

## **4.3 RESPIRATORY PROTECTION**

### **National Park Service Respiratory Protection Policy**

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Parks will assess respiratory hazards in the workplace. Engineering controls, such as enclosure of the operation, general and local exhaust ventilation and substitution of less toxic materials, will be implemented to the extent feasible to control airborne exposure to harmful dusts, fogs, fumes, mists, gases, smokes, sprays or vapors. When engineering controls are not feasible, appropriate respirators shall be used in compliance with 29 CFR 1910.134, Respiratory Protection and this guidance.

Scope: This program applies to all employees and volunteers of the National Park Service who use respirators in the course of their duties.

#### **References**

1. 29 CFR 1910.134, Respiratory Protection.
2. 29 CFR 1910, Subpart Z. Toxic and Hazardous Substances.
3. 29 CFR 1910 and 1926, Agent-specific regulations.
4. 29 CFR 1910.1020, Access to Employee Exposure and Medical Records.
5. NIOSH. 1987, *Respirator Decision Logic*. DHHS (NIOSH) Publication No. 87-108.
6. ACGIH. 2003, Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices.

#### **Program Elements**

1. *Program Administration*. A Respiratory Protection Program Administrator (RPPA) shall be designated to administer, oversee and evaluate the effectiveness of the respiratory protection program. The RPPA must be qualified by training and experience to carry out these duties and responsibilities.
2. *Exposure Assessment*. The park shall assess exposures in the workplace (by way of personnel air sampling, mathematical modeling or some other objective means) to determine what hazardous exposures exist, what exposure levels are, the existence of atmospheres that are immediately dangerous to life and health (IDLH), and to determine the necessary level of respiratory protection. Hazardous exposures are those determined to be greater than OSHA-permissible exposure limits (PEL) or the Threshold Limit Values (TLV) of the American Conference of Governmental Industrial Hygienists (ACGIH) for work-shift and short-term exposures.

3. *Engineering and Administrative Controls.* Parks shall implement engineering and administrative controls, including enclosure of the operation, general and local exhaust ventilation, work practice controls and substitution of less-toxic materials to control airborne exposure to harmful dusts, fogs, fumes, mists, gases, smokes, sprays or vapors. Engineering and administrative controls will be evaluated and implemented to the extent feasible before respirators are used to control personal exposures.
4. *Written Respiratory Protection Program.* Parks shall develop and implement a written respiratory protection program including park and work-site-specific procedures for protecting workers from hazardous inhalation exposures.
5. *Respirator Selection.* All respirators shall be NIOSH-certified and must be appropriate for the chemical state and physical form of the hazard. They must also operate within NIOSH-assigned protection factors and maximum-use concentrations limitations.
6. *Medical Evaluation.* Parks shall provide a medical evaluation to determine the employee's ability to use a respirator before the employee is fit-tested or required to use a respirator in the workplace. The evaluation will be conducted by a physician or other healthcare professional licensed to provide such services. A medical evaluation will be completed as described in Appendix D. It will, at a minimum, consist of the completion and evaluation of a medical questionnaire and any other tests required by the physician or other licensed healthcare professional (PLHCP) in order to arrive at an opinion regarding the employee's ability to wear a respirator.
7. *Respirator Fit-Testing.* Tests shall be conducted to ensure the effective fit of all tight-fitting facepiece respirators.
8. *Employee Training.* Parks shall provide effective training to employees who are required to use respirators. The training must be comprehensive, understandable and recur annually (or more often if necessary) to ensure safe use.
9. *Safe Use of Respirators.* Parks shall establish and implement procedures for the proper care and use of respirators, including the following:
  - Cleaning, maintenance and storage of respirators
  - Routine and scheduled inspection
  - User seal checks
  - A cartridge and canister change schedule
  - Limitation of use in IDLH atmospheres
  - Breathing air quality for supplied air respirators
  - Emergency uses

10. *Voluntary Respirator Use.* Conditions and procedures for voluntary use of respirators under non-hazardous conditions should be established. This is to ensure that employees are informed about the limitations of respirators and that their use does not present a hazard.
11. *Record-Keeping.* The park shall establish and maintain records of exposure evaluations, personal exposure monitoring, personnel training and written information regarding medical evaluations and fit-testing.
12. *Program Evaluation.* The program shall be reviewed at least annually and be updated as necessary to reflect those changes in workplace conditions that affect respirator use.

### **Respiratory Protection Prevention Program Implementation Action Items**

- Step 1  *Designate a Respiratory Protection Program Administrator.* (The Respiratory Protection Program Administrator should be provided training sufficient to understand and carry out the requirements of the Respiratory Protection Program.)
- Step 2  *Assess Exposures, Conduct Exposure Monitoring.* (Respirator selection is based on the type and severity of hazards. For some substances such as lead, asbestos, benzene, formaldehyde and others, specific exposure monitoring methods are required by OSHA. For other hazards, exposure assessment may be conducted using objective data, mathematical modeling or personal exposure monitoring.) Table 1. Occupational Exposure Assessment.
- Step 3  *Implement Engineering and Administrative Controls to Eliminate or Reduce Exposure to Employees.* (Such controls may include eliminating the hazard by substituting less hazardous chemicals, installing and properly maintaining general dilution ventilation or local exhaust ventilation systems, and defining work practices. Frequently, a combination of methods will be necessary to protect the worker.)
- Step 4  *Prepare a Written Respiratory Protection Program.* (Follow the example provided in Appendix A, Written Respiratory Protection Program).
- Step 5  *Select Appropriate Respirators.* (Each respirator type has limitations in the protection it can provide. Guidance for appropriate selection of respirators is found in Appendix B, Respirator Selection Guide.)

- Step 6 ☐ *Establish Policy and Procedures to Follow to Ensure Safe Use.*  
(Employees must know how to: wear their respirators; conduct user seal checks, clean, maintain and store them; change cartridges and appropriate schedules; inspect equipment and air quality). See Appendix E, Safe Use of Respirators, and Appendix F, Determining Cartridge and Canister Change-Out Schedules.
- Step 7 ☐ *Provide Medical Evaluation for Respirator Wearers.* (Medical evaluations must be completed before the worker is fit-tested and allowed to wear a respirator.) See Appendix C, Medical Evaluation.
- Step 8 ☐ *Conduct Respirator Fit-Testing.* (All tight-fitting respirators that rely on a face-to-respirator seal to provide protection must be properly fitted to the worker. Fit tests may be qualitative or quantitative; however, some respirators and some uses will require quantitative fit-testing. Guidance is provided in Appendix D.)
- Step 9 ☐ *Train Employees.* See Appendix G, Employee Training.
- Step 10 ☐ *Establish Conditions for Voluntary Use of Respirators.* (Requires an evaluation of proposed uses. Provide information to employees. See Appendix H.)
- Step 11 ☐ *Set up a system to maintain records of exposure evaluations, personal exposure monitoring, personnel training and written information regarding medical evaluations and fit-testing.* See Appendix I.
- Step 12 ☐ *Evaluate Program Effectiveness Annually and Update as Necessary.*

