WEST VIRGINIA
SECRETARY OF STATE
KEN HECHLER
ADMINISTRATIVE LAW DIVISION

Form #6

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OFFICE OF WEST VIRGINIA SECRETARY OF STATE

NOTICE OF FINAL FILING AND ADOPTION OF A LEGISLATIVE RULE AUTHORIZED BY THE WEST VIRGINIA LEGISLATURE.

AGENCY: Division of Environmental Protection Office of Air Quality TITLE NUMBER: 45CSR2

AMENDMENT TO AN EXISTING RULE: YES X, NO ____

IF YES, SERIES NUMBER OF RULE BEING AMENDED: 45CSR2

TITLE OF RULE BEING AMENDED: To Prevent and Control Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers

IF NO, SERIES NUMBER OF NEW RULE BEING PROPOSED: ____

TITLE OF RULE BEING PROPOSED: ____

THE ABOVE RULE HAS BEEN AUTHORIZED BY THE WEST VIRGINIA LEGISLATURE.

AUTHORIZATION IS CITED IN (house or senate bill number) House Bill 2134

SECTION 64-3-1(s), PASSED ON March 10, 1995.

THIS RULE IS FILED WITH THE SECRETARY OF STATE. THIS RULE BECOMES EFFECTIVE ON THE FOLLOWING DATE: May 1, 1995

Roger T Hall

AUTHORIZED SIGNATURE

Roger Hall

LEGISLATIVE HISTORY ABSTRACT
45CSR2

TO PREVENT AND CONTROL PARTICULATE AIR POLLUTION FROM THE COMBUSTION OF FUEL IN INDIRECT HEAT EXCHANGERS

Bureau of Environment
Division of Environmental Protection
Office of Air Quality
House Bill 2134, Section 64-3-1(s)

10/21/94	Filed Notice of Public Hearing with Secretary of State.
10/21/94	Initial Filing with Legislative Rule-Making Review Committee.
11/29/94	Held Public Hearing.
11/29/94	End of Public Comment Period.
02/07/95	Agency Approved Rule Filed with Secretary of State and Legislative Rule-Making Review Committee.
03/01/95	Bill of Authorization was Originated in the Senate Committee on the Judiciary. Passed by the Judiciary.
03/03/95	Originating Bill was introduced into HB 2134.
03/10/95	Passed the West Virginia Legislature.
03/24/95	Approved by the Governor.
04/30/95	Rule Final Filed with Secretary of State.
05/01/95	Effective Date of Rule.

als available from the Division of Environmental Protection."

On page 8, subsection 8.2, after the words "refresher training course" by inserting the phrase "or complete the self-study course."

On page 8 at subsection 10.1 by striking out the phrase "a cessation order and/or take other action as provided in West Virginia Code 22-3-16 and 17" and the phrase "the provisions of West Virginia Code 22-3-1 et seq., rules promulgated under that article, or".

On page 9, subsection 11.1, by striking out the subsection and inserting in lieu thereof a new subsection to read as follows: "11.1. **Suspension** - Upon service of a written notice of violation by the Director to a certified blaster, the Director may suspend his or her certification. Prior to the issuance of such an order, the certified blaster shall be granted a hearing before the Director to show cause why his or her certification should not be suspended."

On page 9, subsection 11.2, by striking out the phrase "or cessation order" in the first sentence.

On page 9, Section 12, by striking out the phrase "cessation order".

38-2d (r) The legislative rules filed in the state register on the fifteenth day of August, one thousand nine hundred ninety-four, modified by the division of environmental protection to meet the objections of the legislative rule-making review committee and refiled in the state register on the sixth day of January, one thousand nine hundred ninety-five, relating to the division of environmental protection (rules and regulations relating to abandoned mine lands and reclamation, 38 CSR 2D), are authorized.

