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**FSM 5100 - FIRE MANAGEMENT**

**CHAPTER 5160 - FIRE MANAGEMENT EQUIPMENT AND SUPPLIES**

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**Posting Instructions:** Amendments are numbered consecutively by title and calendar year. Post by document; remove the entire document and replace it with this amendment. Retain this transmittal as the first page(s) of this document. The last amendment to this title was 5100-2000-2 to 5100 Zero Code.

<b>New Document</b>	5160	19 Pages
<b>Superseded Document(s) by Issuance Number and Effective Date</b>	5160 Contents (Amendment 5100-98-8, 11/10/98) 5160 (Amendment 5100-98-9, 11/10/1998)	3 Pages 12 Pages

**Digest:**

This amendment makes minor editorial and format changes throughout the chapter and makes the following substantive changes:

5160.3 - Adds direction in paragraph 6 about developing new standards for caches recognized by the National Fire Equipment System (NFES). Removes an obsolete reference in paragraph 7 to the National Automated Cache System (NACS).

5160.41 - Removes National Wildfire Suppression Technologies as a program area (formerly in para. 8) in the responsibilities of the Director of Fire and Aviation Management, Washington Office, and renumbers the subsequent paragraphs.

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**Digest--Continued:**

5160.6-5160.63 - Revises and recodes the listing of the references cited in this chapter to add new references, remove obsolete references, and add information for ordering publications.

5161.05 - Revises the definition for Fire Loss/Use Rate.

5161.21 - Adds the word “Portable” to the caption for this section, “Portable Pumping Equipment” (formerly, “Pumping Equipment”).

5161.22 - Changes the caption for this section to “Mobile Fire Equipment” (formerly, “Slip-on Units”) and revises direction.

5161.23 - Changes the caption for this section to “Fire Hose Couplings” (formerly, “Fixed-Mounted, Portable, and Integral Engines”), removes direction on fixed-mount engines, and incorporates direction on couplings (formerly coded at FSM 5161.24).

5161.24 - Removes this section and recodes direction on fire hose couplings to FSM 5161.23.

5161.43 - Removes an obsolete reference to the National Automated Cache System (NACS).

5161.45-5161.45c - Changes the caption of FSM 5161.45 to “Review, Reports, and Corrective Actions” (formerly, “Review”) and adds responsibilities related to review of fire loss/use rates and related reports, action plans, documentation, and activities for the Director, Fire and Aviation Management Staff, Washington Office (FSM 5161.45a) and Regional Foresters (FSM 5161.45b). Recodes the responsibilities of Forest Supervisors to FSM 5161.45c (formerly at FSM 5161.45).

5162.1 - Removes the reference to an out-of-date publication (NFPA Handbook, Chemicals for Forest Fire Fighting) and adds correct references for current publications.

5162.2 - Adds new direction and changes the caption for this section to “Submission of Fire Chemicals for Evaluation” (formerly, “Lot Acceptance and Quality Assurance Procedures”). The direction formerly at this section has been recoded to FSM 5162.4.

5162.21 - Adds a new section, “Evaluation of Forest Fire Long-Term Retardants,” and incorporates direction formerly coded at FSM 5162.4.

5162.22 - Adds a new section, “Evaluation of Wetting Agents,” and incorporates direction formerly coded at FSM 5162.51.

5162.23 - Adds a new section, “Evaluation of Class A Foams.”

5162.24 - Adds a new section, “Evaluation of Water Enhancers.”

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**Digest--Continued:**

5162.3 - Changes the caption to “Approved Fire Chemicals” and recodes direction formerly at FSM 5162.5.

5162.4 - Clarifies and recodes at FSM 5162.4 the direction on “Lot Acceptance and Quality Assurance Procedures” formerly at FSM 5162.2.

5162.5 - Clarifies and recodes at FSM 5162.5 the direction on “Operational Quality Control” formerly at FSM 5162.3.

5162.6 - Changes the caption to “Airtanker and Retardant Base Inspections” (formerly, “Air Tanker Base Inspections”).

5162.7 - Removes the former section “Fire Chemical Application.”

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### **5160.2 - Objectives**

1. To provide at a reasonable cost the standardized, modern firefighting equipment and supplies commensurate with the type and quality needed to meet field needs.
2. To provide standardized firefighting equipment and supplies to facilitate the interchange between fire management agencies for total mobilization.
3. To establish standards for maintaining, storing, and inspecting fire management equipment and supplies.