## **Technical Appendices**

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Appendix A: Written Respiratory Protection Program

Appendix B: Respirator Selection Guide

Appendix C: Medical Evaluation

Appendix D: Respirator Fit-testing

Appendix E: Safe Use of Respirators

Appendix F: Determining Cartridge and Canister Change-Out Schedules

Appendix G: Employee Training

Appendix H: Voluntary Respirator Use

Appendix I: Record-Keeping

## **Appendix A. Written Respiratory Protection Program**

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### Written Program Requirements

Each Park shall develop and implement a written respiratory protection program with work-site-specific procedures and requirements for respirator use. The program must address the following elements:

1. Program administration and designation of program administrator.
2. Procedures for selecting respirators for use in the workplace.
3. Medical evaluations of employees required to use respirators.
4. Fit-testing procedures for tight-fitting respirators.
5. Procedures for proper use of respirators in routine and reasonably foreseeable emergency situations.
6. Procedures and schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding and otherwise maintaining respirators.
7. Procedures to ensure adequate air quality, quantity and flow of breathing air for atmosphere-supplying respirators.
8. Training of employees in the respiratory hazards to which they are potentially exposed during routine and emergency situations (see also hazard communication).
9. Conditions for voluntary use where no hazards exist.
10. Training of employees in the proper use of respirators (including placement and removal, any limitations on their use and their maintenance).
11. Procedures for regularly evaluating the effectiveness of the program.

## Sample Written Respiratory Protection Program

### **Respiratory Protection Program Your National Park**

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*Policy:* Your National Park employees have both a need and a right to know the hazards and identities of the chemicals they are exposed to when working. They also need to know what protective measures are available to prevent adverse effects from occurring. The park will provide this needed information through implementation of a Hazard Communication Program.

*Scope:* This program applies to all respiratory hazards and respirator use by park employees and volunteers. Contractors working in or for the park are responsible for providing their own respiratory protection programs and respiratory protective equipment meeting OSHA requirements.

*Reference/Authority:* RM 50B National Park Service Occupational Safety and Health Program requires parks to provide volunteers and employees protection from harmful substances in the workplace; 29 CFR 1910.160 Basic Program Elements for Federal Employee Occupational Safety and Health Programs prescribes federal agency responsibility for adherence to occupational safety and health standards promulgated under OSHA; 29 CFR 1910.134 Respiratory Protection prescribes minimum requirements for respiratory protection programs and respirator use.

#### Respiratory Protection Program Administrator (RPPA)

John Brown, Safety Manager is designated the RPPA for your park. Jane Williams, Maintenance Division, and Bill Sanders, Ranger Activities, will assist the RPPA and coordinate respiratory protection activities for their divisions.

#### Responsibilities

The Respiratory Protection Program Administrator is responsible for evaluating those tasks for which respiratory protection is thought to be necessary, determining the degree of hazard posed by the potential exposure, determining whether engineering or administrative controls are feasible, and specifying which respiratory protection device is to be used at each task. In addition, the RPPA will provide for training of workers in the selection and use of respiratory protective devices, medical evaluation, and qualitative and quantitative fit-testing, and issue necessary protective devices. The RPPA will review the adequacy of this plan and update it annually.

Supervisors will ensure each employee under his or her supervision using a respirator has received appropriate training in its use and an annual medical evaluation. Supervisors will ensure the availability of appropriate respirators and accessories, provide adequate storage facilities and encourage proper respirator equipment maintenance. Supervisors must be aware of tasks requiring the use of respiratory

protection and ensure all employees engaged in such work use the appropriate respirators at all times.

It is the responsibility of each respirator wearer to wear his or her respirator when and where required and in the manner in which he or she was trained. Respirator wearers must report any malfunctions of the respirator to their supervisors immediately. The respirator wearer must also guard against mechanical damage to the respirator, clean the respirator as instructed and store the respirator in a clean, sanitary location.

### Exposure Assessment

The park shall assess exposures in the workplace (by way of personnel air sampling, mathematical modeling or some other objective means) to determine what hazardous exposures exist, what exposures levels are, the existence of immediately dangerous to life and health (IDLH) atmospheres, and the necessary level of respiratory protection. Hazardous exposures are those determined to be greater than OSHA-permissible exposure limits (PEL) or the Threshold Limit Values (TLV) of the American Conference of Governmental Industrial Hygienists (ACGIH) for work-shift and short-term exposures.

### Engineering Controls

Parks shall implement engineering and administrative controls, including enclosure of the operation, general and local exhaust ventilation, work practice controls and substitution of less-toxic materials to control airborne exposure to harmful dusts, fogs, fumes, mists, gases, smokes, sprays or vapors. Engineering and administrative controls will be evaluated and implemented to the extent feasible before respirators are used to control personal exposures.

Supervisors will ensure the daily maintenance and function of ventilation systems used to control respiratory hazards in their shops. Ventilation systems will be evaluated at least annually to validate flow rates and capture velocities.

### Respirator Selection

All respirators shall be NIOSH-certified and must be appropriate for the chemical state and physical form of the hazard, and within NIOSH-assigned protection factors and maximum-use concentration limitations.

Respiratory hazards have been evaluated at your park to determine proper selection of respirators. Specific respirator requirements for park operations are given in Table 1. Your Park Respirator Selection Guide. For operations that have not been evaluated, or when ambient conditions, materials, processes and controls are different from those described in the Guide, the RPPA will be advised and consulted for a determination of appropriate respirator.



**Table 1. Your Park Respirator Selection Guide**

Operation	Location	Engineering Controls in Place	Hazardous Agent	Type of Respirator	Criterion	Cartridge Change-out	
						Schedule	Method
Brake shoe removal using enclosed cylinder vacuum system	Auto maint. shop	Enclosed cylinder vacuum system	Asbestos	Half-face with N100 filter; or N100 Filtering facepiece	0.1 f/cc	Every 12 brake jobs	NA
Welding in confined spaces (low-toxicity metals and galvanized)	Confined spaces	Forced air ventilation	Iron fume, zinc oxide fume	N95	5 mg/m <sup>3</sup> iron, 5 mg/m <sup>3</sup> zinc	Every month (<50 mg/m <sup>3</sup> )	NA
Painting, brush application, latex paints	Outside	Good natural ventilation		Not required		NA	NA
Painting, brush application, solvent based, low-toxicity paints	Indoors	Natural ventilation	Toluene, xylene	Not required	50 ppm toluene, 100 ppm xylene	Every 12 hours (<500 ppm, <50 % rH)	OSHA Wood Model Table
Painting, spray application, 2-part polyurethane	Spray booth	Spray booth Laminar flow exhaust ventilation	TDI, MDI	Full-face supplied air, pressure demand tight-fitting facepiece	0.005 ppm	NA	NA
Painter's assistant, mix isocyanate paints, clean equipment	Spray booth and mix station, no painting	Spray booth, side draft exhaust at mix station	TDI, MDI, MEK	Full-face supplied air, with MSA GMA organic vapor cartridge	0.005 ppm TDI, 0.005 ppm MDI, 200 ppm MEK	Every 4 hours (<600 ppm, <60% rH)	Manufacturer's data
Wood working, cutting, sanding (beech, with red cedar, oak)	Wood shop	Local exhaust ventilation	Wood dust	Half-face with N95 or filtering facepiece	1-5 mg/m <sup>3</sup>	Every month	NA
Removing rodent nests, cleaning rodent infestation, handling trapped rodents	Indoors	Natural ventilation	Communicable disease agents, hantavirus	Half-face or filtering facepiece	NA	N95	NA

### Medical Evaluation

All workers required to wear respirators will be provided a medical evaluation before they are fit-tested or permitted to wear a respirator. Evaluations will be conducted by the Bugtussle Occupational Health Clinic.