45-2 Amend. (s) The Legislature hereby authorizes and directs the division of environmental protection to promulgate the legislative rules filed in the state register on February,

seventh, one thousand nine hundred ninety-five, relating to the prevention and control of particulate air pollution from combustion of fuel in indirect heat exchangers, 45 CSR 2, effective the * day of *, one thousand nine hundred ninety-five, with the amendments set forth below:

On page eight, section 3.4(e) after the word "operated" by adding the words "at normal operating loads";

And,

On page thirteen, section 9.4 by striking the words "monthly or", and, following the words "quarterly basis" by striking the word "as"; and by inserting the words "unless otherwise" following the words "quarterly basis" .

And,

On page thirteen, by creating a new section, designated section "45.2.10. Variances.

10.1. In the event of an unavoidable shortage of fuel having characteristics or specifications necessary for a fuel burning unit to comply with the opacity standards set forth in section 3 or any emergency situation or condition creating a threat to public safety or welfare, the Director may grant an exception to the otherwise applicable visible emission standards for a period not to exceed fifteen (15) days, provided that visible emissions during the exception period do not exceed a maximum six (6) minute average of thirty (30) percent and that a reasonable demonstration is made by the owner or operator that the emission standards under section 4 of this rule will not be exceeded during the exemption period.";

10.2. In the event a fuel burning unit employing a flue gas desulphurization system must by-pass such system because of necessary planned or unplanned maintenance, visible emissions may not exceed twenty percent (20%) opacity during such period of maintenance. The Director may require advance notice of necessary planned maintenance, including a description of the necessity of

the maintenance activity and its expected duration and may limit the duration of the variance or the amount of the excess opacity exception herein allowed. The Director shall be notified of unplanned maintenance and may limit the duration of the variance or the amount of excess opacity exception allowed during unplanned maintenance.

And, by renumbering subsequent sections.

38-2 Amend.

(t) The legislative rules filed in the state register on the nineteenth day of August, one thousand nine hundred ninety-four, relating to the division of environmental protection (surface mining and reclamation regulations, 38 CSR 2), are authorized "with the amendments set forth below"

On pages 2 and 3, by striking out subsections 1.6, 1.7 and 1.8 in their entirety;

On page 6, by inserting a new subsection 2.20, to read as follows, and renumbering subsequent subsections;

"Chemical Treatment means - the treatment of water from a surface coal mining operation using chemical reagents such as but not limited to sodium hydroxide, calcium carbonate, or anhydrous ammonia for purposes of meeting applicable state and federal effluent limitations. Chemical treatment does not include passive treatment systems such as but not limited to limestone drains, wetlands, alkaline addition, application of flyash, agricultural lime, or injection of flyash, limestone, or other minerals into underground coal operations."

On page 16, section 2, by striking out subsection 2.92 and renumbering the subsequent subsections.

On page 25, by striking the second paragraph of subsection 3.1 (o) and inserting in lieu thereof a new second paragraph 3.1 of subsection 3.1 (o), to read as follows: "Any permit application which references an approved centralized ownership and control file may be determined to be complete and accurate for the purposes of this sub-

TITLE 45
LEGISLATIVE RULE
~~AIR POLLUTION CONTROL COMMISSION~~
BUREAU OF ENVIRONMENT
DIVISION OF ENVIRONMENTAL PROTECTION
OFFICE OF AIR QUALITY

SERIES 2
TO PREVENT AND CONTROL PARTICULATE AIR
POLLUTION FROM COMBUSTION OF FUEL IN INDIRECT HEAT EXCHANGERS

§45-2-1. General.

1.1. Scope. -- Series 2 establishes emission limitations for smoke and particulate matter which are discharged from fuel burning units. The Appendix to this rule incorporates the compliance determination methods and procedures previously contained in 45CSR2A - "TP-2 - Compliance Test Procedures for Rule 2 - 'To Prevent and Control Particulate Air Pollution From Combustion of Fuel in Indirect Heat Exchangers'".

1.2. Authority.-- W.Va. Code ~~§16-20-5~~§§22-5-1 et seq.

1.3. Filing Date. -- ~~July 31, 1974~~

1.4. Effective Date. -- ~~September 1, 1974~~

1.5. Repeal of Former Rule. -- This legislative rule repeals and replaces 45CSR2A - "TP-2 - Compliance Test Procedures for Rule 2 - 'To Prevent and Control Particulate Air Pollution From Combustion of Fuel in Indirect Heat Exchangers'" which was filed on September 16, 1988 and became effective on July 14, 1989.

