DRAFT RECLAMATION SAFETY AND HEALTH STANDARDS
RELEASE
Comments on this draft release must be submitted to ssummerhays@usbr.gov by December 15, 2019.

Background and Purpose of the Following Draft Reclamation Safety and Health Standards (RSHS)

The RSHS are being updated by the Bureau of Reclamation Safety and Occupational Health Office to reflect new guidance from Reclamation, the Department of the Interior, and the Occupational Safety and Health Administration. This public release is intended to provide the public an opportunity to comment on each updated section in draft form. This process will enhance transparency and eliminate potential confusion about Reclamation’s safety standards.


See the following pages for the draft RSHS.
Section 31

Hearing Loss Prevention Program

31.1 Scope

This section establishes minimum requirements for a Reclamation Hearing Loss Prevention Program (HLPP) to ensure safety and occupational health hazards related to hearing are appropriately addressed. The HLPP applies to all employees working at or visiting facilities who are exposed to noise at or above 85 decibels, A scale (dBA), for an eight-hour time-weighted average (TWA) using a 3 dBA exchange rate. All affected employees are required to participate in the HLPP.

31.2 General Requirements

31.2.1 3 dB and 5 dB Exchange Rate Comparison

Reclamation shall use the stricter National Institute of Safety and Health (NIOSH) exchange rate of 3 dB to be proactive in reducing noise-induced hearing loss (NIHL) for our employees. This exchange rate allows lower sound level exposures for shorter amounts of time compared to the Occupational Safety and Health Administration (OSHA) 5 dB exchange rate, as shown in Table 31-1.

<table>
<thead>
<tr>
<th>Time to Reach 100% Noise Dose</th>
<th>NIOSH 3 dB Exchange Rate Exposure Level</th>
<th>OSHA 5 dB Exchange Rate Exposure Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 hours</td>
<td>85</td>
<td>90</td>
</tr>
<tr>
<td>4 hours</td>
<td>88</td>
<td>95</td>
</tr>
<tr>
<td>2 hours</td>
<td>91</td>
<td>100</td>
</tr>
<tr>
<td>1 hour</td>
<td>94</td>
<td>105</td>
</tr>
<tr>
<td>30 min</td>
<td>97</td>
<td>110</td>
</tr>
<tr>
<td>15 min</td>
<td>100</td>
<td>115</td>
</tr>
</tbody>
</table>

31.2.2 Controls

Engineering and administrative controls shall be implemented as the first line of defense when employees are exposed to sound levels greater than an eight-hour TWA of 85 dBA. Hearing protection devices (HPDs) shall be used when engineering and/or administrative controls fail to reduce the sound levels below the eight-hour TWA of 85 dBA.
31.2.3 Exposure Limit
The NIOSH exposure limit of 85 dBA, based on an eight-hour TWA, shall be used to determine if personal dosimetry results have been exceeded.

31.2.4 Noise Measurements
All continuous, intermittent, and impulsive sound levels from 80 dBA up to and including 140 dBA shall be integrated when conducting noise measurements.

31.2.5 Equipment Purchases
Those who are responsible for purchasing tools/equipment shall review the Buy Quiet requirements outlined in paragraph 31.7.2 to help reduce employee noise exposure.

31.3 Responsibilities

31.3.1 Reclamation Safety and Occupational Health Office
31.3.1.1 Shall provide technical support to assist Regional Safety Managers and Program Coordinators with implementing the HLPP.

31.3.2 Area Office Manager
31.3.2.1 Shall ensure all affected employees are trained on and comply with this program
31.3.2.2 Shall provide necessary resources to implement and maintain the procedures in the HLPP.
31.3.2.3 Shall select an Area Office Program Coordinator (PC), if a Regional Program Coordinator (RPC) has not been designated or in addition to, and provide them with the authority to implement the HLPP.