Supervisors will coordinate with the RPPA for medical evaluation and provide the following:

1. The type and weight of the respirator to be used by the employee.
2. The duration and frequency of respirator use.
3. The expected physical work effort.
4. Additional protective clothing and equipment to be worn.
5. Temperature and humidity extremes that may be encountered.

Workers will complete the OSHA questionnaire and bring it with them to the Occupational Health Clinic. Test will be conducted by the clinic as needed to determine the ability of the worker to use the respirator.

*Fit-testing:* All tight-fitting respirators will be fitted. Fit-testing will be conducted before workers are required to wear their respirators. Medical evaluations must be completed before fit-testing. The following people have been trained to conduct qualitative fit tests using the Bitrex or irritant smoke methods:

John Brown, Safety Manager  
Jane Williams, Maintenance Division

Supervisors will coordinate fit-testing with these individuals.

### Maintenance, Care and Storage of Respirators

Section supervisors will ensure that workers properly care for and maintain their respirators.

*Cleaning.* Respirators will be cleaned after each use according to the following procedures:

1. Remove filters, cartridges or canisters. Disassemble facepieces by removing speaking diaphragms, demand and pressure-demand valve assemblies, hoses or any components recommended by the manufacturer. Discard or repair any defective parts.

2. Wash components in warm (110°F maximum) water with a mild detergent or with a cleaner recommended by the manufacturer. A stiff bristle brush may be used to facilitate the removal of dirt.
3. Rinse components thoroughly in clean, warm (110°F maximum), preferably running water. Drain.
4. When the cleaner used does not contain a disinfecting agent, respirator components should be immersed for two minutes in hypochlorite solution (50 ppm of chlorine) made by adding approximately 1 milliliter of laundry bleach to 1 liter of water at 110°F, or other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.
5. Rinse components thoroughly in clean, warm (110°F maximum), preferably running water. Drain. The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on facepieces may result in dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.
6. Components should be hand-dried with a clean lint-free cloth or air-dried.
7. Reassemble facepiece, replacing filters, cartridges and canisters where necessary.
8. Test the respirator to ensure that all components work properly.

*Storage.* Respirators will be stored in Ziploc-type bags in lockers or designated storage containers.

*Inspection.* Respirators must be inspected before each use. Check respirator function, tightness of connections and the condition of the various parts including, but not limited to, the facepiece, head straps, valves, connecting tube and cartridges, canisters or filters. Check elastomeric parts for pliability and signs of deterioration.

*Repairs.* When respirators are damaged or fail inspection they must be repaired or discarded and replaced. Only the manufacturer's NIOSH-approved replacement parts designed for the respirator will be used. Repairs of air-supplied respirator regulators will be made only by a factory.

#### User Seal Checks

Both positive and negative user facepiece seal checks shall be performed by the wearer of tight-fitting respirators to ensure that an adequate seal is achieved each time the respirator is put on.

### Breathing Air Quality

On a quarterly basis, the supervisor of the Paint Shop will collect and submit a breathing air sample to AirData Laboratories for air-quality analysis. Breathing air will meet Grade D requirements. The compressor's CO alarm will be checked monthly. Sorbent beds and filters will be replaced every six months.

### Employee Training

The RPPA will provide training for all respirator wearers in the following program elements: The park's written respiratory protection program; proper use and limitations of respirators; individual responsibilities; correct respirator selection and use; and hands-on activity to ensure proper fit, user seal check procedures, inspection, cleaning, maintenance and storage of the respirator. The RPPA will provide an opportunity to become familiar with respirator use for an extended period of time in normal air. Training will be completed prior to respirator use and will be repeated at least annually. A written record of the training will be maintained by the RPPA.

### Voluntary Use of Respirators

Employees may desire to wear respirator protection for reasons of personal comfort or preference in the absence of respiratory hazards in the workplace that would require the use of a respirator. With the approval of the Respiratory Protection Program Administrator (RPPA), employees may elect to utilize filtering facepiece respirators (dust masks) under the following conditions:

- a. Voluntary use of respirators will be limited to filtering facepieces.
- b. RPPA approval is obtained after an evaluation has determined that use of the respirator will not in itself create a hazard.
- c. Voluntary users of respirators will be provided a copy of 29CFR1910.134, Appendix D, "Information for Employees Using Respirators When Not Required Under the Standard").
- d. If filtering facepiece respirators are provided by the park they will be NIOSH approved.

Record-Keeping

Training, medical evaluation and exposure assessment records will be provided by the RPPA and maintained by the Personnel Department. Copies of these records will also be maintained by the RPPA for ready reference and tracking of employees currently using respirators.

Records of cartridge change-out determinations will be maintained by the RPPA for as long as the cartridge is in service.

Program Evaluation

The RPPA will lead division supervisors in a critical review of this program annually to determine its effectiveness in addressing respiratory hazards at the park and make appropriate modifications.

Approved:

\_\_\_\_\_  
Superintendent

\_\_\_\_\_  
Date

## Appendix B. Respirator Selection Guide

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Selection of the proper respirators is made only after a determination of the potential contaminant and concentrations has been made. Selection of respirators will be made by the RPPA and may require consultation with a qualified Industrial Hygienist. All respirators will be NIOSH-approved, and selection will be consistent with NIOSH Respirator Decision Logic.<sup>1</sup> Factors that must be taken into account are:

- Effectiveness of the device against the substance of concern.
- Estimated maximum concentration of the substance in the work area.
- General environment (open shop or confined space, etc.).
- Known limitations of the respiratory protective device.
- Comfort, fit and worker acceptance.
- Other contaminants in the environment or potential for oxygen deficiency.

Supervisors shall contact the RPPA prior to non-routine work which may expose workers to hazardous substances or oxygen-deficient atmospheres.

