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To: DSDs, Staff and Branch Chiefs

From: Associate Deputy State Director for Management Services

Subject: OSO Hearing Conservation Program Update & Annual Compliance Requirements

The **Oregon State Office Hearing Conservation Program**, revised for FY 2003, establishes requirements and procedures that will eliminate, or significantly minimize, the risk to employees of suffering hearing impairment from exposure to excessive levels of noise in the working environment.

This program applies to the work activities of all Oregon State Office employees and volunteers, whether in the office or the field, where excessive noise exposure may result. Supervisors and/or project leaders are responsible to identify those employees who may be exposed to excessive noise levels during the work day. Each employee identified should receive a hearing evaluation in accordance with the monitoring and testing requirements specified in section 16.4.5 & 6 of the plan. Audiometric testing is available through the Public Health Service (PHS).

Any employee identified as being exposed to any excessive noise in the course of their workday is scheduled for a baseline audiogram, if not previously accomplished, and, annual retesting. Please note that an exit audiogram test is required upon termination of employment.
Employee testing is scheduled prior to October 1st each year. Requests to schedule are coordinated through the Safety Office.

Individual supervisors are directly responsible for the safety and health of their employees and play an important role in ensuring that each employee receives appropriate safety training. To assist supervisors in providing information to employees regarding the causes and prevention of hearing loss, a PowerPoint presentation is available on the BLM Intranet Safety Web Page at the following website address: http://web.or.blm.gov/safety/training/training.htm. This site also contains training notes, a short informal quiz, and a certificate of training completion.

For questions and scheduling, please contact Peggy Tribble, OSO Safety and Health Program Manager at 503-808-6202.

Districts with Unions are reminded to notify their unions of this IB and satisfy any bargaining obligations before implementation. Your servicing Human Resources Office or Labor Relations Specialist can provide you assistance in

this matter.

Signed by
John K. Keith
Associate Deputy State Director
For Management Services

Authenticated by
Mary O'Leary
Management Assistant

1 Attachment(s)
1- Hearing Conservation Program (19pp)

Distribution
WO-740
OR-950 (Tribble)

United States Department of the Interior
BUREAU OF LAND MANAGEMENT
OREGON STATE OFFICE

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HEARING CONSERVATION PROGRAM

OR/WA Supplement to BLM Manual Handbook 1112-1
Safety and Health Management

March 2003
Oregon State Office

Occupational Noise Exposure
Hearing Conservation Program

16.4.1 Policy Statement

It is the policy of the Oregon State Office to provide a safe and healthful workplace for all employees, visitors, and contractors. The Hearing Conservation Program establishes requirements and procedures that will eliminate or minimize the risk of hearing loss on the job.

16.4.2 Purpose and Information

Noise, or unwanted sound, is one of the most pervasive occupational health problems. It is a by-product of many industrial processes. Exposure to high levels of noise causes hearing loss and may cause other harmful health effects as well. The extent of damage depends primarily on the intensity of the noise and the duration of the exposure.

Noise-induced hearing loss is the term for hearing damaged by excessive noise. It can be temporary or permanent. Temporary hearing loss results from short-term exposures to noise, with normal hearing returning after a period of rest. Generally, prolonged exposure to high noise levels over a period gradually causes permanent damage. Noise-induced hearing loss is one of the most common occupational diseases and the second most self-reported occupational illness or injury in this country.

Noise-induced hearing loss is 100 percent preventable. However, once acquired, hearing loss is permanent and irreversible. Therefore, employees must take preventative measures to protect their hearing. Removing hazardous noise from the workplace through engineering controls (e.g.; installing a muffler or building an acoustic barrier or enclosure) is the most effective way to prevent noise-induced hearing loss. Following evaluation of engineering controls for effectiveness or feasibility, administrative controls may also be considered. Such controls include reducing employee exposure time to hazardous noise environments by assigned other tasks in a variety of environments. Use Personal protective equipment (hearing protectors) such as earplugs and earmuffs when it is not feasible to reduce noise to a safe level with engineering or administrative controls.

