programme	11
9. Recordkeeping	13
10. Implementation	13

1. STATUS OF MANDATORY CODE OF PRACTICE

- 1.1 This Code of Practice was drawn up in accordance with Guideline DME Reference Number, DME 16/3/2/4-A3, issued by the Chief Inspector of Mines
- 1.2 This is a mandatory Code of Practice in terms of section 9(2) and (3) of the MHSA.
- 1.3 The COP may be used in an accident investigation/inquiry to ascertain compliance and also to establish whether the COP is effective and fit for its purpose.
- 1.4 The COP supersedes all previous relevant COPs.
- 1.5 All managerial instructions, recommended procedures (voluntary COPs) and standards on the relevant topics must comply with the COP and must be reviewed to ensure compliance.

2. MEMBERS OF DRAFTING COMMITTEE

The members of the drafting committee for this COP was:

Name	Designation

3. GENERAL INFORMATION ABOUT THE MINE

3.1 Name of mine: Name
Physical Address
Postal Address

3.2 Brief description of mine:
The mine consists of an opencast clay mining area and a production plants where clay is crushed, extruded and fired for the manufacturing of bricks.

3.3 Location of Mine:
...

3.4 Commodity produced by Mine:
Bricks for building and construction purposes.

3.5 Mining methods used for production process:
a. Machinery used within the mine
Mining within the quarry is done using a bulldozer and clay is removed with a front-end loader and transported to the factory with Tipper trucks. The crushing and grinding section is mechanized with crushers, rollers and conveyor belts. An extruder and cutter are used to make the bricks

which are packed by hand and then fired within tunnel kilns. Within the stock and sales yard, forklifts are used to load pallets of bricks onto trucks.

b. Potential noise sources

High potential noise sources are found in the crushing and grinding, extrusion area and on top of the Kiln and Dryers.

3.6 Existing controls

All possible engineering controls are in place to minimise noise levels for all potential noise sources. All employees within noise areas are issued with personal protective equipment.

3.7 Existing COPs

No previous COPs are in place

3.8 Unique mine features affecting the risk assessment conducted

No unique features exist that would affect the risk assessment.

4. TERMS, DEFINITIONS AND ABBREVIATIONS USED IN THIS CODE OF PRACTICE

COP	Code of Practice
MHSA	Mine Health and Safety Act
AQI	Air quality index for the pollutant
DME	Department of Minerals and Energy
OEL	Occupational Exposure limit
HCP	Hearing Conservation Programme
HEG	Homogeneous Exposure Groups
The Mine	Name of Mine
SAIOH	South African Institute of Occupational Health
SAMOHP	South African Mines Occupational Health Programme
Risk Assessment	Determination of the extent of a real or perceived risk to the health of a worker
SABS	South African Bureau of Standards

5. RISK MANAGEMENT

- 5.1 The mine uses a qualified occupational hygienist to assess the health and safety risks, relating to noise, that employees are exposed to at work. Significant hazards are identified and recorded and a record of this is kept at the mine.
- 5.2 Noise levels are recorded in dB for an 8 hr period under the following categories:
- Insignificant risk < 82dB
 - Action level > 82dB but < 85dB – the level at which management must take action to protect the hearing of workers
 - Significant risk >85dB
 - Unacceptable risk >96dB

- 5.3 In addressing noise levels that pose a health and safety risk to employees, the mine, together with the occupational hygienist, will:
- first attempt to implement methods to eliminate the risk;
 - thereafter to control the risk at source;
 - thereafter to minimise the risk; and
 - thereafter, insofar as the risk remains, to provide personal protective equipment and to institute a programme to monitor the risk.
- 5.4 To assist the mine with the risk assessment, all possible relevant information such as health statistics, ergonomic studies, research reports, manufacturers' specifications, approvals, design criteria and performance figures for all relevant equipment will be obtained and considered by the occupational hygienist.
- 5.5 In addition to the periodic review required by section 11(4) of the MHSA, the COP should be reviewed and updated after significant changes are introduced to procedures, mining and ventilation layouts, mining methods, plant or equipment and material.