1.6. Incorporation by Reference - Federal Counterpart Regulation. -- Compliance test procedures established by USEPA are incorporated by reference in this rule. Since the particulate matter emissions standards and other implementing provisions of this rule were established as major elements of the State Implementation Plan (SIP) to assure attainment with the National Ambient Air Quality Standards for particulate matter, the Director has determined there is no counterpart federal rule.

§45-2-2. Definitions.

~~2.1. -- "Air Pollution", "statutory air pollution" shall have the meaning ascribed to it in section two, article twenty, chapter sixteen of the Code of West Virginia, as amended.~~

~~2.2. -- "Air Pollutants" shall mean solids, liquids, or gases which, if discharged into the air, may result in a statutory air pollution.~~

~~2.3. -- "Commission" shall mean the West Virginia Air Pollution Control Commission.~~

2.4. "Director" shall mean the Director of the West Virginia Air Pollution Control Commission.

2.5. "Person" shall mean any and all persons, natural or artificial, including any municipal, public or private corporation organized or existing under the laws of this or any other state or country, and any firm, partnership, or association of whatever nature.

2.6. "Fuel Burning Unit" shall mean and include any furnace, boiler apparatus, device, mechanism, stack, or structure used in the process of burning fuel or other combustible material for the primary purpose of producing heat or power by indirect heat transfer. For the purposes of this regulation, all fuel burning units are classified in the following categories:

(a) Type 'a' shall mean any fuel burning unit which has as its primary purpose the generation of steam or other vapor to produce electric power for sale.

(b) Type 'b' shall mean any fuel burning unit not classified as a Type 'a' or Type 'c' unit such as industrial pulverized fuel fired furnaces, cyclone furnaces, gas fired and liquid fuel fired units.

(c) Type 'c' shall mean any hand fired or stoker fired fuel burning unit not classified as a Type 'a' unit.

2.7. "Similar Unit(s)" shall mean all Type 'a', or all Type 'b', or all Type 'c' fuel burning units located at one plant.

2.8. "Fuel" shall mean any form of combustible matter (solid, liquid, vapor, or gas) that is used as a source of heat.

2.9. "Particulate Matter" shall mean any material except uncombined water that exists in a finely divided form as a liquid or solid.

2.10. "Smoke" shall mean small gasborne and airborne particulate matter arising from a process of combustion in sufficient number to be visible.

2.11. "Ringelmann Smoke Chart" shall be the Ringelmann's Scale for Grading the Density of Smoke published by the United States Bureau of Mines, or any chart, recorder, indicator, or device which is a standardized method for the measurement of smoke density which is approved by the Commission as the equivalent of said Ringelmann's Scale.

2.12. "Plant" shall mean and include all fuel burning units, source operations, equipment, and grounds utilized in an integral complex.

2.13. "Fugitive Particulate Matter" shall mean any and all particulate matter generated by any operation involving or associated with the combustion of fuel in fuel burning units which, if not confined, would be emitted directly into the open air

~~from points other than a stack outlet.~~

~~2.14. "Fugitive Particulate Matter Control System" shall mean any equipment or method used to confine, collect, or dispose of fugitive particulate matter, including, but not limited to, hoods, bins, duct work, fans, and air pollution control equipment.~~

~~2.15. "Air Pollution Control Equipment" shall mean any equipment used for collecting or confining particulate matter for the purpose of preventing or reducing the emission of this air pollutant into the open air.~~

~~2.16. "Stack", for the purposes of this regulation, shall mean, but not be limited to, any duct, control equipment exhaust, or similar apparatus, which vents gases and/or particulate matter into the open air.~~

~~2.17. "Kanawha Valley Air Basin" shall mean that area starting at the junction of the Gauley and New Rivers and terminating at the center of the Winfield Locks and extending a distance of three (3) statute miles, measured horizontally, with no reference to terrain, on each side of the center line of the Kanawha River.~~

2.1. "Air Pollutants" means solids, liquids, or gases which, if discharged into the air, may result in a statutory air pollution.