The Hearing Conservation program protects all Oregon State Office employees (whether assigned to the field or the office and whose jobs may exposure them to occupational noises), from suffering material hearing impairment even if they are subject to such noise exposures over their entire working lifetimes. This program complies with the OSHA Hearing Conservation Program Standard, 29CFR 1910.95.

16.4.3 Scope

Conservation of hearing is an important preventative measure. To reduce occupational hearing loss, provide all OSO employees exposed to noise exceeding an 8-hour average exposure of 85 decibels hearing protection, training, information and annual hearing tests.

16.4.4 Responsibilities

Managers and supervisors will determine expected noise exposure for each of their employees and implement requirements as specified in this program. Specifically, responsibilities include:

- Provision of adequate hearing protection for employees should engineering controls fail to eliminate hazardous noise
- Use of engineering and administrative controls to limit employee exposure to excessive noise
- Ensuring that signs and warnings are posted for all high noise areas
- Conducting noise surveys annually or when new equipment is added to the workplace
- Arranging for annual hearing tests for affected employees
- Ensuring that hearing conservation training is provided to all new employees and refresher training is conducted as needed

The State Office Safety Manager is available to provide technical support to supervisors and project leaders in implementation of this program.

Employees will comply with the requirements of this program by consistently using the hearing protection provided when in designated high noise areas. Employees will exercise proper care of hearing protection devices issued for use and will request new hearing protection when needed.

16.4.5 Monitoring

Sound is measured in two ways: decibels and frequency. Decibels indicate the pressure of sound. Sound waves transfer that pressure from place to place. Sound waves are measured in units on a logarithmic scale. Frequency is related to the pitch of sound and is measured in units called *hertz* (Hz), or cycles per second. The pitch of a sound – how high or low it seems – is how we perceive the frequency.

The instruments typically used to measure sound in the workplace are the sound-level meter and the dosimeter. The sound-level meter measures the pressure of sound in a specific area at a moment in time. The dosimeter measures the accumulated noise exposure for one worker. It stores sound-level measurements and combines them over time, providing an average noise-exposure reading for a specific period, such as an eight-hour workday.

The Hearing Conservation Program requires monitoring of noise exposure levels in a manner that will accurately identify any employee exposed to noise at or above 85 decibels (dB) averaged over eight working hours. The exposure measurement must include all continuous, intermittent, and impulsive noises within an 80 dB to 130 dB range and taken during a typical work situation. The Safety Manager is available to assist supervisors in determining noise exposure levels. Work activities that typically expose employees to excessive noise include the following:

- The use of power saws, portable pumps, weed whips, lawn mowers and other two-cycle engines
- Running heavy construction or road maintenance equipment
- Riding in a helicopter, serving as a heliport manager, and other related ground duties
- Shooting rifles, shotguns, or handguns
- Driving a fire engine and operating engine equipment

Other job activities may expose employees to excessive noise. Supervisors should carefully review and determine noise exposure hazards for all employees.

16.4.6 Audiometric Testing and Evaluation (Audiograms)

Audiometric testing not only monitors the sharpness and acuity of an employee's hearing over time, but also provides an opportunity for supervisors to educate employees about their hearing and the need to protect it. The important elements of a testing program include baseline audiograms (within 6 months of employee's first exposure to excessive noise) and annual retesting.

Audiometric testing determines whether an employee's hearing is stable or getting worse over time. The testing instrument is an audiometer and the result of the test – the audiogram – is a graph showing the hearing ability of an employee at different sound-frequency levels. An employee's baseline audiogram establishes a reference for comparison to future audiograms. The following dot points provide basis information regarding audiometric testing requirement.

- Employees exposed to noises that exceed 85 decibels averaged over an eight-hour day must have baseline audiometric tests
- At least annually, after the baseline test, employees must be re-tested if they are exposed above the 85 decibel limit
- The results of each employee's annual audiogram are compared to the baseline audiogram to determine if the employee's hearing has changed
- If the comparison indicates a change in hearing, notify the employee within 21 days of the finding.
- Only a certified audiometric technician, audiologist, otolaryngologist, or physician can perform an audiometric test.

16.4.7 Recordkeeping

Keep noise exposure records for 2 years. Keep records of audiometric test results for the duration of employment of the affected employee.

