

TRANSMITTAL OF RULES ADOPTED

WASHINGTON STATE AIR

FROM: POLLUTION CONTROL BOARD

(Name of Agency)

TO: CODE REVISER

LEGISLATIVE BLDG (Southwest Corner, Ground Floor)

Olympia 98501

The enclosed Permanent rules  , being order No. 11  
Emergency rules

relating to (Name of rules or description of subject matter)

Particle fallout. These rules and regulations create chapter 18-44 WAC and establish the air quality standard for particle fallout, the air quality objective, and the method of measuring and reporting.

(ALTERNATIVE A. Use only for adoption of permanent rules)

pursuant to Notice No. 2608 <sup>①</sup> filed with the code reviser on 3-26-70 <sup>②</sup> were regularly adopted as permanent rules of this agency at Spokane, Washington on 4-17-70 and are herewith filed in the office of the code reviser pursuant to chapter 34.04 RCW. The effective date of such rules shall be \_\_\_\_\_ <sup>③</sup>

(ALTERNATIVE B. Use only for adoption of emergency rules)

pursuant to its finding that the immediate adoption of these rules is necessary for the preservation of the public health, safety, or general welfare and that observance of the requirements of notice and opportunity to present views on the proposed action would be contrary to the public interest, were regularly adopted as emergency rules of this agency at \_\_\_\_\_ on \_\_\_\_\_ and are herewith filed in the office of the code reviser pursuant to chapter 34.04 RCW.

Dated this 17th day of April 1970.

STATE OF WASHINGTON  
**FILED**  
MAY 18 1970  
CODE REVISER'S OFFICE  
KET # 2477 FILE # 1

WASHINGTON STATE AIR POLLUTION CONTROL BOARD  
(AGENCY)

*Wallace Lane MD*  
By Wallace Lane, M.D.

Chairman  
Title

- ① NOTICE NUMBER AS APPEARS ON THE COPY OF NOTICE RETURNED TO YOU BY REVISER'S OFFICE (IF PROCEEDINGS WERE CONTINUED, USE NO. OF LAST NOTICE)
- ② STAMPED DATE AS APPEARS ON THE COPY OF NOTICE RETURNED TO YOU BY REVISER'S OFFICE (IF PROCEEDINGS WERE CONTINUED, USE DATE OF LAST NOTICE)
- ③ UNLESS A LATER DATE IS SPECIFIED IN THIS ORDER OR IS PRESCRIBED IN ANOTHER STATUTE, RULES ARE EFFECTIVE 30 DAYS AFTER FILING: RCW 34.04.040. LEAVE THIS SPACE BLANK EXCEPT IN SUCH SPECIAL CASES.


STATE OF WASHINGTON  
STATE AIR POLLUTION CONTROL BOARD

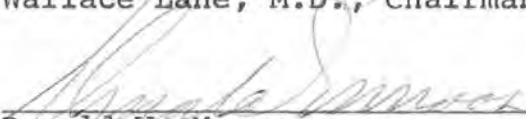
PURSUANT to the authority vested in it by the laws of the State of Washington, particularly chapter 70.94 RCW, and pursuant to chapter 34.04 RCW, the State Air Pollution Control Board does hereby adopt as permanent rules and regulations chapter 18-44 WAC, pertaining to particle fallout. These rules and regulations, as attached hereto, establish the air quality standard for particle fallout, the air quality objective, and the method of measuring and reporting.

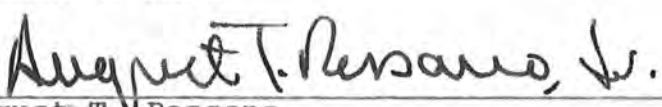
THIS order after being first recorded in the order register of this agency shall be forwarded to the Code Reviser for filing pursuant to chapter 34.04 RCW and chapter 1-12 WAC.

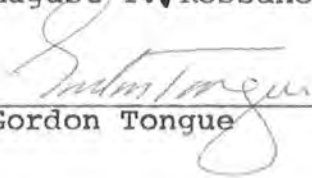
DONE in the City of Spokane, County of Spokane, State of Washington, this 17th day of April, 1970.