6. OCCUPATIONAL HYGIENE PROGRAMME

The following key elements will be included in the occupation health programme:

- Noise assessment and control
- Personal exposure monitoring
- Education and training
- Hierarchy of controls
- Medical surveillance
- Reporting and reviewing

The following flow chart, issued by the DME, illustrates how these key elements are to interact with one another:

6.1 **NOISE ASSESSMENT AND CONTROL**

6.1.1 Description of noise assessment process

- a. Noise assessment is done according to procedures and specifications as set down by the Occupational Hygienist in accordance with requirements as laid down by the MSHA and the Inspector of Mines.
- b. Noise levels are measured in the legally required noise unit of decibels, equivalent noise level taken on the A-weighting scale, i.e. dB(A) Leq. This is an integrated noise level taken over an extended time period.
- c. Noise levels are measured using a Bruel & Kjaer Integrating Impulse Sound Level Meter, Model 2226. A Quest Acoustic Calibrator is used to calibrate the noise level meter before and after the survey. A wind shield is used to protect the microphone during the survey.
- d. Noise measurements are done using site assessments rather than personal assessments, i.e. the noise within a site is measured and not the noise a particular worker is exposed to.

6.1.2 Description of activity areas

- a. The activities during which employees may be exposed to significant noise sources are:
 - Crushing and grinding of clay
 - Extrusion of clay
 - Kiln and Dryers operation
- b. Noise levels are generally related to machinery used in these processes.
- c. The workplace operations and activities that pose the greatest potential for exposure to noise are:
 - Crushing and grinding of clay
 - Extrusion and cutting of bricks
 - Kiln and Dryers operation
- d. The following occupations can cause exposure to significant noise levels, i.e > 82dB

Occupation	No. of workers exposed
Crushing & grinding	3
Extrusion & cutting of bricks	2
Kiln and Drying	8

- e. The pattern of exposure to noise within these areas are continuous over a full working shift.
- f. Two previous surveys have been conducted to measure noise levels at the mine. The results are as follows:

Date	Activity	Actual measured concentration	Legal OEL
09/07/2003	Kiln	80.5 – 86 dB	> 85 dB
	Dryer	81 – 86 dB	> 85 dB
09/07/2003	Extruder	84 – 86 dB	> 85 dB
	Cutter	83 – 89 dB	> 85 dB
09/07/2003	Setters	78 – 80 dB	> 85 dB

09/07/2003	Sorters	80 – 81 dB	>85 dB
09/07/2003	Workshop - Welding	75 dB	>85 dB
	Workshop - Grinding	97 dB	>85 dB
09/07/2003	Bell Front-end Loader	81 dB	>85 dB
	Linde Forklift	72 dB	>85 dB

- g. Control measures in place:
- Engineering controls are considered adequate
 - Approved hearing protection are issued to employees within noise zones
 - Noise areas are clearly demarcated
 - Employees are educated regarding the hazards of noise and the proper use of hearing protection
- h. Ongoing noise monitoring takes place annually to assess the effectiveness of the controls in (g) above.

6.2 **DETERMINATION OF HEG'S**

- a. HEG's are identified on the mine for purposes of personal exposure monitoring.
- b. The main areas of activity in which workers are exposed to noise are:
- i. Crushing and grinding of clay
 - ii. Extrusion and cutting of bricks
 - iii. Kiln and Drying.
 - iv. Other areas such as packing, sorting, etc. have insignificant noise levels (since the last survey in 2003)
- c. Noise assessments are done within each of these activity areas and compared to legal limits for noise.
- d. Each area of activity is measured during the course of a survey according to a plan which clearly indicates the positions of measurements.
- e. HEG's are determined based on the range of noise measurements taken within an activity area. This is ascribed to all workers working within that activity area.
- f. Classification of an activity area as a noise zone and issuing of personal protective equipment is based upon the highest measurement within an activity area.
- g. HEG classification will be re-assessed under the following circumstances:
- Where exposure levels indicate a consistent improvement or deterioration in noise levels within an activity area;
 - Where employee complaints are received;
 - Where changes are made in procedures, methods, equipment or materials;
 - Where a trend in deterioration of hearing loss is detected;
 - Where other events warranting reclassification occur.

6.3 **PERSONAL NOISE EXPOSURE MONITORING**

- a. Personal exposure monitoring will be conducted on an annual basis in compliance with regulation 9.2(7).
- b. In order to ensure meaningful and accurate samples, a qualified occupational hygienist is appointed to monitor noise levels.
- c. Measurements taken within an activity area are assigned to all employees working within that HEG.
- d. No additional samples are needed to ensure confidence in the reliability of results with regards to classification of the HEG.