16.4.8 Personal Protective Equipment – Identification and Use of Hearing Protectors

Hearing protectors must adequately reduce the severity of the noise level for the work environment of each employee. The focus is on three C's: *comfort, convenience, and compatibility*. Do not expect employees to wear hearing protectors that are uncomfortable, difficult to use, or that interfere with their work. Employees should decide, with the help of a person trained in fitting hearing protectors, which types and sizes are appropriate.

Most hearing protectors are labeled with a noise reduction rating (NRR) indicating a protection level in decibels. However, these ratings are not reliable outside of a laboratory – which is where they received the rating. Therefore, employees should not use them solely in making a selection decision. More important are factors that favor comfort, convenience, and compatibility:

- Easy to place and remove
- Simple to care for
- Constructed with non-allergenic materials
- Will not interfere with eyeglasses or hard hats

If workplace noise levels increase, provide employees with protectors that are more effective. The protector must reduce employee exposures to at least 90 dB and to 85 dB when a standard threshold shift has occurred in hearing. OSHA regulations require that locations with noise exposures of 85 – 89 dB (A) will provide hearing protectors for the employee's optional use. Noise exposures at 90 dB or above require the mandatory use of hearing protection. Additionally, OSHA requires that a variety of hearing protectors be available for employees.

There are two types of hearing protectors - earmuffs and earplugs. Both types decrease the pressure of sound that reaches the eardrum and are the next line of defense against noise when employee exposures cannot be reduced to safe levels with engineering or administrative controls. The manufacturer rates each type for noise reduction rating (NRR) as evaluated by ANSI Standards. The actual effectiveness of a hearing protection device can be estimated by subtracting "7" from the NRR and dividing the resulting number by 2. For example, if a work area has an ambient noise exposure of 96 dB (A), the hearing protectors should have an NRR of 20 or better to be effective. (Reference *Appendix B* for a list of various types of hearing protectors) Use double hearing protection (muffs and plugs) when noise levels exceed the NRR of a single hearing protector. Not every type of hearing protection is useful for every type of noise. Disposable foam

earplugs may be fine for some noise exposure while earmuff-type protection may be suitable for another.

When noise is too loud, it can damage the sensitive hair cells in your inner ear. Those hair cells are the "foot soldiers" for your hearing. As the number of damaged hair cells increases, your brain receives fewer impulses to interpret as sound. When you damage hair cells, you damage hearing.

While a single exposure to loud noise – such as a shotgun blast – can damage hair cells, it probably will not destroy them. A person may experience ringing in the ears and some sounds may be muffled, but hair cells will recover and so will hearing. This is a temporary threshold shift. Alternatively, repeated exposures to loud noise – hundreds of shotgun blasts – will damage hair cells to the point that they cannot recover. Because the damage is permanent, the result is a permanent threshold shift. There is no treatment – no medicine, no surgery, not even a hearing aid – that will restore hearing. When an individual destroys hair cells, hearing ability is destroyed.

To check if the environment you work in could cause a hearing loss, ask yourself the following two questions. If you answer yes to either of these questions, get your hearing tested and protect your ears.

- ☑ Is the noise at my workplace so loud that I have to raise my voice significantly for someone at arm's length away to hear me?

- ☑ When I leave work and am in a quieter environment, do my ears feel plugged? Alternatively, do I hear a mild ringing or whooshing noise that goes away after an hour or two?

16.4.9 Training

Supervisors must ensure that all employees who are included in the OSO Hearing Conservation Program receive initial training and annual refresher training. This training discusses the purpose, advantages, and disadvantages of various types of hearing protectors; the selection, fit, and care of protectors; and the purpose and procedures of audiometric testing.

To assist managers and supervisor in their training efforts, A Power-Point presentation is available on the BLM Intranet Safety Web Page at the following site:

http://web.or.blm.gov/safety/training/training.htm.

This site also contains training notes, a short informal quiz (also part of the Power Point program), and a certificate of training completion.

Definitions

Audiogram - A chart, graph, or table resulting from an audiometric test documenting hearing threshold levels as a function of frequency.