WASHINGTON STATE AIR POLLUTION CONTROL BOARD

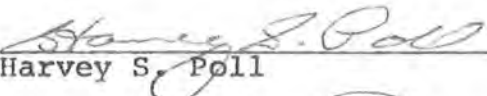
  
Wallace Lane, M.D., Chairman

  
Donald W. Moos

  
August T. Rossano

  
Gordon Tongue

John C. Ranger

  
Harvey S. Poll

  
Frank Roberts

  
Glen A. Yake

John W. Judy

Chapter 18-44

PARTICLE FALLOUT

NEW

WAC 18-44-010 PREAMBLE. In the interest of the people of the state of Washington, it is the objective of the state air pollution control board to obtain and maintain the cleanest air possible, consistent with the highest and best practicable control technology.

In areas where existing concentrations are lower than concentrations allowed by the standards enumerated below, degradation of the atmosphere should be minimized. The highest and best practicable control technology should be applied to all sources emitting particulate matter to the atmosphere unless it is determined by the responsible air pollution control agency that application of lesser technology is justified. Air quality standards should not be construed to encourage degradation of existing air quality.

NEW

WAC 18-44-020 DEFINITIONS. (1) Air Quality Objective - The concentration and exposure time of a contaminant or multiple contaminants in the ambient air below which, according to available knowledge, undesirable effects will not occur.

(2) Air Quality Standard - An established concentration, exposure time and frequency of occurrence of a contaminant or multiple contaminants in the ambient air which shall not be exceeded.

(3) Particle - A small discrete mass of solid or liquid matter. (For air pollution usage, sizes generally range from submicron to over two thousand microns.)

(4) Primary Air Mass Station (PAMS-PFO) - A type of station designed to measure contamination in an air mass and representing a relatively broad area. The sampling site shall be representative of the general area concerned and not be contaminated by any special source. The jar opening shall be a minimum of twenty feet and a maximum of one hundred fifty feet above ground level. Actual elevation should vary to prevent adverse exposure conditions caused by surrounding buildings and terrain. When mounting on rooftops, the minimum height of jar opening shall be at least five feet above the rooftop.

(5) Primary Ground Level Monitoring Station (PGLMS-PFO) - Stations designed to provide information on contaminant concentrations near the ground and provide data valid for the immediate area only. The sampler shall be ten to twenty feet above ground level with a desired optimum height of twelve feet. The jar opening shall be at least five feet above the rooftop. The sampling site shall be representative of the immediate area and not be contaminated by any unique source.

(6) Special Stations - Any station that does not meet the criteria or purpose of the standard stations are defined as special stations.

NEW

WAC 18-44-030 AIR QUALITY STANDARD. Particle fallout shall not exceed the standards enumerated below at the conditions stated.

(1) The particle fallout rate measured at a primary air mass station, ground level monitoring station or special station shall not exceed:

(a) Ten grams per square meter per month in an industrial area, or

(b) Five grams per square meter per month in an industrial area if visual observations show a presence of wood waste and the volatile fraction of the sample exceeds seventy per cent.

(c) Five grams per square meter per month in residential

and commercial areas.

(d) Three and one-half grams per square meter per month in residential and commercial areas if visual observations show the presence of wood waste and the volatile fraction of the sample exceeds seventy per cent.

(2) In recognition of natural dust loading in some areas of the state, the following exceptions shall apply to areas east of the Cascade Mountain crest. If concentrations measured at approved background locations exceed three and one-half grams per square meter per month, the particle fallout rate measured at a primary air mass station, ground level monitoring station or special station, shall not exceed:

(a) Six and one-half grams per square meter per month plus background in an industrial area, or

(b) One and one-half grams per square meter per month plus background in residential and commercial areas.

The provisions of WAC 18-44-030 (1) (b) and (1) (d) pertaining to wood waste shall continue to apply regardless of background.