### Types of Respirators

#### Air-Purifying Respirator

These respirators remove air contaminants by filtering, absorbing, adsorbing or chemically reacting with the contaminants as they pass through the respirator canister or cartridge. This respirator is to be used only where adequate oxygen (19.5 to 23.5 percent by volume) is available. Air-purifying respirators can be classified as follows:

- Particulate-removing respirators, which filter out dusts, fibers, fumes and mists. These respirators may be single-use disposable respirators or respirators with replaceable filters. **NOTE: Surgical masks do not provide protection against air contaminants. They are never to be used in place of an air-purifying respirator. They are for medical use only.**
- Gas- and vapor-removing respirators, which remove specific individual contaminants or a combination of contaminants by absorption, adsorption or by chemical reaction. Gas masks and chemical-cartridge respirators are examples of gas- and vapor-removing respirators.
- Combination particulate/gas- and vapor-removing respirators, which combine the respirator characteristics of both kinds of air-purifying respirators.

1. NIOSH. 1987. *Respirator Decision Logic*. DHHS (NIOSH) Publication No. 87-108

### Supplied-Air Respirators

These respirators provide breathing air independent of the environment. Such respirators are to be used when the contaminant has insufficient odor, taste or irritating warning properties, or when the contaminant is of such high concentration or toxicity that an air-purifying respirator is inadequate. Supplied-air respirators, also called air-line respirators, are classified as follows:

- **Demand.** This respirator supplies air to the user on demand (inhalation) which creates a negative pressure within the facepiece. Leakage into the facepiece may occur if there is a poor seal between the respirator and the user's face.
- **Pressure-Demand.** This respirator maintains a continuous positive pressure within the facepiece, thus preventing leakage into the facepiece.
- **Continuous Flow.** This respirator maintains a continuous flow of air through the facepiece and prevents leakage into the facepiece.

### Self-Contained Breathing Apparatus (SCBA)

This type of respirator allows the user complete independence from a fixed source of air and offers the greatest degree of protection, but it is also the most complex. Training and practice in its use and maintenance are essential. This type of device will be used in emergency situations only.

### Identification of Respirator Cartridges and Gas Mask Canisters

Respirator cartridges and canisters are designed to protect against individual or a combination of potentially hazardous atmospheric contaminants. They are specifically labeled and color-coded to indicate the type and nature of protection they provide.

## **Appendix C. Medical Evaluation**

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Using a respirator may place a physiological burden on employees that varies with the type of respirator worn, the job and workplace conditions in which the respirator is used, and the medical status of the employee. In order to determine the employee's ability to use a respirator and to ensure that use of respirators does not result in undue risk to wearer, the following medical evaluation procedures will be followed. Medical evaluations will be performed before an employee is fit-tested or required to use the respirator in the workplace.

Procedures are presented in detail in Appendix C of 29 CFR 1910.134. The process is summarized here.

1. Employees complete a medical questionnaire which is then reviewed by a physician or other licensed healthcare professional (PLHCP). The questionnaire can be found attached to this appendix.
2. The PLHCP must be provided the following information:
  - a. The type and weight of the respirator to be used by the employee.
  - b. The duration and frequency of respirator use (including use for rescue and escape).
  - c. The expected physical work effort.
  - d. Additional protective clothing and equipment to be worn.
  - e. Temperature and humidity extremes that may be encountered.
  - f. A copy of the written respiratory protection program and 29 CFR 1910.134 (e) Medical Evaluation.
3. Following the review of the medical questionnaire, further medical examination must be provided under the following circumstances:
  - a. When an employee gives a positive response to any question among questions 1 through 8 in Section 2 of the medical questionnaire.
  - b. When the initial medical examination demonstrates the need for a follow-up medical examination.



- c. When the follow-up medical examination shall include any medical tests, consultations or diagnostic procedures that the PLHCP deems necessary to make a final determination.

Evaluations will be discontinued when employee is no longer required to use a respirator.

4. The PLHCP will provide a written opinion of the employee's ability to use a respirator. The written opinion will include the following:

- a. A determination of the employee's ability to use the respirator.
- b. Limitations on the use of the respirator.
- c. Need for follow-up evaluations.
- d. A statement that the PLHCP has provided the employee with a copy of the determination.

5. Additional medical evaluations will be provided when any of the following occur:

- a. An employee reports medical signs or symptoms that are related to ability to use a respirator.
- b. A PLHCP, supervisor or the respirator program administrator informs the employer that an employee needs to be re-evaluated.
- c. Information from the respiratory protection program, including observations made during fit-testing and program evaluation, indicates a need for employee re-evaluation.
- d. A change occurs in workplace conditions (e.g., physical work effort, protective clothing, temperature) that may result in a substantial increase in the physiological burden placed on an employee.

6. If the respirator is a negative pressure respirator and the PLHCP finds a medical condition that may place the employee's health at increased risk if the respirator is used, the employer shall provide a powered air-purifying respirator (PAPR) if the PLHCP's medical evaluation finds that the employee can use such a respirator; if a subsequent medical evaluation finds that the employee is medically able to use a negative pressure respirator, then the employer is no longer required to provide a PAPR.

## **Required OSHA Respirator Medical Evaluation Questionnaire**

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To the employer: Answers to questions in Section 1, and to question 9 in Section 2 of Part A, do not require a medical examination.

To the employee:

Can you read? (circle one): Yes/No

Your employer must allow you to answer this questionnaire during normal working hours, or at a time and place that is convenient to you. To maintain your confidentiality, your employer or supervisor must not look at or review your answers, and your employer must tell you how to deliver or send this questionnaire to the healthcare professional who will review it.

**Part A. Section 1.** (Mandatory) The following information must be provided by every employee who has been selected to use any type of respirator (please print).

1. Today's date:  
\_\_\_\_\_
2. Your name:  
\_\_\_\_\_
3. Your age (to nearest year): \_\_\_\_\_
4. Sex (circle one): Male/Female
5. Your height: \_\_\_\_\_ ft. \_\_\_\_\_ in.
6. Your weight: \_\_\_\_\_ lbs.
7. Your job title: \_\_\_\_\_
8. A phone number where you can be reached by the healthcare professional who reviews this questionnaire (include the area code): \_\_\_\_\_
9. The best time to phone you at this number: \_\_\_\_\_
10. Has your employer told you how to contact the healthcare professional who will review this questionnaire? (circle one): Yes/No
11. Check the type of respirator you will use (you can check more than one category):
  - a. \_\_\_\_\_ N, R or P disposable respirator (filter-mask, non-cartridge type only).
  - b. \_\_\_\_\_ Other type (for example, half- or full-facepiece type, powered-air purifying, supplied-air, self-contained breathing apparatus).

12. Have you worn a respirator? (circle one): Yes/No

If "yes," what  
type(s): \_\_\_\_\_

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**Part A. Section 2.** (Mandatory) Questions 1 through 9 below must be answered by every employee who has been selected to use any type of respirator (please circle "yes" or "no").