Administrative Controls – A method of controlling workplace hazards by managing workers' activities to reduce exposure.

Attenuation – The amount of noise reduction afforded an employee by use of a hearing protector.

Baseline Audiogram – The first audiogram provided to an employee.

Conductive Hearing Loss – Loss caused by damage to or a malfunction of the outer and middle ear. It results in a decrease in hearing. Several medical disorders cause this type of hearing loss such as middle ear infections, perforation of the eardrum, fixation of the ossicular chain, and otoselerosis.

Decibel (dB) – A unit of measurement of sound level (indicates the pressure of sound)

Engineering Control – A method of controlling a workplace hazard by modifying or eliminating the source of exposure so that it is no longer hazardous

Excessive Noise Level – Identified as any noise level 85 dB (A) and above

Frequency – Frequency is related to a sound's pitch and is measured in units called hertz (Hz), or cycles per second

Noise dosimeter – This instrument measures the accumulated noise exposure for one worker. It stores sound-level measurements and combines them over time, providing an average noise-exposure reading for a specific period such as an eight-hour workday.

NIOSH – National Institute for Occupational Safety and Health

Otolaryngologist – A physician specializing in diagnosis and treatment of disorders of the ear, nose and throat

Sensory Hearing Loss – Loss caused by damage to, or a malfunction of, the inner ear, auditory nerve, or the brain. This type of loss makes it more difficult to understand speech, but does not result in a decrease in loudness. Causes of this type of hearing loss are hereditary, aging, noise, disease, injury and some types of drugs. This type of hearing loss is permanent and cannot be corrected medically or surgically.

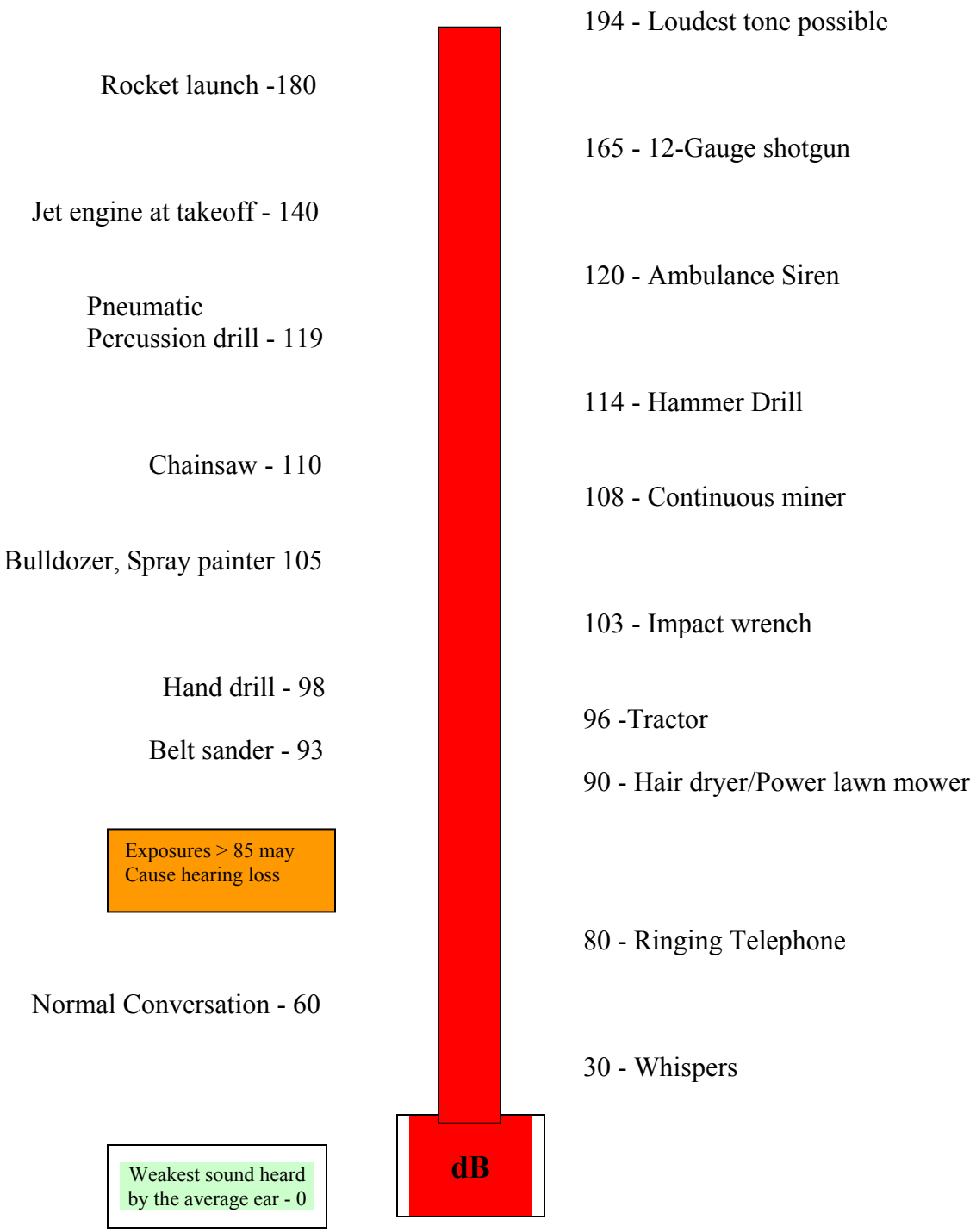
Sound Level Meter – An instrument for the measurement of sound level. This instrument measures the pressure of sound in a specific area at a moment in time.