6.4 **MEASURING METHODOLOGY AND QUALITY CONTROL**

6.4.1 Methodology

- i. The methodology used for measurement of noise levels will be determined by the appointed occupational hygienist in accordance with international standards and guidelines as set down by the MHSa and the DME.
- ii. Instruments used will be calibrated in accordance with international standards on a regular basis and the occupational hygienist must include calibration certificates in the annual survey report.
- iii. The occupational hygienist will have in place and follow the requirements of a quality control programme defined under SABS Code 0259 – A Quality Control Management Code of Practice for occupational hygienists.

6.4.2 Monitoring strategy

- i. Annual monitoring of areas of activity will take place in all activities where noise has been identified as a hazard.
- ii. Follow-up monitoring may take place where improvements have been made to determine the extent of improvements or where medical results indicate the need for a follow-up measurement.
- iii. Records of all surveys and assessments will be kept on file with the company for a period of at least 5 years.

6.4.3 Base-line surveys

A base-line survey will be carried out every two years to re-assess the classification of areas as noise zones.

6.5 **REPORTING AND RECORDING**

Records and reports of all activity area assessments will be kept at the mine for at least 5 years. Records shall include the following:

- a. Major noise sources and factors leading to over exposure of employees
 - Controls not operating effectively
 - Events of factors that have influenced the results of the assessment.
- b. Hierarchy of controls initiated
 - Elimination of hazard by rotation of workers in high risk areas
 - Engineering controls to improve noise levels of machinery and equipment – i.e. partial enclosure of machinery
 - Safety practices implemented and adhered to.
 - Approved personal protective equipment issued and workers educated and counselled regarding proper use.

7 OCCUPATIONAL MEDICAL SURVEILLANCE PROGRAMME

7.1 MEDICAL SURVEILLANCE PROGRAMME

- a. The medical surveillance programme is introduced on the mine to ensure that employees are:
 - fit to perform work related to the risks or hazards they would be exposed to within that position;
 - screened at regular intervals to identify early signs of occupational illnesses arising from the health hazards they are exposed to at work;
 - examined upon leaving their employment with the mine to determine whether they have any medical condition that could be ascribed to health hazards related to exposure at the mine.
- b. Medical surveillance with respect to noise hazards will be conducted in terms of Regulation 11.4(2).

7.2 CATEGORIES OF MEDICAL EXAMINATIONS

7.2.1 Baseline audiogram

An employee who enters the mining industry for the first time, must be given a baseline audiogram. This is recorded and kept on his record. Where an employee has worked at another mine such audiogram will be considered an initial audiogram.

7.2.2 Periodic audiogram

Periodic audiograms will be conducted annually with all employees subject to medical surveillance.

7.2.3 Exit audiogram

Upon leaving employment at the mine, an exit audiogram will be conducted. The employee will be given an exit medical certificate and a copy will be kept on the employee's file.

7.3 MEDICAL SURVEILLANCE ACCORDING TO THE NOISE HAZARD

A system of medical surveillance has to be linked with the presence of hazards at the mine. This requires that the Occupational Medical Practitioner of the mine has all the information regarding hazards that employees are exposed to and can identify links between medical information of employees and the hazards they are exposed to.

8 ASPECTS OF A HEARING CONSERVATION PROGRAMME

The mine has implemented a hearing conservation programme to ensure that employees are not exposed to noise levels in excess of 85dB and to reduce the risk of noise-induced hearing loss. The hearing conservation programme will entail controlling the noise at source as the most important priority. Where noise levels cannot be reduced further, administrative controls and personal protection will be implemented.

8.1 **Structure of hearing conservation programme (HCP)**

8.1.1 Development and implementation

The HCP has been developed by the mine and will be implemented in conjunction with the Health and Safety Committee.

8.1.2 System of review

The HCP will be reviewed by the mine and the Health and Safety Committee under any circumstances which finds it to be inadequate to reduce the risk of noise-induced hearing loss. These may include:

- Complaints by employees;
- Where a trend in deterioration of hearing loss is detected;
- Under guidance or proposal from the Occupational Hygienist or the Occupational Medical Practitioner;
- Where other events warranting review occur.

8.2 **Noise measurement for risk assessment**

8.2.1 Measurement of noise and noise exposure

Measurement of noise levels will be done by the Occupational Hygienist appointed by the mine for this purpose. Measurement will be done in accordance with the procedures and methodology as laid out within this Code of Practice.