1. Do you **currently** smoke tobacco, or have you smoked tobacco in the last month?  
Yes/No
  
2. Have you **ever had** any of the following conditions?
  - a. Seizures (fits): Yes/No
  - b. Diabetes (sugar disease): Yes/No
  - c. Allergic reactions that interfere with your breathing: Yes/No
  - d. Claustrophobia (fear of closed-in places): Yes/No
  - e. Trouble smelling odors: Yes/No
  
3. Have you **ever had** any of the following pulmonary or lung problems?
  - a. Asbestosis: Yes/No
  - b. Asthma: Yes/No
  - c. Chronic bronchitis: Yes/No
  - d. Emphysema: Yes/No
  - e. Pneumonia: Yes/No
  - f. Tuberculosis: Yes/No
  - g. Silicosis: Yes/No
  - h. Pneumothorax (collapsed lung): Yes/No
  - i. Lung cancer: Yes/No
  - j. Broken ribs: Yes/No
  - k. Any chest injuries or surgeries: Yes/No
  - l. Any other lung problem that you've been told about: Yes/No
  
4. Do you **currently** have any of the following symptoms of pulmonary or lung illness?
  - a. Shortness of breath: Yes/No
  - b. Shortness of breath when walking fast on level ground or walking up a slight hill or incline: Yes/No
  - c. Shortness of breath when walking with other people at an ordinary pace on level ground: Yes/No
  - d. Have to stop for breath when walking at your own pace on level ground: Yes/No
  - e. Shortness of breath when washing or dressing yourself: Yes/No

- i. Shortness of breath that interferes with your job: Yes/No
- j. Coughing that produces phlegm (thick sputum): Yes/No
- k. Coughing that wakes you early in the morning: Yes/No
- l. Coughing that occurs mostly when you are lying down: Yes/No
- m. Coughing up blood in the last month: Yes/No
- n. Wheezing: Yes/No
- o. Wheezing that interferes with your job: Yes/No
- p. m.Chest pain when you breathe deeply: Yes/No
- q. Any other symptoms that you think may be related to lung problems: Yes/No

5. Have you **ever had** any of the following cardiovascular or heart problems?

- a. Heart attack: Yes/No
- b. Stroke: Yes/No
- c. Angina: Yes/No
- d. Heart failure: Yes/No
- e. Swelling in your legs or feet (not caused by walking): Yes/No
- f. Heart arrhythmia (heart beating irregularly): Yes/No
- g. High blood pressure: Yes/No
- h. Any other heart problem that you've been told about: Yes/No

6. Have you **ever had** any of the following cardiovascular or heart symptoms?

- a. Frequent pain or tightness in your chest: Yes/No
- b. Pain or tightness in your chest during physical activity: Yes/No
- c. Pain or tightness in your chest that interferes with your job: Yes/No
- d. In the past two years, have you noticed your heart skipping or missing a beat: Yes/No
- e. Heartburn or indigestion that is not related to eating: Yes/ No
- f. Any other symptoms that you think may be related to heart or circulation problems: Yes/No

7. Do you **currently** take medication for any of the following problems?

- a. Breathing or lung problems: Yes/No
- b. Heart trouble: Yes/No
- c. Blood pressure: Yes/No
- d. Seizures (fits): Yes/No

8. If you've used a respirator, have you **ever had** any of the following problems? (If you've never used a respirator, check the following space and go to question 9.)

- a. Eye irritation: Yes/No
- b. Skin allergies or rashes: Yes/No
- c. Anxiety: Yes/No

- d. General weakness or fatigue: Yes/No
- e. Any other problem that interferes with your use of a respirator: Yes/No

9. Would you like to talk to the healthcare professional who will review this questionnaire about your answers to this questionnaire? Yes/No

Questions 10 to 15 below must be answered by every employee who has been selected to use either a full-facepiece respirator or a self-contained breathing apparatus (SCBA). For employees who have been selected to use other types of respirators, answering these questions is voluntary.

10. Have you **ever lost** vision in either eye (temporarily or permanently)? Yes/No

11. Do you **currently** have any of the following vision problems?

- a. Wear contact lenses: Yes/No
- b. Wear glasses: Yes/No
- c. Color blind: Yes/No
- d. Any other eye or vision problem: Yes/No

12. Have you **ever had** an injury to your ears, including a broken eardrum? Yes/No

13. Do you **currently** have any of the following hearing problems?

- a. Difficulty hearing: Yes/No
- b. Wear a hearing aid: Yes/No
- c. Any other hearing or ear problem: Yes/No

14. Have you **ever had** a back injury? Yes/No

15. Do you **currently** have any of the following musculoskeletal problems?

- a. Weakness in any of your arms, hands, legs or feet: Yes/No
- b. Back pain: Yes/No
- c. Difficulty fully moving your arms and legs: Yes/No
- d. Pain or stiffness when you lean forward or backward at the waist: Yes/No
- e. Difficulty fully moving your head up or down: Yes/No
- f. Difficulty fully moving your head side to side: Yes/No
- g. Difficulty bending at your knees: Yes/No
- h. Difficulty squatting to the ground: Yes/No
- i. Climbing a flight of stairs or a ladder carrying more than 25 lbs: Yes/No
- j. Any other muscle or skeletal problem that interferes with using a respirator: Yes/No

## OSHA Questionnaire, Part B

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Any of the following questions, and other questions not listed, may be added to the questionnaire at the discretion of the healthcare professional who will review the questionnaire.

1. In your present job, are you working at high altitudes (over 5,000 feet) or in a place that has lower-than-normal amounts of oxygen? Yes/No

If "yes," do you have feelings of dizziness, shortness of breath, pounding in your chest, or other symptoms when you're working under these conditions: Yes/No

2. At work or at home, have you ever been exposed to hazardous solvents, hazardous airborne chemicals (e.g., gases, fumes, or dust), or have you come into skin contact with hazardous chemicals? Yes/No

If "yes," name the chemicals if you know them: \_\_\_\_\_  
\_\_\_\_\_

3. Have you ever worked with any of the materials, or under any of the conditions, listed below?

- a. Asbestos: Yes/No
- b. Silica (e.g., in sandblasting): Yes/No
- c. Tungsten/cobalt (e.g., grinding or welding this material): Yes/No
- d. Beryllium: Yes/No
- e. Aluminum: Yes/No
- f. Coal (for example, mining): Yes/No
- g. Iron: Yes/No
- h. Tin: Yes/No
- i. Dusty environments: Yes/No
- j. Any other hazardous exposures: Yes/No

If "yes," describe these exposures: \_\_\_\_\_  
\_\_\_\_\_

4. List any second jobs or side businesses you have: \_\_\_\_\_  
\_\_\_\_\_

5. List your previous occupations: \_\_\_\_\_  
\_\_\_\_\_

6. List your current and previous hobbies: \_\_\_\_\_  
\_\_\_\_\_

7. Have you been in the military services? Yes/No

If "yes," were you exposed to biological or chemical agents (either in training or combat): Yes/No

8. Have you ever worked on a HAZMAT team? Yes/No

9. Other than medications for breathing and lung problems, heart trouble, blood pressure and seizures mentioned earlier in this questionnaire, are you taking any other medications for any reason (including over-the-counter medications): Yes/No

If "yes," name the medications if you know them: \_\_\_\_\_

10. Will you be using any of the following items with your respirator(s)?

- a. a HEPA filters: Yes/No
- b. Canisters (for example, gas masks): Yes/No
- c. Cartridges: Yes/No

11. How often are you expected to use the respirator(s) (circle "yes" or "no" for all answers that apply to you)?:

- a. Escape only (no rescue): Yes/No
- b. Emergency rescue only: Yes/No
- c. Less than 5 hours per week: Yes/No
- d. Less than 2 hours per day: Yes/No
- e. 2 to 4 hours per day: Yes/No
- f. Over 4 hours per day: Yes/No

12. During the period you are using the respirator(s), is your work effort:

- a. **Light** (less than 200 kcal per hour): Yes/No

If "yes," how long does this period last during the average shift: \_\_\_\_\_ hrs. \_\_\_\_\_ mins.