Standard Threshold Shift – (STS) A change in hearing threshold relative to the baseline audiogram of an average of 10 dB (A) or more at 2000, 3000, and 4000 Hz in either ear.

Tinnitus – a ringing or roaring sound, sometimes described as the sound of crickets in one or both ears. Tinnitus can accompany both immediate and gradual hearing loss.

Appendix A

General Estimates of Work-Related Noises



Appendix B

Types of Hearing Protection

There are several main types of hearing protectors. Each type requires a slightly different fitting technique. NIOSH recommends that hearing protectors be personally fit to each employee.
The best hearing protector is the one that is comfortable and convenient and that employees will wear EVERY time they are in an environment with hazardous noise.

Expandable foam plugs
These plugs are made of a formable material designed to expand and conform to the shape of each person's ear canal. Roll the expandable plugs into a thin, crease-free cylinder. Whether you roll plugs with thumb and fingers or across your palm does not matter. What is critical is the result – a smooth tube thick enough so that about half the length will fit easily into your ear canal. Some individuals, especially women with small ear canals have difficulty rolling typical plugs small enough to fit. A few manufacturers now offer a small size expandable plug.

Pre-molded, reusable plugs
Pre-molded plugs are made from silicone, plastic or rubber and are manufactured as"one-size-fits-most" or are available in several sizes. Many pre-molded plugs are available in sizes for small, medium or large ear canals.

Individuals may need a different size plug for each ear. The plugs should seal the ear canal without being uncomfortable. Insert this type of plug by reaching over your head with one hand to pull up on your ear. Then use your other hand to insert the plug with a gentle rocking motion until you have sealed the ear canal.

Advantages of pre-molded plugs are that they are relatively inexpensive, reusable, washable, and convenient to carry, and come in a variety of sizes. Nearly everyone can find a plug that will be comfortable and effective. In dirty or dusty environments, you do not need to handle or roll the tips.

Canal caps
Canal caps often resemble earplugs on a flexible plastic or metal band. The earplug tips of a canal cap may be a formable or pre-molded material. Some have headbands that can be worn over the head, behind the neck or under the chin. Newer models have jointed bands increasing the ability to properly seal the earplug.

The main advantage canal caps offer is convenience. When it is quiet, employees can leave the band hanging around their necks. They can quickly insert the plug tips when hazardous noise starts gain. Some people find the pressure from the bands uncomfortable. Not all canal caps have tips that adequately block all types of noise. Generally, the canal caps tips that resemble stand-alone earplugs seem to block the most noise.