8.2.2 Demarcation of noise zones

- a. Noise zones will be demarcated by the mine in conjunction with the Occupational Hygienist and this will be based upon the noise levels measured within various parts of the company.
- b. Noise zones are generally considered to be any area in which measured noise levels exceed 82 dB.
- c. Demarcated noise zones will be clearly marked with appropriate signage declaring such areas to be noise zones in which hearing protection has to be worn by all employees working within such areas.

8.2.3 Determination of Homogeneous Exposure Groups (HEG's)

HEG's will be classified according to the range of noise levels that employees are exposed to within activity areas. This will be done in accordance with par 6.2 of this Code of Practice.

8.3 **Education, Motivation and Training**

8.3.1 Education and training is an essential component of an effective hearing conservation programme.

8.3.2 The objective of training should be to increase the awareness of noise as a hazard and to motivate employees to take responsibility and play an active role in controlling the risk and the effect it may have on their health.

8.3.3 As a small company, training is less formalised, and will take place in the following manner:

- During induction when employees start working at the company they will be educated on the hazards that are present in the workplace in general and in the specific area they will work;

- Upon issuing of personal protective equipment to employees they will be educated on the proper use and maintenance of such equipment;
- Where non-compliance is observed, counselling and further training and motivation will take place.
- The health and safety representatives will play an important role to create ongoing awareness of employees regarding health and safety and hazards they are exposed to.
- The system of medical surveillance that is in place at the company ensures monthly visits by a nursing sister who counsels employees regarding existing or possible medical problems and their relationship to hazards at work.

8.4 **Noise control Engineering**

- 8.4.1 Noise control engineering is the first level of action to be taken where noise levels exceed acceptable limits.
- 8.4.2 Reduction in noise levels over the last three occupational hygiene surveys have shown engineering controls to be effective in reducing noise levels.
- 8.4.3 Appropriate engineering measures are implemented in conjunction with the occupational hygienist.
- 8.4.4 Effectiveness of noise control engineering will be monitored as part of the annual noise assessments.

8.5 **Personal protection**

- 8.5.1 Issuing of personal protective equipment as a strategy to control the impact of a noise hazard should only be done after other control measures have not been able to reduce noise levels sufficiently.
- 8.5.2 Any hearing protection devices used must comply with SABS standards.
- 8.5.3 Selection of hearing protection devices will be done under guidance of the occupational hygienist and the occupational medical practitioner.
- 8.5.4 The mine will provide hearing protection devices to employees within designated noise zones.
- 8.5.5 Employees will be allowed to indicate a personal preference for a hearing protection device from the range made available by the mine.
- 8.5.6 Employees will be educated by the mine on the proper use, maintenance and storage of the hearing protection devices.
- 8.5.7 Failure or refusal to wear hearing protection devices within noise zones may be subject to disciplinary procedures.
- 8.5.8 Employees and health and safety representatives are to ensure that any problems or concerns regarding hearing protection are reported to management.

8.6 **Monitoring programme**

- 8.6.1 Ongoing, annual noise assessments will be undertaken in areas where noise levels are >82dB or other areas where complaints were received.
- 8.6.2 Risk based medical examinations will be undertaken by the mine in accordance with the occupational medical surveillance program.

9 RECORDKEEPING

- 9.1 The mine will keep records of all noise assessments in the form of the occupational hygienist surveys.
- 9.2 The mine will keep all records of medical surveillance done on individual employees.
- 9.3 The mine will ensure that effective communication takes place between the occupational hygienist and the occupational medical practitioner to ensure that exposure history and any medical manifestations are appropriately identified.

10. IMPLEMENTATION

- 10.1 Implementation of this COP has already taken place and this document simply serves to formalise procedures that are already in place.
- 10.2 Compliance with the COP will be monitored on an ongoing basis by the Health and Safety committee of the mine and the mine management. Responsibilities of various persons are set out below:
 - Managing Director & Production **Supervisor** – Oversee implementation of the COP and any recommendations from the occupational hygienist or occupational medical practitioner
 - Occupational hygienist – performs ongoing assessments, communicates with management and the occupational medical practitioner regarding any actions required
- 10.3 This COP and related documents are available at the mine for examination by any affected person. The trade union or a member of the health and safety committee may request a copy of this COP in writing.