Examples of a light work effort are sitting while writing, typing, drafting or performing light assembly work; or standing while operating a drill press (1-3 lbs.) or controlling machines.

- b. **Moderate** (200 to 350 kcal per hour): Yes/No

If "yes," how long does this period last during the average shift: \_\_\_\_\_ hrs. \_\_\_\_\_ mins.

Examples of moderate work effort are **sitting** while nailing or filing; **driving** a truck or bus in urban traffic; **standing** while drilling, nailing, performing assembly work or transferring a moderate load (about 35 lbs.) at trunk level; **walking** on a level surface about 2 mph or down a 5-degree grade about 3 mph; or **pushing** a wheelbarrow with a heavy load (about 100 lbs.) on a level surface.

c. **Heavy** (above 350 kcal per hour): Yes/No

If "yes," how long does this period last during the average shift: \_\_\_\_\_ hrs. \_\_\_\_\_ mins.

Examples of heavy work are lifting a heavy load (about 50 lbs.) from the floor to your waist or shoulder; working on a loading dock; shoveling; standing while bricklaying or chipping castings; walking up an 8-degree grade about 2 mph; climbing stairs with a heavy load (about 50 lbs.).

13. Will you be wearing protective clothing and/or equipment (other than the respirator) when you're using your respirator? Yes/No

If "yes," describe this protective clothing and/or equipment: \_\_\_\_\_  
\_\_\_\_\_

14. Will you be working under hot conditions (temperature exceeding 77°F)? Yes/No

15. Will you be working under humid conditions? Yes/No

16. Describe the work you'll be doing while you're using your respirator(s):  
\_\_\_\_\_  
\_\_\_\_\_

17. Describe any special or hazardous conditions you might encounter when you're using your respirator(s) (for example, confined spaces, life-threatening gases):  
\_\_\_\_\_  
\_\_\_\_\_

18. Provide the following information, if you know it, for each toxic substance that you'll be exposed to when you're using your respirator(s):

Name of the first toxic substance: \_\_\_\_\_

Estimated maximum exposure level per shift: \_\_\_\_\_

Duration of exposure per shift: \_\_\_\_\_



Name of the second toxic substance: \_\_\_\_\_

Estimated maximum exposure level per shift: \_\_\_\_\_

Duration of exposure per shift: \_\_\_\_\_

Name of the third toxic substance: \_\_\_\_\_

Estimated maximum exposure level per shift: \_\_\_\_\_

Duration of exposure per shift: \_\_\_\_\_

The name of any other toxic substances that you'll be exposed to while using your respirator:

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19. Describe any special responsibilities you'll have while using your respirator(s) that may affect the safety and well-being of others (e.g., rescue, security):

## Appendix D. Respirator Fit-Testing

Before an employee is required to use any respirator with a tight-fitting facepiece, the employee will be fit-tested to ensure proper facepiece seal. Fit tests will be conducted as follows:

### Fit-Testing Protocols

Fit tests will be conducted using one of several fit test protocols that are recognized by OSHA. Fit-test methods fall into two major types—qualitative (QLFT) and quantitative (QNFT). In qualitative methods, a challenge agent is used to determine whether or not the seal leaks. If there is a leak in the seal, the challenge agent elicits a response in the wearer. Response is dependent on the sensitivity of the wearer and his cooperation. Quantitative methods can not determine how great the leak is. Quantitative methods use instrumentation to determine the relative concentrations inside and outside the facepiece. Complete protocols are presented in Appendix A of 29 CFR 1910.134.

**Table D-1 Acceptable Fit-Testing Methods**

	ASSIGNED PROTECTION FACTORS*	QLFT	QNFT
Half-facepiece Negative Pressure APR	10	Yes	Yes
Full-facepiece Negative Pressure APR, used up to 10 times the PEL or TLV (fit factor of 100 required)	10	Yes	Yes
Full-facepiece Negative Pressure APR, used up to 50 times the PEL or TLV (fit factor of 500 required)	50	No	Yes
Powered Air-Purifying Respirators (PAPR) with tight-fitting facepiece**	50	Yes	Yes
Supplied-Air Respirator, or SCBA with tight-fitting facepiece used in Negative Pressure	10	Yes	Yes
Supplied-Air Respirator, or SCBA with tight-fitting facepiece used in Continuous Flow mode	50	Yes	Yes
Supplied-Air Respirator, or SCBA used in Pressure Demand Mode	10,000	Yes	Yes
SCBA Structural Firefighting, Pressure Demand Mode	10,000	Yes	Yes
SCBA or SAR-IDLH, Pressure Demand Mode	10,000	Yes	Yes
Any loose-fitting respirators, hoods and helmets	25	Fit-testing not required	

\*Based on NIOSH Respirator Decision Logic

\*\*Fit-testing of tight-fitting atmosphere-supplying respirators and tight-fitting powered air-purifying respirators shall be accomplished by performing quantitative or qualitative fit-testing in the negative pressure mode, regardless of the mode of operation (negative or positive pressure) that is used for respiratory protection.

### Retesting

Retesting is required when any of the following conditions occur:

- Annually.
- Whenever a different respirator facepiece (size, style, model or make) is used.
- When the employer, PLHCP, supervisor or program administrator makes visual observations of changes in the employee's physical condition that could affect respirator fit. Such conditions include, but are not limited to, facial scarring, dental changes, cosmetic surgery or an obvious change in body weight.
- Whenever the employee reports that the fit of the respirator is unacceptable.

### Fit-Tester Qualifications

Fit testing may be conducted by any individual who has received training and has demonstrated competency in the methods to be used.

### Records

Records of all fit tests will be retained for all respirator users until the next fit test is administered. Records must include the name of the employee; type of fit test; specific make, model, style and size of respirator tested; date of the test; and test results.

## **Appendix E. Safe Use of Respirators**

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The following guidelines should be followed to ensure that respirators are kept clean, sanitary and in good working order. Always refer to manufacturer's recommendations for maintenance and storage.