### **5160.3 - Policy**

1. Perform all Forest Service fire equipment development tests and ensure standardization and evaluation within the framework of the equipment and materials development, testing, evaluation, and standards program (FSM 7120).
2. Ensure properly maintained firefighting tools and equipment are available on-hand in sufficient quantities to meet planned needs for a normal fire year. In determining total needs to be stocked by a Region, consider the availability of fire equipment through other Regions, other agencies, the General Services Administration (GSA), and commercial sources.
3. Make plans, by prior arrangement, for inter-regional loan of equipment:
  - a. During major fire emergencies; and
  - b. At times other than major fire emergencies; for example, natural disaster response.
4. Loan firefighting equipment to private concerns or individuals according to terms of cooperative agreements that have been executed (FSM 1590). Loan equipment to those not covered by agreements only in extreme emergencies. Arrange for trained operators for all motorized or other valuable equipment which is on loan (FSM 6412).
5. Ensure proper accountability of firefighting tools and equipment.
6. Actively participate in the interagency National Fire Equipment System (NFES) with the objective of improving existing NFES standards, developing new NFES standards, stocking fire caches to NFES standards, and participating in the interagency network of NFES-recognized caches managed in accordance with the National Interagency Support Cache Management Plan.
7. Actively participate in the Interagency Cache Business System (ICBS) with the objective of implementing and administering a single computer-based inventory system to assist in the effective management of the NFES fire caches.

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8. Ensure that GSA is used as the primary and mandatory source of supply for wildland fire suppression equipment, supplies, and protective clothing (FSH 6309.32-FAR, part 8, Required Sources of Supply).

### **5160.4 - Responsibility**

#### **5160.41 - Director, Fire and Aviation Management Staff, Washington Office**

The Director of Fire and Aviation Management has the responsibility to:

1. Assist the General Services Administration (GSA) in providing an annual Government-wide GSA Wildfire Protection Equipment and Supplies Catalog.
2. Conduct field surveys to provide GSA with estimates of:
  - a. Quantity of fire equipment and supplies to be purchased annually by each Region for recurrent needs; and
  - b. Maximum and minimum quantities of fire equipment and supplies to be stocked by the various GSA stores for emergency firefighting uses (FSM 6310).
3. Maintain current fire equipment and supply specifications.
4. Inform field offices of current Service-wide modifications of fire equipment, including sources of supply.
5. Maintain a network of Regional Fire Equipment Committees.
6. Provide funding for improvements of existing equipment and the development and testing of new equipment, systems, techniques, and procedures.
7. Provide a process to determine the National Fire Equipment Development Program needs.
8. Provide leadership in the implementation of developed products, materials, systems, and techniques.
9. Provide oversight and liaison to the Technology and Development Program.

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### **5160.42 - Regional Foresters and Forest Supervisors**

Regional Foresters and Forest Supervisors are responsible for:

1. Determining fire management equipment and supply needs, and establishing stocking levels for local fire caches.
2. Determining appropriate equipment and supply storage facilities or local caches.
3. Inspecting fire caches to determine adequacy, condition, and availability of equipment and supplies.
4. Ensuring proper accountability of firefighting tools and equipment.
5. Determining fire equipment development needs; promptly reporting on equipment failures to the Director, Fire and Aviation Management Staff, Washington Office; and ensuring that complaint procedures described in the General Services Administration (GSA) Wildland Fire Protection Equipment and Supplies Catalog are followed for reports on items procured from GSA (FSM 5160.6).
6. Cooperating with Regional and interagency fire equipment committees to obtain field input on needed equipment development or modification.
7. Providing management oversight of equipment and supplies (FSM 5161.4 - 5161.47) on all Type I and Type II incidents.
8. Ensuring that caches designated as NFES National Interagency Support Caches are managed in accordance with the National Interagency Support Cache Management Plan.

### **5160.43 - Forest Supervisors**

In addition to the responsibilities in FSM 5160.42, Forest Supervisors are responsible for:

1. Receiving equipment and supplies issued from the NFES fire cache inventory;
2. Returning fire cache items to the NFES fire cache upon completion of the incident in accordance with established return policies;
3. Accounting for lost or damaged equipment; and
4. Ensuring that reviews of fire loss/use rates are conducted, follow-up investigations are made, and actions are taken. Review of fire loss/use rates may be delegated to the Fire Management Officer on the Forest (FSM 5161.45).