31.3.3 Regional/Area Office Program Coordinators
31.3.3.1 Shall evaluate, review, and approve HPDs used at their facilities and provided for all affected employees.
31.3.3.2 Shall coordinate with the Regional Industrial Hygienist (IH) to conduct noise surveys to determine if noise levels are at or above the action level of 85 dBA for an eight-hour TWA.
31.3.3.3 Shall provide employees with written notification for all personal noise dosimetry taken. This documents the results and indicates if they have been exposed to noise at or more than 85 dBA (action level) for an eight-hour TWA.
31.3.3.4 In coordination with the First-Line Supervisor, shall ensure that annual audiometric testing is conducted for all employees in the HLPP for their responsible area(s).
31.3.3.5 In coordination with the First-Line Supervisor, shall ensure that areas where noise levels are greater than 85 dBA have been marked with either Caution or Danger signs per 31.11.

31.3.3.6 In coordination with the First-Line Supervisor, ensure that employees that have experienced a standard threshold shift (STS) compared to their baseline audiogram are informed of this fact in writing within 21 days of the determination.

31.3.3.7 In coordination with the First-Line Supervisor, ensure that a retest/confirmation audiogram is completed within 30 days of the initial test date for employees who have experienced an STS or recordable hearing loss.

31.3.3.8 Maintain a list of all employees who are required by job title to be in the HLPP.

31.3.3.9 In coordination with the First-Line Supervisor, refer employees with problem audiograms to an audiologist, otolaryngologist, or physician, who shall review the problem audiogram and determine whether there is a need for further evaluation.

31.3.3.10 If any hearing tests reveal that an employee has experienced a work-related STS in one or both ears and that the employee’s total hearing level is 25 dB or more above audiometric zero (averaged at 2000, 3000 and 4000 Hz) in the same ear(s) as the STS, ensure the tests are recorded in the Safety Management Information System (SMIS) as a hearing loss within seven days of receiving the results.

31.3.4 First-Line Supervisors

31.3.4.1 Shall ensure that employees under their supervision receive annual HLPP training and audiometric testing as required by this section.

31.3.4.2 Shall ensure that documentation of training and testing required by the HLPP are retained in the agency system of tracking training.

31.3.4.3 Shall ensure that HPDs are available and worn by affected employees, contractors, or visitors in their areas of responsibility as required by this section.

31.3.4.4 Shall ensure that personnel under their supervision have been trained in the proper use, selection, maintenance, and storage of HPDs.

31.3.4.5 In coordination with the Area Office PC and/or RPC, shall review annual audiogram results with their employees that have shown an STS or OSHA-recordable hearing loss to ensure that they are refitted and retrained in the use of HPDs.

31.3.5 Regional Safety Manager (RSM)

31.3.5.1 Shall appoint an RPC as deemed necessary for their region.
31.3.5.2 Shall promote the development and implementation of an HLPP within their region.

31.3.5.3 In cooperation with the RPC and/or Area Office PC, shall perform periodic spot checks to ensure compliance with this section.

31.3.6 Project Manager/Acquisitions

31.3.6.1 Shall coordinate the purchase of new equipment that meets the Buy Quiet requirements outlined in 31.7.2 to reduce employee noise exposure.

31.3.6.2 Shall include noise levels and technical performance criteria in specifications when purchasing or designing new equipment that is expected to produce levels of 80 dBA or higher.

31.3.7 Human Resources

31.3.7.1 Shall ensure that pre-employment physicals include baseline audiometric evaluations when required by specific physical job requirements.

31.3.7.2 Shall maintain all audiometric test results in an employee’s medical folder and shall provide Regional Industrial Hygienists and the RPC and/or area office PC access to preplacement and annual audiograms to facilitate the IH’s assessment of work-related STS and/or OSHA-recordable results.

31.3.8 Industrial Hygienists

31.3.8.1 Shall provide technical safety and occupational health assistance for their region, such as implementing the HLPP, providing dosimetry to determine employee exposure, coordinating sound level surveys, and conducting periodic reviews for compliance with the HLPP.

31.3.8.2 Shall review employee audiogram results that an audiologist, otolaryngologist, or physician has identified as work-related STS or OSHA-recordable hearing loss to determine if further investigation in coordination with the Area Office Program Coordinator is necessary.

31.3.9 People Doing the Work

31.3.9.1 Shall use, care, maintain, and store HPDs according to manufacturers' instructions.

31.3.9.2 Shall ensure that HPDs are replaced when they show wear and tear from overuse or when they are defective and do not provide the level of protection for which they were designed.