2.2. "Air Pollution" or "statutory air pollution" shall have the meaning ascribed to it in WV Code §22-5-2.

2.3. "Air Pollution Control Equipment" means any equipment used for collecting or confining particulate matter for the purpose of preventing or reducing the emission of this air pollutant into the open air.

2.4. "ASTM" means American Society for Testing and Materials.

2.5. "Control Equipment" means any equipment used for collecting or confining particulate matter for the purpose of preventing or reducing the emission of this air pollutant into the open air.

2.6. "Director" means the Director of the West Virginia Division of Environmental Protection or such other person to whom the Director has delegated authority or duties pursuant to sections six or eight, article one, chapter twenty-two of the West Virginia Code.

2.7. "Discharge Point" means the point at which particulate matter is released from a stack into open air.

2.8. "Fuel" means any form of combustible matter (solid, liquid, vapor, or gas) that is used as a source of heat.

2.9. "Fuel Burning Unit" means and includes any furnace, boiler apparatus, device, mechanism, stack, or structure used in the process of burning fuel or other

combustible material for the primary purpose of producing heat or power by indirect heat transfer. For the purposes of this rule, all fuel burning units are classified in the following categories:

(a) Type 'a' means any fuel burning unit which has as its primary purpose the generation of steam or other vapor to produce electric power for sale.

(b) Type 'b' means any fuel burning unit not classified as a Type 'a' or Type 'c' unit such as industrial pulverized-fuel-fired furnaces, cyclone furnaces, gas-fired and liquid-fuel-fired units.

(c) Type 'c' means any hand-fired or stoker-fired fuel burning unit not classified as a Type 'a' unit.

2.10. "Fugitive Particulate Matter" means any and all particulate matter generated by any operation involving or associated with the combustion of fuel in fuel burning units which, if not confined, would be emitted directly into the open air from points other than a stack outlet.

2.11. "Fugitive Particulate Matter Control System" means any equipment or method used to confine, collect, or dispose of fugitive particulate matter, including, but not limited to, hoods, bins, duct work, fans, and air pollution control equipment.

2.12. "Heat Input" means the rate of heat release from all fuels fired in all similar units vented by the test stack during the test run period.

a. 'Design Heat Input (DHI)' means the heat input level (in MM Btu/hr) for which an individual fuel burning unit has been designed to be operated during continuous operation.

b. 'Total Design Heat Input (TDHI)' means the sum of the design heat inputs for all similar units located at one plant.

c. 'Normal Maximum Operating Load (NMOL)' means the sum of the Design Heat Input levels (in MM Btu/hr) of the similar unit(s) vented by the test stack, unless the owner/operator has elected to operate one or more of the similar units vented by the test stack at or below a specified percentage of its Design Heat Input level as part of a compliance program, permit, or consent order officially accepted by the Director. In such event, the NMOL is the sum of the Design Heat Input levels or fractions thereof as appropriate (i.e., NMOL = $0.75\ DHI_1 + DHI_2$).

2.13. "Laboratory Official" means the person, qualified by experience or education, who is charged with overseeing or conducting the laboratory analysis of the collected samples. This person is responsible for ensuring the accuracy and validity of the laboratory results.

2.14. "Malfunction" means any sudden and unavoidable failure of air pollution control equipment or process equipment or of a process to operate in a normal or

usual manner. Failures that are caused entirely or in part by poor maintenance, careless operation, or any other preventable upset condition or preventable equipment breakdown shall not be considered malfunctions.

2.15."Normal Operation" when used in the context of fuel quality and combinations fired, means the type, quality, and combination of fuel(s) fired which is representative of the fuel or fuel combination fired, in the unit(s) tested, over a reasonable period prior to the test, and the fuel or fuel combination which might reasonably be expected to continue to be fired in this unit after the test. If the type of fuel, quality or combination used in the unit is variable, use the type, quality, and/or combination fired in day-to-day operation which can reasonably be expected to produce the greatest particulate matter loading to the control equipment (e.g., if coal is fired eight months out of the year and gas is fired four months out of the year, coal is to be burned during the test).