NEW WAC 18-44-040 AIR QUALITY OBJECTIVE. In recognition of the need for continuing improvement of the quality of the air resource, it is the intent of the state air pollution control board to work toward the achievement of the following objective for particle fallout: The particle fallout rate shall not exceed two and a half grams per square meter per month.

NEW WAC 18-44-050 METHOD OF MEASUREMENT AND ANALYSIS. Sampling and analysis for particle fallout shall be conducted according to methods approved by and on file with the state air pollution control board (Appendix I). Methods equivalent in sensitivity, accuracy, reproducibility and selectivity to the approved standard method may be used after approved by the state air pollution control board.

NEW WAC 18-44-060 REPORTING OF DATA. (1) Local and regional agencies. Local and regional air pollution agencies sampling for particle fallout shall notify the state office of air quality control of all results exceeding the adopted standard. Monthly summaries on forms furnished by the state shall be submitted annually by April 1st and shall provide the following information:

- (a) Location of sampler.
- (b) Type of station (air mass--PAMS-PFO), ground level (PGLMS-PFO) or special station.
- (c) Time span involved.
- (d) Standard exceeded.
- (e) Concentrations recorded.

(2) If a violation of the standards is detected by the state office of air quality control, the appropriate local agency shall be notified after validation of the results. This notification shall include:

- (a) Standard exceeded.
- (b) Location.
- (c) Time span involved.
- (d) Concentrations recorded.
- (e) Request for reply indicating action planned or taken to prevent recurrence.

Control action shall be implemented by the state agency, if appropriate.



## Appendix I COLLECTION AND ANALYSIS OF PARTICLE FALLOUT.

General: Collection of particle fallout in the Pacific Northwest must be adapted to fulfill the requirements of the local region. Particle sizes exceed those found in other parts of the country. The predominance of wigwam waste burners and other lumber operations within the state necessitates procedures for detection of large cinders and fly ash particulates. The screening method recommended by ASTM, APCA and ASPHS therefore cannot be utilized in this analysis.

The use of a wet collection method was selected due to regional climatic conditions where collection of dry samples is virtually impossible except during the summer months. The following recommendations incorporate specific variations in the accepted standards of particle fallout collection and analyses methods for the needs of the area.

### Sampling Equipment: (1) Collector jar:

(a) Jar should be made of polyethylene. Glass, stainless steel, or other non-reactive material may be used. For convenience in shipping and storage, jar should be equipped with a water-tight cover.

(b) Top opening of not less than six inches in diameter.

(c) Height between two to three times diameter of top opening.

At present a five and one-half quart Tupperware jumbo canister is being used for sample collection. The recommended design for a new standard collector is shown in Figure 1. Until this unit is available from plastic manufacturers, it is recommended that the present Tupperware collector be used.

When necessary an algicide may be added to the distilled water placed in the collector. Dowicide B is recommended - five milliliters of 0.2% solution per sampler is sufficient. Use of any type of antifreeze should be discouraged unless absolutely necessary.

(2) Sampler support: Suitable unrestricted holder with a bird ring or other attachments, when necessary to preserve sampling purity.

Sampling Station Criteria: (1) Location: Station be freely exposed and not subject to interference from local sources or adjacent buildings and high objects. The top of any building, structure or natural growth should not be on a line exceeding 30° angle above the sampling position from the horizontal. Concur with other conditions as stated under PAMS and PGLMS criteria.

(2) Height: Not less than eight feet or over 150 feet above ground level following the criteria of PAMS, PGLMS and special stations. When mounting on roof tops the minimum height of the jar opening shall be five feet above the roof level.

Sampling Procedure: (1) Add distilled water to the jar. The amount of water can vary to meet existing climatic conditions.

(2) Remove lid from the collecting jar and mount the jar in the support assembly.

(3) The sampling duration time of PRIMARY stations shall be one calendar month ± two days. Special sampling time duration shall be as needed to document the problem.

Laboratory Equipment: (1) Analytical Balance - 160 gram capacity, sensitivity 0.1 milligram.