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## **5160.6 - References**

### **5160.61 - Interagency**

#### **5160.61a - National Wildfire Coordinating Group**

The following National Wildfire Coordinating Group (NWCG) publications are listed in the NWCG National Fire Equipment System Catalog, Part 2: Publications. PMS 449-2. NFES #3362. These publications are available through the Publications Management System Staff, National Interagency Fire Center (NIFC), Great Basin Support Cache, 3833 S. Development Avenue, Boise, ID 83705-5354. Information on the availability of NWCG publications in electronic and paper format may be obtained from the World Wide Web/Internet at <http://www.nwcg.gov>.

1. NWCG Fire Equipment Working Team. Lot Acceptance, Quality Assurance, and Field Quality Control for Fire Retardant Chemicals. PMS 444-1. NFES #1245.
2. NWCG Fire Equipment Working Team. Wildland Fire Hose Guide. PMS 466. NFES #1308.

### **5160.62 - USDA Forest Service**

#### **5160.62a - Availability and Ordering Information**

1. Forest Service Directives. (FSM 1130; FSH 1109.12.) Most of the directives issued to the Forest Service Manual (FSM) and Forest Service Handbook (FSH) are available electronically to employees from the Directives Homepage on the FS Web/Intranet at <http://fsweb.wo.fs.fed.us/directives/index> and to the general public from the World Wide Web/Internet at <http://www.fs.fed.us/im/directives>. Information on obtaining copies of directives issued in paper format is available from these websites and from the Directives and Regulations Branch, Washington Office.

2. San Dimas Technology and Development Center (SDTDC). Publications may be obtained by writing or calling SDTDC, 444 East Bonita Avenue, San Dimas, CA 91773; (909) 599-1267. Information on ordering and on the electronic availability of publications also is available from the FS Web/Intranet at <http://fsweb.sdtc.wo.fs.fed.us> and from the World Wide Web/Internet at <http://www.fs.fed.us/eng/techdev/sdtc.htm>.

3. Missoula Technology and Development Center (MTDC). Publications may be obtained by writing or calling MTDC, 5785 Highway 10 West, Missoula, MT 59808; (406) 329-3900. Information on ordering and on the electronic availability of publications also is available from the FS Web/Intranet at <http://fsweb.mtdc.wo.fs.fed.us> and from the World Wide Web/Internet at <http://www.fs.fed.us/eng/techdev/mtdc.htm>.

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### **5160.62b - Directives and Publications**

1. USDA Forest Service. FSH 6709.11, Health and Safety Code Handbook. Forest service employees may obtain paper copies of FSH 6709.11 by completing Form AD-14 to order from the Landover Warehouse, Office of Operations (OO), Central Supply, 3222 Hubbard Road, Landover, MD 20785 (FSM 5160.62a).

2. USDA Forest Service. Manufacturer Submission Procedures for Qualification Testing of Wildland Fire Chemical Products. San Dimas Technology and Development Center Special Report, 9951 1802. Available from SDTDC (FSM 5160.62a).

3. USDA Forest Service. Water Handling Equipment Guide (1994). PMS 447-1. NFES #1275. Available from SDTDC (FSM 5160.62a).

4. USDA Forest Service. Weather Station Handbook: An Interagency Guide for Wildland Managers. PMS 426-1. NFES #1140/NFES #2140. Available from NIFC (FSM 5160.61a).

5. USDA Forest Service. Wildland Fire Engine Guide, 0051 1203-SDTDC. Available from SDTDC (FSM 5160.62a).

### **5160.63 - Publications From Other Agencies and Organizations**

1. General Services Administration (GSA). Wildland Fire Protection Equipment and Supplies Catalog. This supplement to the GSA Supply Catalog is available from GSA, General Products Center, 819 Taylor Street, Fort Worth, TX 76102-6195.

2. National Fire Protection Association (NFPA). NFPA Standard 1962, Standard for the Care, Use and Service Testing of Fire Hose Including Connections and Nozzles. NFPA, 11 Tracy Drive, Avon, MA 02322.

## **5161 - FIRE MANAGEMENT EQUIPMENT**

### **5161.02 - Objective**

To have available, account for, and utilize the kinds and quantities of equipment adequate to accomplish wildfire management activities safely, efficiently, and effectively.

### **5161.05 - Definitions**

Following are definitions of terms as recognized by the National Fire Equipment System (NFES) fire caches:

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Accountable Property.

- a. Items with a purchase price greater than \$5,000, and
- b. Sensitive items valued at less than \$5,000 (for example, radios). (For further direction on sensitive items, see FSM 6310 and FSM 6410.)