2.16."Owner or Operator" means the person responsible for the compliance of the fuel burning units subject to the provisions of the 45CSR2.

2.17."Particulate Matter" means any material except uncombined water that exists in a finely divided form as a liquid or solid.

2.18. "Person" means any and all persons, natural or artificial, including the State of West Virginia or any other State, the United States of America, any municipal, statutory, public or private corporation organized or existing under the laws of this or any other state or country, and any firm, partnership, or association of whatever nature.

2.19. "Plant" means and includes all fuel burning units, source operations, equipment, and grounds utilized in an integral complex.

2.20. "Prefilter" means a filter used in the sampling train prior to the primary filter for the purpose of reducing the particulate matter build-up on the primary filter.

2.21. "Primary Filter" means the last filter used in the sampling train to separate the particulate matter sample from the sampled stack gas.

2.22."Probe" means the part of the pitot tube assembly (nozzle, sample tube, pitot tube, filter holder(s), sensor(s)), which precedes the last filter in the sampling train and conveys the sample gas and particulate matter from the nozzle inlet to the last filter disc used for collecting stack particulate matter.

2.23."Sampling Plane" means the imaginary plane located perpendicular to the gas flow in the duct or stack at the place selected for the extraction of the required samples.

2.24. "Shut-down" means the cessation of a facility subject to this rule for any purpose.

2.25. "Similar Unit(s)" means all Type 'a', or all Type 'b', or all Type 'c' fuel burning units located at one plant.

2.26. "Smoke" means small gasborne and airborne particulate matter arising from a process of combustion in sufficient number to be visible.

2.27. "Stack", for the purposes of this rule, means, but not be limited to, any duct, control equipment exhaust, or similar apparatus, which vents gases and/or particulate matter into the open air.

2.28. "Start-up" means the setting in operation of a facility subject to this rule for any purpose.

2.29. "Test Team Supervisor" means the person, qualified by experience or education, who is charged with supervising the stack test. This person is responsible for ensuring the validity and correctness of the submitted test results.

§45-2-3. Visible Emissions of Smoke And/Or Particulate Matter Prohibited And Standards of Measurement.

3.1. ~~Visible emission requirements for fuel burning units not meeting the requirements of section 4, Weight Emission Standards.--~~No person shall cause, suffer, allow, or permit emission of smoke and/or particulate matter into the open air from any fuel burning unit which is ~~in excess of the Ringelmann limitations specified in the following tables for the designated areas and time periods: (See Table 45-2A at the end of this regulation.)~~ darker in shade or appearance than ten (10) percent opacity.

~~3.2. The provisions of subsection 3.1 of this section shall not apply to smoke emitted during the cleaning of a fire box or soot blowing the shade or appearance of which is less than the Ringelmann number specified in the following table, for a period or periods aggregating no more than eight (8) minutes per fuel burning unit in any eight (8) hour period:~~

~~Subsections---------- Ringelmann Number~~

~~3.1(a)----------3~~
~~3.1(b) and (c)----------2~~

~~3.3. Visible emission requirements for fuel burning units that meet the requirements of section 4, Weight Emission Standards.~~

~~No person shall cause, suffer, allow, or permit emissions of smoke into the open air from any fuel burning unit which is darker in shade or appearance than 0.5 Ringelmann or ten (10) percent opacity.~~

~~3.4. The provisions of subsection 3.3 shall not apply to smoke emitted during the cleaning of a fire box or soot blowing the shade or appearance of which is less than No. 1 Ringelmann or twenty (20) percent opacity for a period or periods~~

~~aggregating no more than eight (8) minutes per fuel burning unit for any eight (8) hour period.~~

~~3.5. Realizing that with present technology the provisions of this section may, in some cases, be too restrictive to be applied to the building of a new fire in a fuel burning unit, the Commission may, upon specific application by the owner and/or operator of a fuel burning unit(s), grant exemptions to these provisions. However, in no case shall these exemptions exceed the limitations set forth in the following table. (See Table 45-2B at the end of this regulation.)~~

