HEALTH, SAFETY & ENVIRONMENTAL MANUAL	4.9 Safe Work Program – Hearing Conservation			
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SAFE WORK PROGRAM

HEARING CONSERVATION

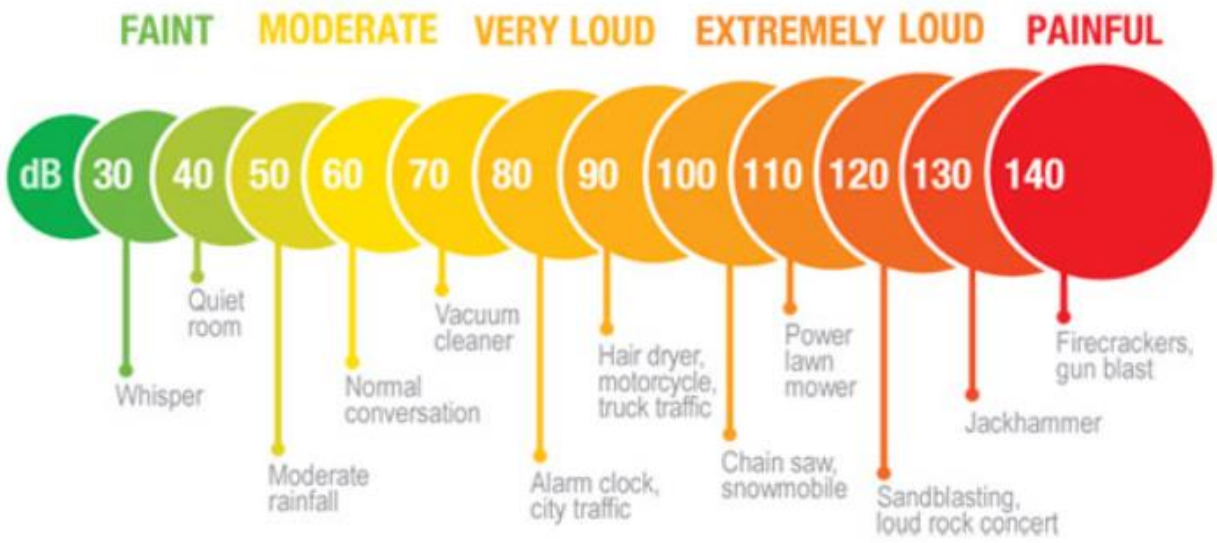
Overexposure to noise can damage your hearing. Hearing loss prevents you from hearing other hazards on the job.

- It interferes with how you hear normal speech
- It can cause high blood pressure
- It is permanent

Noise is measured in decibels (dB). For example, a quick-cut saw produces 115 decibels; an excavator can produce up to 106 decibels for those outside the cab.
Noise power doubles every time noise increases 3 decibels. When the noise level is 80 decibels and it goes up to 83, the noise is twice as loud.

Ontario Reg 381/15 lays out the duties of employers to protect their workers from noise-related hazards. The regulation explicitly states that employers must keep a worker's noise exposure level under a time weighted average (TWA) of 85 dB. Without hearing protection, your safe working limit for an 8-hour day with no other noise exposure is 85 decibels. This is the loudness of a room full of people.

Depending on the noise level and duration, hearing loss may result if proper protection is not used. Typically, approved foam ear plugs and/or earmuffs will be used.



The chart above provides some specific examples workers can use as reference when trying to determine if they require protection.

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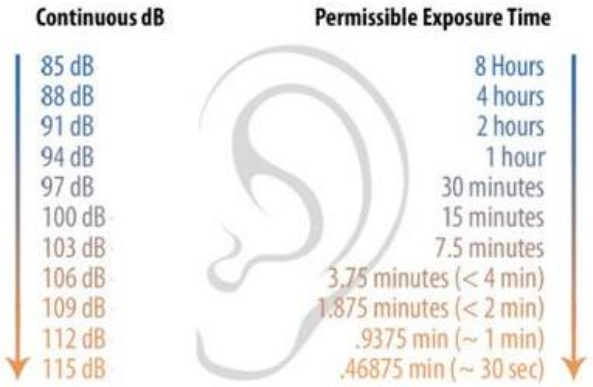
There is also the 'arm's length rule of thumb' which can be considered. If you need to raise your voice to be heard from about three feet away, you are most likely being exposed to noise over 85 dB's.

Supervisors are expected to ensure that PPE for hearing protection is readily available on the job for workers to use as required.