- (2) Steam bath.
- (3) Drying oven - Temperature regulation of  $\pm 2^{\circ}\text{C}$ . at  $105^{\circ}\text{C}$ .
- (4) Evaporating dish - Coors capable of holding 150-200 milliliters of sample.
- (5) Electric stirrer.
- (6) Rubber policeman broad tip.
- (7) Desiccator.
- (8) Laboratory furnace with temperature at  $800^{\circ}\text{C}$ .
- (9) Waring blender - One-gallon capacity. (Optional method)

Laboratory Analysis: (1) Selectively remove all insects, leaves, and other substances that are not considered fallout material.

(2) Scrub down the inside of the jar and quantitatively transfer to a suitable beaker.

(3) Adjust the volume of the sample by evaporation, or the addition of distilled water to exactly 500 ml.

(4) Using a stirrer, remove 100 ml. of sample for the chemical analysis, 100 ml. for soluble-insoluble analysis (if desired). The remainder is used for the determination of total particulate, ash and volatile. If chemical and soluble-insoluble analyses are not desired, the whole sample should be used to determine the total particulate, etc.

(5) To determine total particulate, ash and volatile, transfer to a pre-weighed evaporating dish and evaporate at  $105^{\circ}\text{C}$ . for twenty minutes, desiccate and weigh to determine the total ash weight. Calculate volatile portion (%).

Optional Method (from (2) above): (3a) Adjust the volume of the sample to less than 500 ml. by evaporation, or by the addition of distilled water.

(4a) Quantitatively transfer to a Waring blender for mixing. Blend and transfer to a 500 ml. graduate using the blender wash water to adjust the volume to 500 ml. Mix thoroughly.

(5a) Pipet 200 ml. from the graduate and transfer to a pre-weighed evaporating dish. Evaporate at  $105^{\circ}\text{C}$ . to dryness, desiccate and weigh to determine the total weight.

(6a) Place the evaporating dish in a muffle furnace at  $800^{\circ}\text{C}$ . for twenty minutes, desiccate and weigh to determine the total ash weight (% volatile).

(7a) Transfer the remaining 300 ml. from (4) into a beaker, heat and vacuum filter through a Buechner funnel. Adjust the volume of the filtrate to exactly 300 ml.

(8a) Transfer 100 ml. of the filtrate to a storage bottle for later chemical analysis.

(9a) Transfer the remaining 200 ml. from (7) to a pre-weighed evaporating dish, evaporate to dryness at  $105^{\circ}\text{C}$ . Desiccate and weigh to determine the total soluble weight.

(10a) Place the soluble weight evaporating dish from (9a) in a muffle furnace at  $800^{\circ}\text{C}$ . for twenty minutes, desiccate and weigh to determine the soluble ash weight.

Calculations: Total particulates and chemical analyses shall be expressed in gram, per square meter per month. Other units may be used to suite individual needs. Total particulate will be reported to the nearest 0.1 grams per square meter per month for values under 10. For values 10 or above, the data will be reported to the nearest whole number.

Volatile fractions will be reported as a percent of the total weight to the nearest one percent.

Chemical analyses, solubles and insoluble fractions will

be reported to the nearest hundredth of a gram per square meter per month.

References: (1) ASTM Standards on Methods of Atmospheric Sampling and Analysis, ASTM Committee D-22, American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pa., October, 1962.

(2) Recommended Standard Method for Continuing Dustfall Survey, Committee on Air Pollution Measurements of the Air Pollution Control Association (APM - 1, Revision 1), J. Air Poll. Control Assoc. 16:372, 1966.

(3) J. S. Nader, Dust Retention Efficiencies of Dustfall Collectors, J. Air Pollution Control Assoc. 8:35, 1958.