~~If such an exemption to the provisions of this section is desired, an application in writing shall be made to the Director. From time to time the Commission shall review such exemptions to determine if they are still warranted. If the Commission revises or terminates an exemption the owner and/or operator of the affected fuel burning unit(s) shall be notified by certified mail. Such revisions or terminations shall not become effective for at least ninety (90) days after the receipt of notification by the owner and/or operator.~~

3.2. Compliance with the visible emission requirements of subsection 3.1 of this section shall be determined in accordance with 40 CFR Part 60, Appendix A, Method 9 (July 1, 1994) or by using measurements from continuous opacity monitoring systems approved by the Director. The Director may require the installation, calibration, and operation of continuous opacity monitoring systems and may establish policies for the evaluation of continuous opacity monitoring results and the determination of compliance with the visible emission requirements of subsection 3.1. of this section. Compliance opacity monitors shall not be required on fuel burning units which employ wet scrubbing systems for emission control.

3.3. If the owner or operator of a fuel burning unit can demonstrate to the satisfaction of the Director that compliance with subsection 3.1 cannot practically be achieved with respect to soot blowing operations or during the cleaning of a fire box, the Director may formally approve specific visible emission standards applicable to the fuel burning unit for soot blowing periods; provided that the exception period shall not exceed a total of twelve (12) minutes per eight hour period with visible emissions limited to forty percent (40%) opacity.

3.4. The Director may approve an alternative visible emission standard to that required under subsection 3.1 of this section, not to exceed twenty (20) percent opacity, upon the filing of a written petition by the owner or operator, which petition shall include a demonstration satisfactory to the Director:

(a) That it is technologically or economically infeasible to comply with section 3.1;

(b) That emissions from the fuel burning unit for which an alternative visible emission standard is proposed impact no area in which the National Ambient Air Quality Standards for particulate matter are being exceeded nor will any such emissions cause or contribute to a violation of the National Ambient Air Quality Standards for particulate matter in an area which currently meets such standards;

(c) That the particulate weight emission standards under section 4 of this rule are being met, as determined in accordance with the Appendix to this rule--"Compliance Test Procedures for 45CSR2";

(d) That the fuel burning unit for which an alternative visible emission standard is proposed is at all times operated and maintained in accordance with the provisions of section 9.2 of this rule;

(e) That the fuel burning unit for which an alternative visible emission standard is proposed and its associated air pollution control equipment are incapable of being adjusted or operated to meet the applicable opacity standard;

(f) That the owner or operator will install, calibrate, and operate a continuous opacity monitoring system approved by the Director, for the fuel burning unit for which an alternative visible emission standard is proposed, and will submit the results of such monitoring system to the Director on a calendar monthly basis in a format approved by the Director, provided that this provision shall not apply to fuel burning units which employ wet scrubbing systems for emission control; and

(g) That all other requirements of law and regulations enforced by the Director will be met.

§45-2-4. Weight Emission Standards.

4.1. (a) No person shall cause, suffer, allow, or permit the discharge of particulate matter into the open air from all fuel burning units located at one plant, measured in terms of pounds per hour in excess of the amount determined as follows:

(1) For Type 'a' fuel burning units, the product of 0.05 and the total design heat inputs for such units in million British Thermal Units (B.T.U.'s) per hour, provided however that no more than twelve hundred (1200) pounds per hour of particulate matter shall be discharged into the open air from all such units;

(2) For Type 'b' fuel burning units, the product of 0.09 and the total design heat inputs for such units in million B.T.U.'s per hour, provided however that no more than six hundred (600) pounds per hour of particulate matter shall be discharged into the open air from all such units; and

(3) For Type 'c' fuel burning units, in excess of the values listed in ~~the following~~ tTable 45-2A, provided however that no more than three hundred (300) pounds per hour of particulate matter shall be discharged into the open air from all such units. ~~(See Table 45-2C at the end of this regulation.)~~

For values between any two corresponding consecutive values listed in ~~this~~ tTable 45-2A, linear interpolation is to be used for both columns.