Workplace Hygiene Studies

In October **2012** and July **2013**, an independent hygiene consultant was hired to test employee noise and dust exposure in a **surface mining operation.** Employees were tested in the following lines of employment:

1. Wheel loader operator (CAT 980H)
2. Crusher grounds crew labourer (865)

In January **2018** the same consultant was hired to test employee noise exposure again at a **surface mine**. Employees were tested in the following operations:

1. Wheel loader operator (CAT 980C)
2. Wheel loader operator (John Deere 844K)
3. Crusher operator (ElRus Cone)

The **2012 / 2013** study determined that both workers required a form of hearing protection:

1. Wheel loader operator (CAT 980H) - **foam ear plugs required**
2. Crusher grounds crew labourer (865) – **both foam ear plugs and ear muffs required**

The **2018** study determined that 2 of the 3 workers required hearing protection:

1. Wheel loader operator (CAT 980C) – **foam ear plugs required**
2. Wheel loader operator (John Deere 844K) – **no hearing protection required**
3. Crusher operator (ElRus Cone) – **ear muffs required**

SAFE WORK PROGRAM

In **2014** the company commissioned a noise and air quality study at an **excavation project**. A worker in a trench, a worker above the trench (topman), and an equipment operator were sampled.

Noise dosimetry samples collected during the survey at the workers assessed had average sound level readings ranging from 82.3 A-weighted decibels (dBA) to 92.5 dBA.

Two of the workers assessed were found to have 11-hour time-weighted average exposures (TWAEs) exceeding the Ministry of Labour's (MOL's) time-weighted average (TWA) limit of 85 dBA (allowed for an 8 hour period) with the trench worker having a TWA of 85.4 dBA and the machine operator a TWA of 94.0 dBA. The top worker had an acceptable noise exposure of 83.8 dBA.

However, these noise exposures can vary from day to day depending on the workers' activities which can also vary throughout the construction processes.

SAMPLE DURATION (minutes)	*L-EQ. OVER SAMPLE DURATION §(dBA)	†TWA OVER SHIFT (dBA)	DOSE OVER SHIFT (%)
419	82.3	83.8	75
423	84.0	85.4	110
421	92.5	94.0	791

Machine Operation

Generally speaking, depending on the make and model of machine, employees may need to wear appropriate hearing protection when operating machinery. Since not all environments have been measured for noise exposure, it is advised that all employees wear as a minimum foam ear plugs when operating machinery, unless that type of machine has been specifically excluded.

Please note however, that even though a particular model may have been excluded in one study, your specific operating environment may change (i.e. open windows) which may require hearing protection.

SAFE WORK PROGRAM

Crushing / Processing

All employees must wear the appropriate hearing protection when working in close proximity to crushing and screening equipment. The minimum protection would be earmuffs. Each type of equipment has different noise levels, so dual protection (ear plugs + earmuffs) may be required.

Selection

Some factors to keep in mind while selecting PPE for noise above 85 dB:

- Recommend a factor of 3 dB added to unprotected noise exposure level.
- Recommend the NRR of a hearing device be de-rated to account for "real world" conditions:
  - earmuffs be reduced by 30%,
  - foam or molded earplugs by 50%

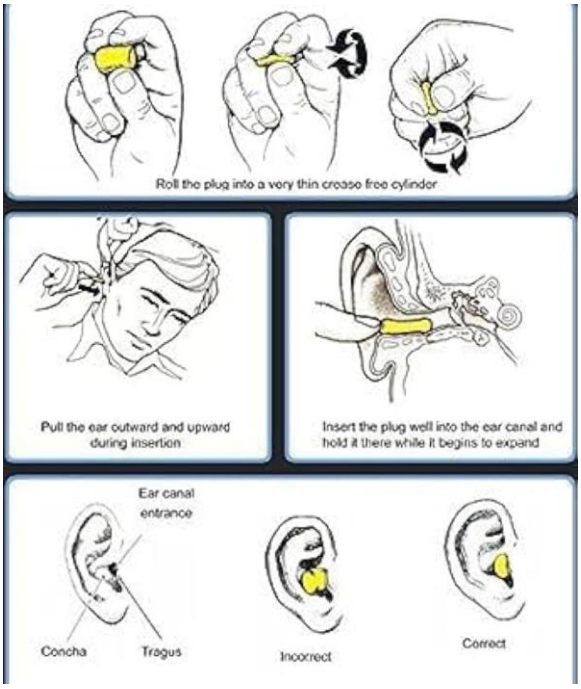
Ear Plugs

Typically, the 3M Classic Foam Earplugs with a Noise Reduction Rating (NRR) of 29 dB are used. All ear plugs supplied for similar work need to maintain this NRR or higher.

Ear Muffs

Typically, the 3M Optime 105 Peltor, cap mount model with a NRR of 27 dB are used. All earmuffs supplied for similar work need to maintain this NRR or higher.

The illustration below illustrates the correct way to insert foam ear plugs:



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Follow all manufacturer's directions for all PPE selected.

Training on J-AAR's hearing conservation program takes place at new employee orientations and through toolbox talks.