Consumable Goods. Those items normally expected to be consumed on the incident (for example, batteries, meals ready to eat, plastic canteens, cubitainers, forms, fuses, hot food containers, petroleum products, and medical supplies).

Durable Goods. Those nonaccountable items which have a useful life expectancy greater than one incident (for example, water handling accessories, tents, camp items, tools, hoses, sleeping bags, and protective clothing).

Fire Loss/Use Rate. The rate at which property and supplies are lost or damaged on an incident. It is calculated by subtracting the dollar value of inventory returned from the dollar value of inventory issued and then dividing that remainder by the dollar value of inventory issued. The reasonably anticipated fire loss/use rate is 10 to 30 percent and varies by category of equipment (rates for different categories of equipment and supplies are in FSM 5161.44, ex. 01).

### **5161.1 - Aerial Ignition Systems**

1. Two aerial ignition systems have been approved for operational use. These are:
  - a. Jellied Gas Helitorch (Model 5400 Western/Simplex) modified in accordance with the Interagency Helicopter Operations Guide (FSM 5706.1), and
  - b. Premo Mark III Aerial Ignition System (Premo Plastics Engineering, Ltd.).
2. The Director, Fire and Aviation Management Staff, Washington Office, must approve use of any other system.

### **5161.2 - Water Handling Equipment**

The National Fire Equipment System (NFES) publication, Water Handling Equipment Guide, is a primary source of specific information on water handling equipment and accessories (FSM 5160.62). See the GSA Wildland Fire Protection Equipment and Supplies Catalog for information on water handling equipment (FSM 5160.63).

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### **5161.21 - Portable Pumping Equipment**

Purchase only tested and qualified pumping equipment for operational use. The Director, Engineering Staff, Washington Office, maintains a qualified products list available for distribution. The General Services Administration (GSA) stocks several qualified units, which are listed in the GSA Wildland Fire Protection Equipment and Supplies Catalog (FSM 5160.63).

### **5161.22 - Mobile Fire Equipment**

The USDA Forest Service Wildland Fire Engine Guide (FSM 5160.62) defines the minimum required criteria for fire engines by class, including light patrol and mobile fire equipment. The Director, Fire and Aviation Management Staff, Washington Office, must approve any exceptions to this requirement for evaluation against these criteria. If fire engines are not tested against these criteria or at the San Dimas Technology and Development Center (SDTDC), Regional Foresters must provide the evaluation data to SDTDC for revision of the Wildland Fire Engine Guide as appropriate.

### **5161.23 - Fire Hose and Couplings**

Purchase hose which has been qualified by the San Dimas Technology and Development Center for Forest Service operational use. The Director, Fire and Aviation Management Staff, Washington Office, must approve any exceptions. All fire hose threads used on Forest Service pumping equipment must be in accordance with Forest Service Standard 5100-0190 in the Water Handling Equipment Guide (FSM 5160.62).

Comply with the National Fire Protection Association, NFPA Standard 1962, Standard for the Care, Use and Service Testing of Fire Hose Including Connections and Nozzles (FSM 5160.63).

## **5161.3 - Equipment Maintenance and Testing**

### **5161.31 - Pumps and Engines**

Maintain and test all pumps and engines according to performance standards in the Water Handling Equipment Guide or the Wildland Fire Engine Guide, as appropriate (FSM 5160.62).

### **5161.32 - Fire Hose**

Follow the service test procedures and equipment standards covered in the NWCG Fire Equipment Working Team publication, Wildland Fire Hose Guide (NFES 1308), and the National Fire Protection Association Standard 1962, Standard for the Care, Use and Service Testing of Fire Hose Including Connections and (FSM 5160.63).

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### **5161.33 - Fire-Weather Observation Instruments and Equipment**

For comprehensive guidance on the operation of weather stations that provide data for wildland resource management, follow the Weather Station Handbook: An Interagency Guide for Wildland Managers (FSM 5160.62).

### **5161.4 - Fire Equipment Loss/Use**

Review the fire loss/use rate for equipment and supplies on each Type I and Type II incident. Investigate all cases where the average loss/use tolerance rates in FSM 5161.44 have been exceeded.

### **5161.41 - Cache Inventory and Documentation**

Inventory by physical count and document fire cache inventories on an annual basis.

### **5161.42 - Assignment of Inventory Responsibility**

Ensure that the key duties of inventory custody and verification are separated from inventory recordkeeping in NFES caches. Specifically, warehousing and data entry responsibilities must not be entrusted to the same individual. Supervisory approval is required for all inventory adjustments which are not supported by independent documentation.