(b) Subject to the provisions of this ~~regulation~~rule, allowable emission rates for individual stacks shall be determined by the owner and/or operator and registered with the ~~Commission~~Director at the request of, and on forms provided by, the Director. Such rates shall be subject to review and approval by the Director.

The approved set of individual stack allowable emission rates shall become an official part of the compliance schedule and/or any permits concerning such source(s), and shall not be changed without the prior written approval of the Director.

(c) If the number of similar fuel burning units located at one plant, each of which is meeting the requirements of this ~~regulation~~rule, is expanded by the addition of a new unit(s), the total allowable emission rate for the new unit(s) shall be determined by the following formula. However, the maximum allowable emission rates given in subsection 4.1(a) are not to be exceeded:

$$R_e = \left(1 - \left(\frac{H_{et} - R_{et}}{H_{et}} \right) \right) H_e$$

Where,

R_e is the total allowable emission rate in pounds per hour for the new fuel burning unit(s);

H_{et} is the total design heat input in million B.T.U.'s per hour of the existing and new similar units;

R_{et} is the total allowable emission rate in pounds per hour corresponding to H_{et}; and

H_e is the total design heat input in million B.T.U.'s per hour for the new fuel burning unit(s).

4.2. ~~Addition of Sulfur Oxides to Combustion Unit Exit Gas Stream. No person shall cause, suffer, allow, or permit the addition of sulfur oxides to a combustion unit exit gas stream for the purpose of improving control equipment efficiency. Such action shall constitute a violation of this regulation.~~ No person shall cause, suffer, allow, or permit the addition of sulfur oxides to a combustion unit exit gas stream for the purpose of improving emissions control equipment efficiency unless written approval for such addition is provided by the Director.

4.3. The provisions of subsection 4.2 of this section shall not apply to combustion units in operation on ~~the effective date of this regulation;~~ or before September 1, 1974.

§45-2-5. Control of Fugitive Particulate Matter.

5.1. No person shall cause, suffer, allow, or permit any source of fugitive particulate matter to operate that is not equipped with a fugitive particulate matter control system. This system shall be operated and maintained in such a manner as to minimize the emission of fugitive particulate matter. Sources of fugitive particulate matter associated with fuel burning units shall include, but not be limited to, the following:

(a) Stockpiling of ash or fuel either in the open or in enclosures such as silos;

(b) Transport of ash in vehicles or on conveying systems, to include spillage, tracking, or blowing of particulate matter from or by such vehicles or equipment; and

(c) Ash or fuel handling systems and ash disposal areas.

§45-2-6. Registration.

6.1. ~~Within thirty (30) days after the effective date of this regulation a~~All persons owning and/or operating ~~existing~~ fuel burning units in existence on September 1, 1974 not previously registered shall have registered such units with the ~~Commission~~Director. The information required for registration shall be determined and provided in the manner specified by the Director. Registration forms should be requested from the Director by the owner and/or operator of fuel burning unit(s) subject to the provisions of this section.

6.2. The owner and/or operator of fuel burning units that are~~were~~ under construction or on which construction ~~is~~was initiated ~~within thirty (30) days after the effective date of this regulation~~as of October 1, 1974 not previously registered shall have registered such fuel burning units ~~within this thirty (30) day period~~with the Director.

§45-2-7. Permits.

7.1. After ~~the effective date of this regulation~~September 1, 1974, no person shall construct or modify any fuel burning unit without first obtaining a permit for such construction or modification. Applications for permits shall be made upon forms available from the Director and ~~shall be filed no less than ninety (90) days prior to the construction or modification. These forms~~ shall include such information as in the judgment of the Director will enable him or her to determine whether such source(s) will be so designed as to operate in conformance with the provisions of this ~~regulation~~rule and other applicable rules, the Code of West Virginia, and will not cause or contribute to the violation of ~~Secondary~~Ambient Air Quality Standards. ~~Within ninety (90) days of the receipt of an application the Director shall issue or deny such permit in accordance with the provisions of section eleven b, article twenty, chapter sixteen of the Code of West Virginia, as amended.~~

§45-2-8. Reports And Testing.