31.3.9.3 Shall report any noise exposure concerns to their First-Line Supervisor and/or Program Coordinator.
31.3.9.4 Shall attend annual HLPP training and audiometric testing.

31.4 Training Requirements

31.4.1 Initial
All employees who are exposed to noise at or above an eight-hour TWA of 85 dBA must participate in the HLPP and receive training. Training shall include but not necessarily be limited to the following subjects:

- The effects of noise on hearing, including a detailed explanation of the impact of hearing loss and the ease of protection and prevention
- The purpose of HPDs; the advantages, disadvantages, and attenuation of various types of HPDs; and instructions on selection, fitting, use, and care of HPDs
- How to evaluate the effectiveness and test the fit of HPDs, including pre-fit, fit, and post-fit evaluation procedures
- The purpose of audiometric testing and an explanation of test procedures
- How to understand audiogram results
- How an STS and OSHA-recordable result are determined

31.4.2 Refresher Training
All employees in the HLPP must attend training annually.

31.4.3 Lack of Proficiency
Employees observed to be incorrectly wearing their HPDs for job tasks that require them shall be retrained by their supervisor on proper fit and must demonstrate how to wear them correctly by the end of their shift.

31.4.4 Recordkeeping
31.4.4.1 Training Records. Maintain training records for at least two years in the agency system for tracking training. The employer must provide these records to the Deputy Commissioner of Labor for Occupational Safety and Health (or their designee) upon request.

31.4.4.2 Noise Measurements. All personal dosimetry records must be kept in the employee’s medical file for the duration of their employment.

31.4.4.3 Medical, Exposure, and Monitoring Records. Maintain employee medical, exposure, monitoring, and training records per OSHA 29 CFR 1910.1020, the Privacy Act of 1974 (P.L. 93-579), and 5 CFR 293. See also “Recordkeeping Requirements” in RSHS Section 7.
31.5 Hazard Identification, Assessment, and Safety Measures

31.5.1 Health Hazard Assessments
Health hazard assessments shall be conducted according to RSHS Section 7, paragraph 7.2, which requires an exposure assessment and monitoring when evaluating new processes, establishing baselines, and evaluating engineering controls for noise exposure.

31.5.2 Noise Control Plan
As required by RSHS Section 7, paragraph 7.4.2, a noise control plan shall be developed and implemented when either stationary or portable sources expose employees to noise levels of 85 dBA or greater.

31.5.3 Job Hazard Analysis (JHA)
A JHA must be completed for each job task that identifies specific sources of noise and the appropriate personal protective equipment (PPE) to wear during the work.

31.5.4 Monitoring Requirements
A monitoring program must be implemented when an employee’s exposure equals or exceeds an eight-hour TWA of 82 dBA (the action level) to identify employees that need to be included in the HLPP and determine the appropriate HPDs.

31.5.4.1 Initial Determination. Determine an employee’s exposure by taking sound level measurements representative of the employee’s job task(s) and work environment or by personal dosimetry.

31.5.4.2 Personal Dosimetry. Representative personal dosimetry shall be conducted for high worker mobility, when a worker experiences significant variations in sound level, or when a significant component of impulse noise makes area monitoring inappropriate.

31.5.4.3 Reassessment. Monitoring shall be repeated whenever a change in operations or equipment increases noise exposure such that additional employees may be exposed at or above the action level and/or HPDs are inadequate to reduce levels to 85 dBA or less for employee protection.

31.5.5 Audiometric Testing Program
Audiometric testing shall be performed by a licensed or certified audiologist, otolaryngologist, or other physician, or by a technician who is responsible to an audiologist, otolaryngologist, or physician.

31.5.5.1 Required Credentials for Technicians. Technicians must either be certified by the Council of Accreditation in Occupational Hearing Conservation or have satisfactorily demonstrated competence in administering audiometric examinations, obtaining valid...
audiograms, and properly using, maintaining, and checking calibration and proper functioning of the audiometers being used. A technician who operates microprocessor audiometers does not need to be certified.

**31.5.5.2 Parameters of Audiometric Tests.** All audiometric tests must be conducted in accordance with American National Standards Institute (ANSI) standard S3.21-2004 and include audiometric test frequencies 500, 1000, 2000, 3000, 4000, 6000, and 8000 Hz for each ear.