Earmuffs

Earmuffs come in many models designed to fit most people. They work to block out noise by completely covering the outer ear. Muffs can be "low profile" with small ear cups or large to hold extra materials for use in extreme noise. Some muffs also include electronic components to help users communicate or to block impulsive noises.

Workers who have heavy beards or sideburns or who wear glasses may find it difficult to get good protection from earmuffs. The hair and the temples of the glasses break the seal that the earmuff cushions make around the ear. For these workers, earplugs are best. Other potential drawbacks of earmuffs are that some people feel they can be hot and heavy in some environments.

Miscellaneous devices

Manufacturers are receptive to comments from hearing protection users. This has led to the development of new devices that are hybrids of the traditional types of hearing protectors. Because many people like the comfort of foam plugs, but do not want to roll them in dirty environments, a plug is now available that is essentially a foam tip on a stem. You insert this plug much like a pre-molded plug without rolling the foam. Scientists are developing earmuffs using high-tech materials to reduce weight and bulk, but still effectively block noise. On the horizon may be earplugs with built in two-way communication capability.

Appendix C

Concerns and Frequently Asked Questions (FAQ's) About Hearing and Hearing Protection

? **Do we lose our hearing as we age?**
It is true that most people's hearing gets worse as they get older. However, for the average person, aging does not cause impaired hearing before at least the age of 60. People who are not exposed to noise and are otherwise healthy keep their hearing for many years. People who are exposed to noise and do not protect their hearing begin to lose their hearing at an early age. For example, by age 25 the average carpenter has "60-year-old" ears!

? **Can you poke out your eardrums with earplugs?**
That is unlikely for two reasons. First, the average ear canal is about 1-¼ inches long. The typical earplug is from ½ to ¾ of an inch long. Therefore, even if you inserted the entire earplug, it would still not touch the eardrum. Second, the path from the opening of the ear canal to the eardrum is not straight. In fact, it is quite irregular. This prevents you from poking objects into the eardrum.

? **I work in a dusty, dirty place. Should I worry that my ears will be infected by using earplugs?**
Using earplugs will not cause an infection. Have clean hands to roll or form earplugs. There are plenty of earplugs that are pre-molded or that have stems so they can be inserted without having to touch the part that goes into the ear canal.

? **Can you hear warning sounds, such as backup beeps, when wearing hearing protectors?**
There are fatal injuries because people do not hear warning sounds. However, this is usually because the background noise was too high or because the person had a severe hearing loss. Using hearing protectors will bring both the noise and the warning sound down equally. If the warning sound is audible without the hearing protector, it will be audible when wearing the hearing protector.

? **Since I already have hearing loss and wear a hearing aid, hearing prevention programs do not apply to me, right?**
If you have hearing loss, it is important to protect the hearing that you have left. Loud noises can continue to damage your hearing making it even more difficult to communicate at work and with your family and friends.

? **Why should I wear hearing protection? They are all uncomfortable**.
Hearing protection may be uncomfortable at first, but hearing loss due to noise exposure is permanently uncomfortable. You have to adjust to wearing hearing protection just as you might have to get used to wearing a new pair of shoes. If you have the opportunity, check out different kinds of hearing protection to see which kind gives you the least discomfort. Maybe it is only a matter of resizing or refitting your hearing protection.

? **Why should I wear hearing protection? I am getting used to the noise.**
You do not get used to noise. You just lose more and more of your hearing. It seems like you are getting used to the noise because you are hearing less and less of it. Having to listen to noise does not make your ears any tougher. However, you can save the hearing you have left by wearing protection.

? **If I wear hearing protection, will I be able to hear changes in machinery that might signal trouble?**
Yes, as you will get used to the way your equipment normally sounds when you are wearing hearing protection, so you will notice the difference.

? **Should I wear earmuffs or earplugs?**
Earmuffs do not work any better than earplugs. When comparing plugs and muffs of the same quality, plugs generally are superior. However, every situation and every use is different.

? **Can earplugs give me ear canal infections or damage my ears?**
No infection will occur if you keep your hearing protection clean. Never push them so far into your ear that you feel discomfort. Signs of ear canal infection include redness inside ear, pain, itching, fever, ringing or other noises in ear, and discharge or draining from the ear.