### **5161.43 - Fire Loss/Use Information**

Ensure that the NFES Cache Manager compiles fire loss/use information through the Interagency Cache Business System (ICBS). Compute a single fire loss/use rate (FSM 5161.05) for an incident where more than one NFES cache provides equipment and supplies.

### **5161.44 - Fire Loss/Use Rates**

The acceptable fire loss/use rates for equipment and supplies provided through the NFES caches are set out in exhibit 01.

At the end of the incident, return all accountable property (FSM 5161.05) to the NFES cache. For missing or damaged property, document the item on a Report of Unserviceable, Lost, or Damaged Property (Form AD-112), available electronically.

Enforcement of these fire loss/use rates and related procedures is the responsibility of the Forest Supervisor (FSM 5160.43 and 5160.44).

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**5161.44 - Exhibit 01**

**Fire Loss/Use Rates**

<u>Equipment and Supplies</u>	<u>Fire Loss/Use Rate</u>
1. Water handling accessories: valves, wyes, nozzles	10%
2. Helicopter accessories: nets, swivels, and so on	10%
3. Tents: 2-person, wall, and other types	10%
4. Camp items: heaters, flood lights, lanterns, chairs, and so on	10%
5. Tools: shovels, pulaskis, and so on	20%
6. Hose: 1", 1-1/2", and other sizes	20%
7. Backpack pumps	20%
8. Cloth sleeping bags, pads, and cots	20%
9. Clothing: Nomex shirts, pants, flight suits, and similar equipment	30%

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### **5161.45 - Reviews, Reports, and Corrective Actions**

#### **5161.45a - Responsibility of Director, Fire and Aviation Management Staff, Washington Office**

The Director, Fire and Aviation Management Staff, Washington Office, has the responsibility to:

1. Ensure that the fire loss/use corrective action plans are accomplished when fire loss/use rates exceed individual categories or overall established incident standards.
2. Perform a trend analysis from the fire loss/use reports and corrective action plans submitted by Regional Foresters.

(For the broad responsibilities of this position related to fire management equipment and supplies, see FSM 5160.41.)

#### **5161.45b - Responsibility of Regional Forester**

The Regional Forester has the responsibility to:

1. Forward all information regarding fire loss/use reports and corrective action plans to the Director, Fire and Aviation Management Staff, Washington Office.
2. Approve follow-up fire loss/use corrective action plans developed and submitted by Forest Supervisors.
3. Ensure that the fire loss/use reports and recommended follow-up action plans are submitted to the Director, Fire and Aviation Management Staff, Washington Office, within 30 days of receipt of the Forest Supervisors' reports.

(For the broad responsibilities of this position related to fire management equipment and supplies, see FSM 5160.42.)

#### **5161.45c - Responsibility of Forest Supervisor**

The Forest Supervisor is responsible for the review of fire loss/use rates and related reports, action plans, and documentation. This responsibility includes review steps to:

1. Ensure that the NFES Cache Manager serving a particular incident provides the Forest Supervisor with a fire loss/use report within 60 days after an incident returns to local management. This report shall include all information on equipment and supplies furnished by other NFES caches.

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2. Determine from the fire loss/use report if tolerance rates and requirements established in FSM 5161.44 have been followed.
3. Document findings.
  - a. If all fire loss/use rates are within acceptable limits, report this information to the Regional Forester.
  - b. If an established fire loss/use rate category percentage is exceeded or the overall established incident maximum acceptable fire loss/use rate of 15 percent is exceeded, then develop an appropriate follow-up action plan for the Forest. Forward the plan to the Regional Forester.
4. Ensure that incident management teams and NFES Cache Managers cooperate with Forest officers in providing additional information and/or documentation as requested.
5. Ensure that the fire loss/use report and recommended follow-up action plans are submitted to the Regional Forester within 30 days of receipt of NFES Cache Manager's report.
6. Ensure that reports are filed in the final documentation records for the incident.

(For the broad responsibilities of this position related to fire management equipment and supplies, see FSM 5160.42 and 5160.43.)

### **5161.46 - Equipment and Supplies Purchased with Wildland Fire Suppression Funds**

Equipment and supplies procured with Wildland Fire Suppression Funds (WFSU), which are nonstandard items not provided through the NFES cache system or which do not replace property lost or damaged during a fire, shall be placed into the fire supply system after the fire season.