**31.5.6 Baseline and Annual Audiometric Testing**

**31.5.6.1 Testing Requirements.** Audiometric testing shall be conducted on all employees whose exposure levels equal or exceed the action level (AL) of 82 dBA for an eight-hour TWA. The conditions of and the equipment used for the testing must comply with the specifications stated in OSHA 29 CFR 1910.95.

**31.5.6.2 Pre-test Quiet Period.** Audiograms must be preceded by at least 14 hours without employee exposure to workplace noise. Employees should also avoid exposure to high levels of non-occupational noise during the 14 hours preceding the test.

**31.5.6.3 Baseline Audiograms**

**31.5.6.3.1 BASELINE TESTING.** An employee shall receive baseline audiometric testing within six months of their first exposure at or above the action level. Subsequent audiograms will be compared to this baseline.

**31.5.6.3.2 QUIET PERIOD REQUIREMENTS.** Quiet period requirements for baseline audiograms may be met by the employee’s wearing hearing protection that reduces their exposure to a noise level of 85 dBA or lower; however, a true quiet period that prevents employee exposure to workplace noise and limits employee exposure to non-occupational noise is preferred.

**31.5.6.3.3 INTERIM PROTECTION.** Employees must be trained on the use of HPDs and required to wear them until they receive their baseline audiogram.

**31.5.6.3.4 MOBILE TEST VANS.** If mobile test vans are used to meet the baseline audiometric testing requirement, then the employer has up to one year from the employee’s first exposure at or above the AL of 82 dBA to get a valid baseline audiogram. During testing, mobile test vans shall be in an area away from activities generating noise to ensure accurate results.
31.5.6.4 Annual Audiograms

31.5.6.4.1 AUDIOTGRAM FREQUENCY. At least annually after the baseline audiogram the employee shall receive a new audiogram to determine by comparison if an STS has occurred.

31.5.6.4.2 QUIET PERIOD REQUIREMENTS. Quiet period requirements for annual audiograms may be met by the employee’s wearing hearing protection that reduces their exposure to a noise level of 85 dBA or lower; however, a true quiet period that prevents employee exposure to workplace noise and limits employee exposure to non-occupational noise is preferred.

31.5.6.4.3 AUDIOTGRAM RESULTS. The audiogram results shall be provided to the employee immediately following the test.

31.5.6.5 STS Determination

31.5.6.5.1 AGE CORRECTION REQUIREMENTS. No allowances for the contribution of aging (presbycusis) will be made when evaluating changes to an employee’s hearing level. This enables Reclamation to be as proactive as possible in identifying STS occurrences. Age correction for determining an OSHA-recordable hearing loss is acceptable following the procedures in OSHA 29 CFR 1910.95.

31.5.6.5.2 AUDIOTGRAM RETESTING. If the annual audiogram results show that an STS has possibly occurred, then the employee may be retested within 30 days of the initial test date. For this confirmation audiogram, earmuffs or earplugs should not be used to achieve the required 14-hour pre-test quiet period.

31.5.6.5.3 STS PROCEDURES. If it is determined that an STS is work-related or aggravated by work-related noise, then implement the following procedures:

- Employees not wearing hearing protection must be fitted with HPDs, trained in their care and use, and required to use them.
- Employees already using HPDs must be refitted and retrained in their care and use. Hearing protection offering greater attenuation may be selected and issued.

31.5.6.5.4 STS NOTIFICATION. An employee shall be notified in writing within 21 days of the determination that an STS has occurred.

31.5.6.5.5 CLINICAL REFERRAL. The employee shall be referred for a clinical audiological evaluation or an otological examination, as appropriate, if additional testing is necessary or if the employer suspects that a medical
pathology of the ear is caused or aggravated by the wearing of hearing protection.

31.5.6.6 Confirmed OSHA-Recordable Audiogram. All annual audiograms that indicate an OSHA-recordable result must be confirmed by a second audiogram within 30 days of the test results. The results of the retest shall be considered the annual audiogram and shall be recorded in SMIS as outlined in 31.3.3.10. For more information, review OSHA 29 CFR 1904.10, Recording Criteria for Cases Involving Occupational Hearing Loss.