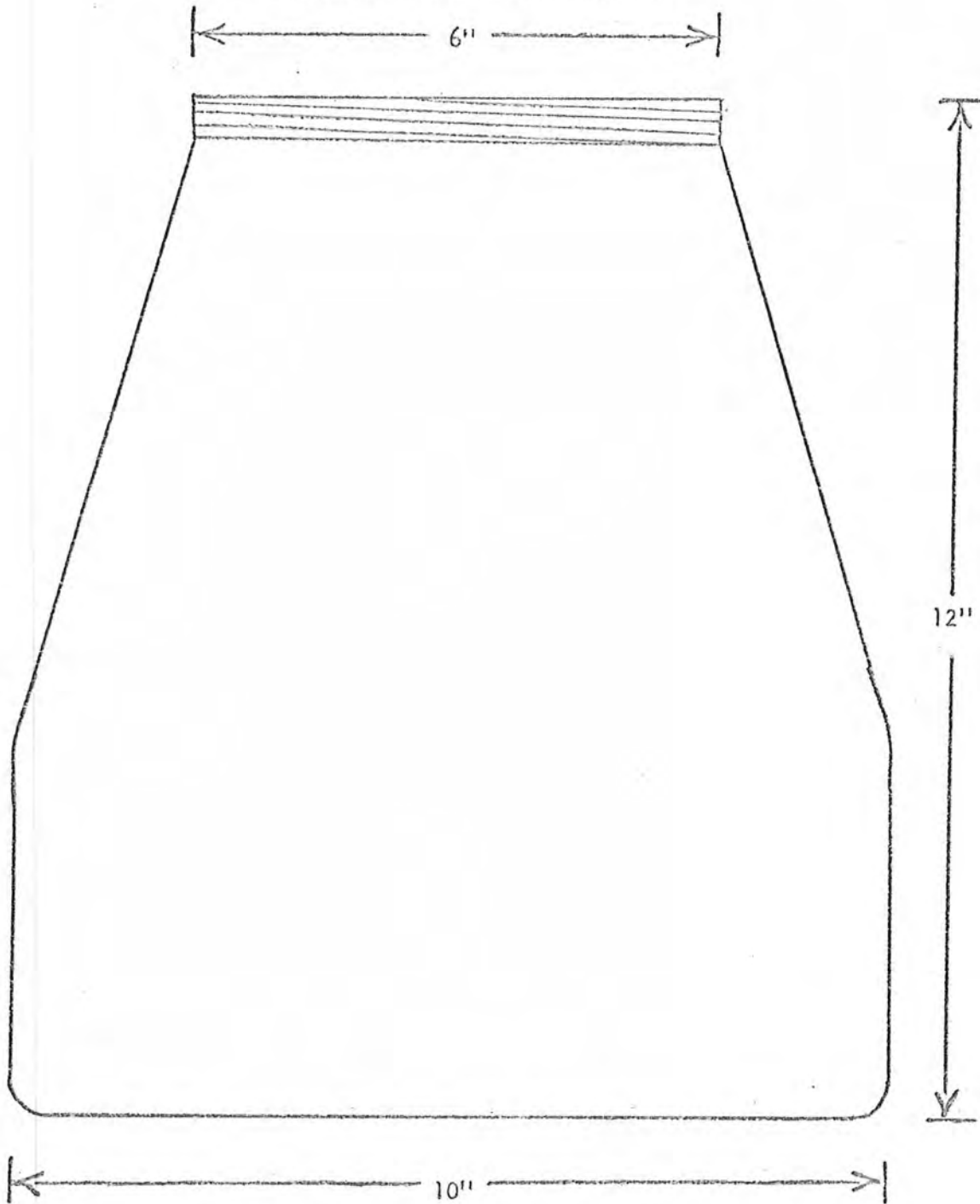
(4) H. P. Sanderson; P. Bradt; M. Katz, A Study of Dustfall on the Basis of Replicated Latin Square Arrangements of Various Types of Collectors, J. Air Poll. Control Assoc. 10:461, 1963.

(5) J. Stockham; S. Radner; E. Grove, The Variability of Dustfall Analysis Due to the Container and the Collecting Fluid, J. Air Poll. Control Assoc. 16:263, 1966.

(6) S. Hochheiser, Determination of Dustfall, Approved by the Interbranch Chemical Advisory Committee, March, 1967.



SUGGESTED DESIGN  
for  
PARTICLE FALLOUT COLLECTION



With Plastic Screw Cap  
Should Be Leak-Proof

Figure 1