### **5161.47 - Coordination**

All Regions shall develop Regional plans to coordinate the availability of equipment and supplies from brush disposal (BD) caches, cooperators, and other sources of emergency supply in the compilation of Regional inventories.

Before the fire season, each Region shall prepare an inventory of supply items maintained to NFES standards to support the firefighting supply system. These local inventory lists shall be sent to each NFES Cache Manager.



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## **5162 - FIRE MANAGEMENT CHEMICALS**

### **5162.02 - Objective**

To have available and utilize adequate types and quantities of qualified fire chemical products to accomplish fire management activities safely, efficiently, and effectively.

### **5162.03 - Policy**

Use only evaluated, approved and qualified chemicals.

### **5162.04 - Responsibility**

#### **5162.04a - Director, Fire and Aviation Management Staff, Washington Office**

The Director of Fire and Aviation Management, Washington Office, has the responsibility to approve chemicals for Forest Service operations and to administer the fire chemical qualification and evaluation program.

(For the broad responsibilities of this position related to fire management equipment and supplies, see FSM 5160.41.)

#### **5162.04b - Regional Foresters**

Regional Foresters have the responsibility to conduct annual reviews of all airtanker (fixed or portable) retardant bases.

(For the broad responsibilities of this position related to fire management equipment and supplies, see FSM 5160.42.)

### **5162.1 - Safety**

When working with fire chemicals, follow the guidelines in FSH 6709.11, Health and Safety Code Handbook (FSM 5160.62); the Interagency Airtanker Base Operation Guide (FSM 5706.1); and the Material Safety Data Sheet for each specific product. Report health, safety, environmental, and operational concerns associated with a qualified product formulation to the Director, Fire and Aviation Management Staff, Washington Office.

### **5162.2 - Submission of Fire Chemicals for Evaluation**

Submit proposals for new fire chemicals to the Director, Fire and Aviation Management Staff, Washington Office, by following the direction in the Manufacturer Submission Procedures for Qualification Testing of Wildland Fire Chemical Products (FSM 5160.6).

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### **5162.21 - Evaluation of Long-Term Fire Retardants**

Perform evaluations of long-term fire retardants in accordance with performance requirements and procedures prescribed by the current version of Forest Service Specification 5100-304. The Director, Fire and Aviation Management Staff, Washington Office, shall maintain and issue a list of qualified long-term fire retardants for Forest Service operational use.

### **5162.22 - Evaluation of Wetting Agents**

The Director, Fire and Aviation Management Staff, Washington Office, shall maintain and issue a list of qualified wetting agents for Forest Service operational use.

### **5162.23 - Evaluation of Class A Foams**

Perform evaluations of class A foams in accordance with performance requirements and procedures prescribed by the current version of Forest Service Specification 5100-307. The Director, Fire and Aviation Management Staff, Washington Office, shall maintain and issue a list of qualified class A foams for Forest Service operational use.

### **5162.24 - Evaluation of Water Enhancers**

Perform evaluations of water enhancers in accordance with performance requirements and procedures prescribed by the current version of Forest Service Specification 5100-306. The Director, Fire and Aviation Management Staff, Washington Office, shall maintain and issue a list of qualified water enhancers for Forest Service operational use.

### **5162.3 - Approved Fire Chemicals**

The Director, Fire and Aviation Management Staff, Washington Office, shall approve, maintain, and distribute a list of qualified fire chemicals for Forest Service operational use.

### **5162.4 - Lot Acceptance and Quality Assurance Procedures**

Regional Foresters shall ensure that long-term retardant delivered to retardant bases has the same formulation and physical properties observed when the product was tested and qualified (FSM 5162.21). Follow the procedures found in the NWCG Fire Equipment Working Team publication, Lot Acceptance, Quality Assurance, and Field Quality Control for Fire Retardant Chemicals (FSM 5160.61).

**FSM 5100 - FIRE MANAGEMENT**  
**CHAPTER 5160 - FIRE MANAGEMENT EQUIPMENT AND SUPPLIES**

**5162.5 - Operational Quality Control**

Regional Foresters shall ensure the quality of qualified or approved fire chemicals in operational use is maintained. Establish retardant base quality control by using procedures described in the NWCG Fire Equipment Working Team publication, Lot Acceptance, Quality Assurance, and Field Quality Control for Fire Retardant Chemicals (FSM 5160.61).

**5162.6 - Airtanker and Retardant Base Inspections**

Establish procedures for routine inspections and maintenance of airtanker and retardant bases on a regular schedule. Make seasonal inspections within 15 days following activation of Forest Service and contractor-operated bases.