31.5.6.7 Non-Persistent Threshold Shift. If subsequent audiograms indicate that a previously determined threshold shift is not persistent, then the employee must be informed of the new audiometric interpretation.

31.5.6.8 Revised Baseline Audiograms. Annual audiograms may be substituted for the baseline audiogram when, in the judgment of the professional evaluating the audiograms, the STS shown in the annual audiogram is persistent or the hearing threshold in the annual audiogram shows significant improvement over the baseline audiogram.

31.5.6.9 Clinical Referral. The RPC and/or Area Office PC and/or supervisors shall refer employees with audiograms that show an OSHA-recordable hearing loss to an audiologist, otolaryngologist, or physician, who shall review the problem audiogram and determine whether there is a need for further evaluation.

31.6 Personal Protective Equipment

31.6.1 Hearing Protection Devices

HPDs shall be made available at no cost to all employees exposed to noise at or above 82 dBA for an eight-hour TWA. Employees who have experienced an STS and/or who are exposed to noise above an eight-hour TWA of 85 dBA are required to wear hearing protection.

31.6.1.1 HPD Evaluation. HPDs must be evaluated and approved for use by the RPC and/or Area Office PC per OSHA 29 CFR 1910.95 Appendix B, “Methods for Estimating the Adequacy of Hearing Protection Attenuation.”

31.6.1.1.1 HPD ATTENUATION. Hearing protection must attenuate employee noise exposure to equal or less than 85 dBA for an eight-hour TWA.

31.6.1.2 HPD ATTENUATION REEVALUATION. The competency of HPDs shall be reevaluated whenever employee noise exposure increases to the extent that the HPDs provided may no longer provide adequate attenuation.
31.6.2 Double Hearing Protection
Employees shall be provided double hearing protection when noise levels are greater than or equal to 100 dBA. Doubling-up on hearing protection (e.g., earplugs and muffs) will increase the attenuation decibel by only 5 dB, as explained in the next paragraph.

31.6.2.1 ATTENUATION CALCULATION FOR DOUBLE HEARING PROTECTION. To calculate the attenuation offered by double hearing protection, first calculate the field-adjusted noise reduction rating (NRR) for the better protector using the standard formula (NRR – 7) × 0.5. Next, add 5 dB to this field-adjusted NRR to determine total attenuation. Finally, subtract the total attenuation from the employee’s eight-hour TWA exposure to determine attenuated exposure. For example, an employee with a TWA exposure of 100 dBA is using earplugs with an NRR of 29 and ear muffs with an NRR of 25. The field-adjusted NRR of the earplugs (the better protector) is (29 – 7) × 0.5, or 11 dB. The total attenuation with both earplugs and ear muffs is 11 dB + 5 dB, or 16 dB. The employee’s attenuated exposure is 100 dB – 16 dB, or 84 dB.

31.7 Safe Practices
31.7.1 Required Safe Work Practices
Employees in the HLPP shall follow these safe work practices:
- Always wear hearing protection in environments where noise levels are greater than 82 dBA
- Ensure that hearing protection fits properly
- Replace hearing protection if damaged or if it has lost its resiliency
- Discard disposable hearing protection at the end of the work shift
- Attend annual training to understand what audiogram results mean

31.7.2 Buy Quiet Program
Project Managers, acquisitions staff, and other appropriate staff shall implement a Buy Quiet program that includes the following elements:
- Inventory existing machinery/equipment and its noise emission level
- Implement a policy or procedure to purchase replacement equipment that, ideally, produces noise emission levels less than 85 dBA lower noise emission than the previous machinery/equipment
- Strive to purchase the most cost beneficial equipment/machinery available that produces less noise emission than the original equipment/machinery
- Use educational materials to promote Buy Quiet to employees
- Use cost-benefit analysis to determine the return on investment to show the true cost of purchasing one piece of equipment over another
31.8 Communication Requirements

31.8.1 Noise Exposure Signs

31.8.1.1 Caution Noise Levels. Post signs for all areas and/or label equipment that has noise levels between 85 and 100 dBA using the OSHA or ANSI format and the following wording:

CAUTION
High Noise Levels
Hearing Protection Required

31.8.1.2 Danger Noise Levels. Post signs for all areas and/or label equipment that has noise levels greater than or equal to 100 dBA using the OSHA or ANSI format and the following wording/pictograms:

DANGER
High Noise Levels
Double Hearing Protection Required

31.9 Definitions

Audiogram A chart, graph, or table resulting from an audiometric test that shows an individual's hearing threshold levels as a function of frequency. The test exposes an individual to various pure tones at different frequencies to determine the lowest audible level at each frequency.