? **Once I put in my hearing protection, can I just forget about it until I take it off for my break?**
No. Hearing protection can work loose and needs to be readjusted on occasion.

? **Why should I worry about losing my hearing? I can just get a hearing aid.**
Wrong hearing aids cannot correct hearing problems caused by noise. Noise damage is due to destruction of nerve cells in the inner ear – there are not enough hair cells to receive amplified sounds produced by a hearing aid.

Table I – Allowable Employee Noise Exposure

(Without Hearing Protection)

Sounds Level in Decibels (dBA)	Allowable Exposure Hours Per Day At the Action Level (85 dBA)
85	8 (city traffic)
90	4 (gas-powered lawn mower)
92	3
95	2 (Tractor-trailer rig)
97	1.5
100	1 (snow mobile)
102	.75
105	30 minutes (electric power saw)
110	15 minutes (Chain saw)
115	7.5 minutes

Table II – Allowable Employee Noise Exposure without Hearing Protection for Impulse or Impact Noise *(such as the firing of rifles, shotguns, or handguns)*

Impulse or impact noise exposures above 140 decibels are not allowed without hearing protection. Rifles typically have impulse sound levels at or above 148 decibels; thus hearing protection should always be worn when shooting and the noise level should be reduced to the level shown on the chart below by wearing hearing protection with enough NRR (noise reduction rating) to bring the sound level down to at least 140 decibels.

Sound Level decibels	Permitted Number of Impulse Or Impacts per Day
140	100
130	1,000
120	10,000

Table III – Personal Hearing Protection Analysis Chart

OSHA experience and the published scientific literature indicate that laboratory-based ear attenuation data for hearing protection is seldom achieved in the workplace. It is recommended that the 50% safety factor shown in Column 4 below be used when choosing personal hearing protection.

8-Hour TWA Decibel Level	NRR	Assumed Protection 8-Hour TWA Decibel Level*	Better Hearing Protection 8-Hour TWA Decibel Level with 50% Safety Factor#	Better Hearing Protection Required by OSHA Standard (Yes or No)	Better Hearing Protection Required by OSHA Standard for STS Employees (Yes or No)	Better Hearing Protection Recommended
90	20	77	83.5	NO	NO	NO
90	30	67	78.5	NO	NO	NO
95	82	82	88.5	NO	NO	YES
95	30	72	83.5	NO	NO	NO
100	20	87	93.5	NO	YES (1)	YES
100	30	77	88.5	NO	NO	YES
105	20	92	98.5	YES (1)	YES (1)	YES
105	30	82	93.5	NO	NO	YES
110	20	97	103.5	YES (1)	YES (1)(2)	YES
110	30	87	98.5	NO	YES (2)	YES
115	20	102	108.5	YES (1)(2)	YES (3)	YES
115	30	92	103.5	YES(2)	YES (3)	YES
120	20	107	113.5	YES (3)	YES (3)	YES
120	30	97	108.5	YES (3)	YES (3)	YES
125	20	112	118.5	YES (3)	YES (3)	YES
125	30	102	113.5	YES (3)	YES (3)	YES

Better hearing protection can be achieved in three ways:
1- Use hearing protection with a higher NRR (Noise Reduction Rating)
2 - Add an earplug to a muff or muff to a plug; i.e., have dual protection.
3 - Choose one of the above recommendations and reduce exposure hours *(See Table 1)*
If both an earplug and a muff are worn together, the noise reduction is calculated by adding 5 decibels to the level of the higher-rated protector.
*Formula: TWA – (NRR-7)
Formula: TWA (NRR-7 x .50)