### *Cleaning Respirators*

1. Remove filters, cartridges or canisters. Disassemble facepieces by removing speaking diaphragms, demand and pressure-demand valve assemblies, hoses or any components recommended by the manufacturer. Discard or repair any defective parts.
2. Wash components in warm (110°F maximum) water with a mild detergent or with a cleaner recommended by the manufacturer. A stiff bristle brush may be used to facilitate the removal of dirt.
3. Rinse components thoroughly in clean, warm (110°F maximum), preferably running water. Drain.
4. When the cleaner used does not contain a disinfecting agent, respirator components should be immersed for two minutes in hypochlorite solution (50 ppm of chlorine) made by adding approximately 1 milliliter of laundry bleach to 1 liter of water at 110°F. Other commercially available cleansers of equivalent disinfectant quality may also be used as directed, if their use is recommended or approved by the respirator manufacturer.
5. Rinse components thoroughly in clean, warm (110°F maximum), preferably running water. Drain. The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on facepieces may result in dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.
6. Components should be air-dried or hand-dried with a clean lint-free cloth.
7. Reassemble facepiece, replacing filters, cartridges and canisters where necessary.
8. Test the respirator to ensure that all components work properly.

### Storage

Store respirators so that the facepiece sealing surfaces and valves are protected from damage, deformation and contamination. Emergency respirators must be kept accessible to the work area, stored covered and clearly marked as a respirator for emergency use.

### Inspection

Respirators must be inspected as follows:

- Prior to use and during cleaning.
- Monthly if for emergency use. In addition, functions must be checked before and after each use.
- Before carrying into the workplace, if for emergency escape only.

Inspections will include the following:

- A check of respirator function, tightness of connections and the condition of the various parts including, but not limited to, the facepiece, head straps, valves, connecting tube, and cartridges, canisters or filters.
- A check of elastomeric parts for pliability and signs of deterioration.
- Self-contained breathing apparatus shall be inspected monthly. Air and oxygen cylinders shall be maintained in a fully charged state and shall be recharged when the pressure falls to 90% of the manufacturer's recommended pressure level. The employer shall determine that the regulator and warning devices function properly.

For respirators maintained for emergency use, the employer shall:

- Certify the respirator by documenting the date the inspection was performed, the name (or signature) of the person who made the inspection, the findings, required remedial action, and a serial number or other means of identifying the inspected respirator.
- Provide this information on a tag or label that is attached to the storage compartment for the respirator, is kept with the respirator or is included in inspection reports stored as paper or electronic files. This information shall be maintained until replaced following a subsequent certification.

## Repairs

When respirators are damaged or fail inspection, they must be repaired or discarded and replaced. Repairs will be made only by persons who have been appropriately trained. Only the manufacturer's NIOSH-approved replacement parts designed for the respirator will be used. All repairs will be made according to the manufacturer's recommendations and specifications for the type and extent of repairs to be performed. Reducing and admission valves, regulators and alarms shall be adjusted or repaired only by the manufacturer.

## Breathing Air Quality

The park must ensure that compressed air used for respirators meets specifications of ANSI/Compressed Gas Association Commodity Specification for Air. These specifications include the following:

- Oxygen content (v/v) of 19.5-23.5%.
- Hydrocarbon (condensed) content of 5 milligrams per cubic meter of air or less.
- Carbon monoxide (CO) content of 10 ppm or less.
- Carbon dioxide content of 1,000 ppm or less.
- Lack of noticeable odor.

Cylinders used to supply breathing air to respirators must be tested and maintained as prescribed in the Shipping Container Specification Regulations of the Department of Transportation (49 CFR part 173 and part 178), have a certificate of analysis from the supplier that the breathing air meets the requirements for Grade D breathing air, and the moisture content in the cylinder does not exceed a dew point of -50°F at 1 atmosphere pressure.

All compressors used to supply breathing air to respirators are constructed and situated so that the air supply cannot become contaminated. They will be equipped with in-line air-purifying sorbent beds and filters to further ensure breathing-air quality. Sorbent beds and filters must be maintained and replaced or refurbished periodically following the manufacturer's instructions.

To protect breathing air from carbon monoxide, compressors that are not oil-lubricated must be monitored to ensure that carbon monoxide levels do not exceed 10 ppm. For oil lubricated compressors, a high-temperature or carbon monoxide alarm, or both, must be used to monitor carbon monoxide levels. If only high-temperature alarms are used, the air supply must be monitored at intervals sufficient to prevent carbon monoxide in the breathing air from exceeding 10 ppm.

Breathing-air couplings must be incompatible with outlets for non-irrespirable air or other gas systems.

### User Seal Checks

Facepiece seal checks shall be performed by the wearer of tight-fitting respirators to ensure that an adequate seal is achieved each time the respirator is worn. Either the positive and negative pressure checks listed in this appendix or the respirator manufacturer's recommended user seal check method shall be used. User seal checks are not substitutes for qualitative or quantitative fit tests.

- A. *Positive Pressure Check.* Close off the exhalation valve and exhale gently into the facepiece. The face fit is considered satisfactory if a slight positive pressure can be built up inside the facepiece without any evidence of outward leakage of air at the seal. For most respirators this method of leak testing requires the wearer to first remove the exhalation valve cover before closing off the exhalation valve and then carefully replacing it after the test.
- B. *Negative Pressure Check.* Close off the inlet opening of the canister or cartridge(s) by covering with the palm of the hand(s) or by replacing the filter seal(s). Inhale gently so that the facepiece collapses slightly, and hold the breath for 10 seconds. The design of the inlet opening of some cartridges cannot be effectively covered with the palm of the hand. The test can be performed by covering the inlet opening of the cartridge with a thin latex or nitrile glove. If the facepiece remains in its slightly collapsed condition and no inward leakage of air is detected, the tightness of the respirator is considered satisfactory.
- C. *Manufacturer's Recommended User Seal Check Procedures.* The respirator manufacturer's recommended procedures for performing a user seal check may be used instead of the positive and/or negative pressure check procedures provided that the employer demonstrates that the manufacturer's procedures are equally effective.

## **Appendix F. Cartridge and Canister Change-Out Schedule**

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The ability of cartridge and canister air-purifying elements to effectively remove chemical contaminants is affected by the exertion level of the worker, differences in the manufacture of the cartridge, ambient temperature, humidity and the properties and interaction of multiple contaminants.

If there is no cartridge End of Service Life Indicator (ESLI) appropriate for conditions in the employer's workplace, the park must implement a change schedule for canisters and cartridges that is based on objective information or data that will ensure that canisters and cartridges are changed before the end of their service life.

There are several methods that can be used to meet this requirement and ensure that cartridge use is not extended beyond its capacity. The method and calculations used for the determination must be documented.

- 1. Rule of Thumb:** One rule of thumb presented by the American Industrial Hygiene Association provides for a coarse estimate of service life for organic vapors.

“If a chemical's boiling point is >94°F and the concentration is less than 200 ppm, you can expect a service life of 8 hours at a normal work rate.”

**Note:**This basic rule must be modified for work rate, chemical concentration and humidity.

- Service life is inversely proportional to work rate.
- Reducing concentration by a factor of 10 will increase service life by a factor of five.
- Humidity above 85% will reduce service life by 50%.