Action level An eight-hour time-weighted average of 82 decibels or a dose of fifty percent.

A-weighting A measurement scale that approximates the loudness of tones relative to a reference tone. A-weighting correlates with annoyance measures and is most responsive to the middle frequencies, approximately 500 to 4000 Hz.

Baseline audiogram The audiogram against which future audiograms are compared to determine changes in hearing threshold levels.

Buy Quiet A process that attempts to reduce employee exposure to noise emissions by considering noise in the early phases of design and/or when repairing, replacing, and/or acquiring new equipment, machinery, tools, etc.

Decibel (dB) A standard unit of measurement of sound level.

Decibel, A-weighted (dBA) A relative unit of measurement of sound level that approximates the loudness of tones relative to a reference tone. See also A-weighting.

Dose The amount of actual exposure relative to the amount of allowable exposure. A 100% or greater dose represents an exposure that is hazardous.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exchange rate</td>
<td>The added or subtracted increment of decibels that requires halving or doubling the exposure time, respectively. For example, a 3 dB exchange rate requires that noise exposure time be halved for each 3 dB increase in noise level; likewise, a 5-dB exchange rate requires that exposure time be halved for each 5-dB increase.</td>
</tr>
<tr>
<td>Exposure limit</td>
<td>An eight-hour time-weighted average of 85 decibels measured on the A-scale and in slow response mode.</td>
</tr>
<tr>
<td>Hearing protection devices</td>
<td>Any device or material that is capable of being worn and reduces the level of sound entering the ear.</td>
</tr>
<tr>
<td>Noise dosimeter</td>
<td>The monitoring equipment used to determine the actual employee noise dose. The data from the dosimeter indicate the integrated TWA noise dose for the monitored worker. A dosimeter must be ANSI-approved and is worn by the employee throughout the work shift.</td>
</tr>
<tr>
<td>Noise induced hearing loss</td>
<td>A hearing loss originating in the inner ear or sensory organ (cochlea and associated structures) or the vestibulocochlear nerve (cranial nerve VIII) that is attributed to noise and for which no other etiology can be determined.</td>
</tr>
<tr>
<td>Noise reduction rating (NRR)</td>
<td>A single-number rating that attempts to describe a hearing protector according to how much it reduces the overall noise level. When estimating A-weighted noise reduction, it is important to remember to first subtract 7 dB from the NRR and then divide by 2. The NRR theoretically provides an estimate of the protection that should be met or exceeded by 98% of the wearers of a given device.</td>
</tr>
<tr>
<td>Program coordinator</td>
<td>A person that has the appropriate training and/or experience to manage, coordinate, implement, and evaluate specific program elements and/or respirator use requirements.</td>
</tr>
<tr>
<td>Recordable hearing loss</td>
<td>When an employee’s hearing test (audiogram) reveals that the employee has experienced a work-related standard threshold shift (STS) in one or both ears and the employee’s total hearing level is 25 decibels or more above audiometric zero (averaged at 2000, 3000, and 4000 Hz) in the same ear(s) as the STS. Recordable hearing loss must be recorded on the OSHA 300 log within 7 days of receiving the test results.</td>
</tr>
<tr>
<td>Sound level meter</td>
<td>The equipment used for representative area monitoring of sound levels. Sound level meters must be Type II (or better) and must meets ANSI standards.</td>
</tr>
<tr>
<td>Standard threshold shift (STS)</td>
<td>A change in hearing threshold (relative to the baseline audiogram) of an average of 10 dB or more at 2000, 3000, and 4000 Hz in one or both ears.</td>
</tr>
</tbody>
</table>
| Time-weighted average (TWA)               | The average of different exposure levels during an exposure period. For noise, given an 85 dBA exposure limit and a 3 dB exchange rate, the TWA is
calculated according to the following formula, where D = dose: TWA = 10.0 × \( \log(D/100) + 85 \).

### 31.10 References