Table IV – Noise Reduction Summary for Common Ear Plugs

Ear Plug Type of Brand	NRR	Mean Attenuation Data for Some Common Ear Plugs At the Center Frequencies Shown Below								
Foam Disposable		**125 Hz**	**250 Hz**	**500 Hz**	**1,000 Hz**	**2,000 Hz**	**3,150 Hz**	**4,000 Hz**	**6,300 Hz**	**8,000 Hz**
Max	33	33.1	36.3	36.8	38.4	38.7	44.1	45.9	45.4	46.0
Pura-fit	31	32.8	34.7	37.9	38.1	38.6	42.8	44.6	44.7	43.9
Ear	29	37.4	40.9	44.8	43.8	36.4	41.9	42.6	46.1	47.3
Weston Custom Molded										
#40 Soft P.V.C.	25	28.7	29.1	30.9	34.8	36.9	42.9	41.5	39.5	39.2
40	25	28.7	29.1	30.9	34.8	36.9	42.9	41.5	39.5	39.2
42	10	11.5	11.9	12.9	15.2	25.9	29.6	29.0	22.3	18.2

Note: The mean attenuation data above is provided for comparison purposes only. When selecting hearing protection according to OSHA criterion, use the NRR number, not the above attenuation data.

To correct laboratory derived data for field conditions, subtract "7" decibels from the NRR, then subtract the resulting number from the assumed noise level.
For example; NRR – 25; noise level of a specific power saw is assumed to have a noise level of 110 decibels; 25 NRR minus 7 = 18; 110 minus 18 = 92 decibels or the assumed noise level at the ear.

Table V – Decibel Levels
Some Common Types of Equipment Used by BLM Employees

Equipment Type	Typical Decibel Level	Comments
Stihl 020 Chain Saw	101	Manufacturer Rating Decibels (MRD)
Stihl 024 Chain Saw	105	Manufacturer Rating Decibels (MRD)
Stihl 028 Chain Saw	102	Manufacturer Rating Decibels (MRD)
Stihl 034 Chain Saw	107	Manufacturer Rating Decibels (MRD)
Stihl 038 Chain Saw	106	Manufacturer Rating Decibels (MRD)
Husqvarna 2101 xp	106	Manufacturer Rating Decibels (MRD)
Caterpillar D6 Dozer	85-89 closed doors/windows in cab 78-112 static exterior sound at 45-50 feet from equipment	Manufacturer Rating Decibels (MRD)
Caterpillar 130G Grader	84-85 closed doors/windows in cab 85 static exterior sound 45-50 feet from equipment	Manufacturer Rating Decibels (MRD)
John Deere 544E Loader	80 doors closed 84 doors open	Manufacturer Rating Decibels (MRD)
John Deere 2750 Tractor	80 closed doors/windows in cab 85 at 45-50 feet from equipment	Manufacturer Rating Decibels (MRD)
Case 580K Tractor	81-83.5 closed doors/windows in cab 78.6 at 45-50 feet from equipment	Manufacturer Rating Decibels (MRD)
International Harvester F2574 Dump Truck (350 turbo engine)	87 full throttle/idling	Manufacturer Rating Decibels (MRD)
Twin turbine engine Helicopters (MBB BO 105 & MBB BK 117) These 2 types of helicopters represent the highest expected noise levels expected	85 at idle – 97 at left off (immediate vicinity) 75 at 200 feet from helicopter	Special noise level study was accomplished in Portland

Illustration 16.4-1
Basic Information Regarding Hearing and Hearing Protection
(Individual slides from Power Point Program)

How We Hear Sounds

- Sound waves enter the ear canal
- Eardrum vibrations pass along tiny bones
- Tiny hairlike cells flow back and forth
- The auditory nerve sends signals that are registered as sound to the brain

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How Hearing Is Damaged

- Hearing ability consists of delicate parts
- Hairlike cells are flattened
- You become accused to noise; you gradually lose your hearing
- Once hearing is damaged, it cannot be repaired or replaced

5

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Signs of Hearing Loss

- Difficulty hearing people speak
- Inability to he certain high- ched or soft soun
- Noise or rir ng in ears
- Getting co nts that the dio or T olume is too

6

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Hearing Protection Devices (HPDs)

- Ear plugs
- Canal caps
- Earmuffs

15

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Management Responsibility

- Provide hearing protection devices
- Demonstrate commitment—wear HPDs
- Provide hearing protection training
- Enforce the use of HPDs
- Knowledgeable in HPD selection and use
- Encourage questions and solve problems

18

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Training

- Required annually
- Topics must incl e:
  - How noise impacts hearir
  - Hearing prot devices
  - Hearing tes

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