**Note:**This rule provides only an estimate of service life and should be supported by other methods.

- 2. Mathematical Predictive Modeling:** Mathematical models may be used to predict service life. One predictive model has been developed by G.O. Wood. This model utilizes chemical and physical properties to estimate the breakthrough time. OSHA has precalculated breakthrough for several compounds and concentrations for given sorbant specifications. A second model, the Yoon-Nelson Mathematical Model, is a descriptive model that uses experimental data to calculate parameters that are then entered into the model.



- 3. Manufacturer's Objective Data:** Probably the most expeditious method is to obtain cartridge-model-specific data directly from the manufacturer. To use this method, the expected concentration of the contaminants, the relative humidity in the work area and the work rate must be known.

Manufacturers can provide breakthrough information via telephone or fax, but most have easy to use Web-based tools that can be used to calculate service life using specific information about the working conditions that you input. Several manufacturers and the Web site addresses for their service-life calculators are shown below:

MSA:

<http://www.msanet.com/msanorthamerica/msaunitedstates/resptest/index.html>

3M: <http://csrv.3m.com/csrv/>

North: <http://www.survivair.com/>

- 4. Documentation.** The park must describe in the respirator program the information and data relied upon, the basis for the canister and cartridge change schedule, and the basis for reliance on the data. A sample Cartridge Change Schedule Documentation form is provided.

## CARTRIDGE CHANGE SCHEDULE DOCUMENTATION

Job/Task: \_\_\_\_\_ Location: \_\_\_\_\_

Respirator Manufacturer: \_\_\_\_\_

Respirator Model: \_\_\_\_\_

Cartridge Model and Description: \_\_\_\_\_

### Contaminants

Chemical Name	Exposure Limit	Anticipated Concentration	Boiling Point	

### Patterns of Use:

Number of shifts per week: \_\_\_\_\_ Hours cartridge used during shift: \_\_\_\_\_

Estimated work rate  Light  Moderate  Heavy

### Environmental Data:

Maximum expected Temp: \_\_\_\_\_ °C Maximum expected rH: \_\_\_\_\_ %

### Basis for Service Life Estimate

- Rule of Thumb:
- Laboratory Data (Attach Data)
- Mathematical Model (Identify Model Used and Attach Result)
- Mole Fraction Calculation for Mixtures

Calculate the predicted service time of each material in the mixture by multiplying its mole fraction by its single substance service time. Breakthrough time for the mixture is based on the chemical with the shortest predicted service time in mixture.

Chemical	Concentration	Single Substance Service Time	Mole Fraction* Predicted Service	Time in Mixture

\*Mole fraction + ppm of chemical / total ppm of mixture

### Cartridge Change Schedule:

- Every \_\_\_\_\_ Hours
- After Each Shift
- After One Week
- Other (Specify): \_\_\_\_\_

## **Appendix G. Employee Training**

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### Respiratory Protection Program Administrator Training

The RPPA must be qualified by training and experience to carry out the duties and responsibilities of overseeing the respiratory protection program and evaluating its effectiveness. Several training programs and providers are available, such as the OSHA 222A Course.

### Employee Training

The park shall institute a training program in respiratory protection for all workers who are required to wear respirators. Employee training must be provided prior to allowing the employee to use a respirator and shall include, at a minimum, the following topics:

1. Why the respirator is necessary and how improper fit, usage or maintenance can compromise the protective effect of the respirator.
2. What the limitations and capabilities of the respirator are.
3. How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions.
4. How to inspect, put on and remove, use and check the seals of the respirator.
5. What the procedures are for maintenance and storage of the respirator.
6. How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators.
7. The general requirements of the park and the NPS Respiratory Protection Program.

At the conclusion of the training, workers must be able to demonstrate knowledge and skills.

Training will be repeated annually to provide reinforcement and updated (or more frequent) information whenever a situation arises in which it appears retraining is necessary to ensure safe respirator use. Such situations may include changes in workplace conditions or equipment or when it becomes apparent that an employee has not retained the required understanding or skill to ensure safe respirator use.

The park shall maintain a record of educational and training programs for each worker for the duration of employment plus one year. On termination of employment, the employer should provide a copy of the training record to the worker. (see Appendix F, Record-Keeping).

## **Appendix H. Voluntary Use of Respirators**

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Employees may desire to wear respirator protection for reasons of personal comfort or preference in the absence of respiratory hazards in the workplace that would require the use of a respirator. This practice shall be allowed only when certain basic requirements are met.

### *Voluntary Use of Filtering Facepiece Respirators (Dust Masks)*

*Filtering Facepiece Respirators* are negative pressure particulate respirators with the filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium. They are often referred to as dust masks.

The following conditions shall be met when respirators are used voluntarily.

1. The workplace shall be free of atmospheric hazards that would require the use of a respirator.
2. An evaluation conducted of the workplace and circumstances has determined that use of the respirator will not in itself create a hazard.
3. Voluntary use has been approved by the RPPA.
4. Voluntary users of respirators shall be provided a copy of the *Information for Employees* contained in this Appendix.

### *Voluntary Use of Respirators Other Than Filtering Facepieces*

In addition to the conditions above, medical evaluation as described in Appendix C shall be provided when respirators other than filtering facepieces are used voluntarily.

## Information for Employees Using Respirators When Not Required—Voluntary Respirator Use

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*This information shall be provided to every employee who uses a respirator on a voluntary basis when respirator use is not required.*

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for workers. However, if a respirator is used improperly or is not kept clean, the respirator itself can become a hazard to the worker. Sometimes, workers may wear respirators to avoid exposure to hazards, even if the level of hazardous substances does not exceed the limit set by OSHA standards. If your employer provides respirators for your voluntary use, or if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard.

You should do the following:

1. Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirator's limitations.
2. Choose respirators certified for use to protect against the contaminant of concern. NIOSH, the National Institute for Occupational Safety and Health of the U.S. Department of Health and Human Services, certifies respirators. A label or statement of certification should appear on the respirator or respirator packaging. It will tell you what the respirator is designed for and how much it will protect you.
3. Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designed to protect against. For example, a respirator designed to filter dust particles will not protect you against gases, vapors or very small solid particles of fumes or smoke.
4. Keep track of your respirator so that you do not mistakenly use someone else's respirator.

## **Appendix I. Record-Keeping**

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### *Fit-Test Records*

Fit-test records will be maintained until the next fit test is administered. Each fit-test record must contain the employee identification; type of fit test; date last tested; the results of the test; and the make, model and size of the respirator tested.

### *Medical Evaluations*

Medical evaluations are normally kept by the PLHCP. However, the park must maintain the PLHCP's written recommendation. This record must be maintained for the duration of employment plus one year.

### *Cartridge Change-Out Determinations*

A record will be kept of cartridge change-out schedule determinations for as long as the respirator cartridge is in service.

### *Exposure Monitoring*

All workplace exposure evaluations and personal exposure monitoring records will be maintained for the duration of employment plus one year.

### *Training Records*

Training records will be maintained for the duration of employment plus one year.