8.1. At such reasonable times as the Director may designate, the owner or operator of any fuel burning unit(s) may be required to conduct or have conducted tests to determine the compliance of such unit(s) with the emission limitations of section 4. Such tests shall be conducted in accordance with the appropriate method set forth in the Appendix to this series. The Director, or his duly authorized representative, may at his option witness or conduct such tests. Should the Director exercise his option to conduct such tests, the operator will provide all the necessary sampling connections and sampling ports to be located in such manner as the Director may require, power for test equipment, and the required safety equipment such as scaffolding, railings, and ladders to comply with generally accepted good safety practices.

~~Within a reasonable tolerance, the individual samples for such emission tests shall be extracted isokinetically, with the probe and filter media maintained at, or about, stack temperatures. Individual measurements shall be made at each of the various extraction points throughout the sampling plane in a manner that yields a composite sample and a distribution of measurements which are representative of the total stack gas flow and pollutant concentrations during the test.~~

~~The primary particulate sample collector shall be a pre-conditioned, fiberglass mat filter, certified as being at least ninety-nine (99) percent efficient in collecting 0.3 micron DOP (Dioctyl Phthalate) smoke, or a filter of equivalent properties and efficiency. The filter used shall be pre-weighed to at least one-tenth (0.1) of a miligram.~~

~~The total sample weight shall include both the particulate collected by the filter and the particulate obtained by appropriate cleaning of all devices preceding this filter in the sampling train. The total sample weight shall be determined to the nearest one-tenth (0.1) of a miligram.~~

Sufficient information on temperatures, velocities, pressures, weights and dimensional values shall be reported to the Director, with such necessary commentary as he may require to allow an accurate evaluation of the reported test results and the conditions under which they were obtained.

8.2. The Director, or his duly authorized representative, may conduct such other tests as he may deem necessary to evaluate air pollution emissions other than those noted in subsection 4.1.

8.3. The operators of fuel burning units shall submit data on operating schedules and the quality of fuel used in such units. Such data shall be reported in the manner the Director may specify, and will include, but not necessarily be limited to, information such as the number of start-ups and shut-downs, the quantity of fuel burned, and the ash, sulfur, moisture, volatile matter, and B.T.U. content.

8.4. Within a reasonable time ~~prior to~~after the start-up or shut-down of a fuel burning unit(s), the owner and/or operator of such unit(s) shall notify the Director of the ~~proposed~~ start-up or shut-down by telephone or telefax or by such

45CSR2

TO PREVENT AND CONTROL PARTICULATE AIR POLLUTION FROM COMBUSTION OF FUEL IN INDIRECT HEAT EXCHANGERS

DETERMINATION OF STRINGENCY

W. Va. Code §22-1-3 in conjunction with W. Va. Code §22-1-3a requires, in part, the Director of the Division of Environmental Protection, to determine if a new or amended environmental provision should be the same in substance as a counterpart federal regulation. If the new rule should be the same in substance, as the counterpart federal regulation, then the Director shall incorporate by reference, to the greatest extent possible, the federal counterpart rule. If the Director determines the rule should not be the same in substance as the federal counterpart rule, then the Director shall file a statement setting forth the difference between the proposed rule and the counterpart federal regulation. W. Va. Code §22-1-3a requires the Director to conduct the "stringency" determination and provide specific reasons for deviation of the proposed state rule from the federal counterpart regulation.

This rule was developed as a part of the State's Implementation Plan (SIP) pursuant to the federal Clean Air Act, as amended. The Implementation Plan has as its purpose the attainment and maintenance of attainment with the National Ambient Air Quality Standards.

This rule has been determined to incorporate necessary provisions for the attainment of the National Ambient Air Quality Standards, but has no federal counterpart, therefore no stringency determination is required.

However, assuming arguendo, that there is a federal counterpart regulation to 45CSR2, the Director hereby finds there is justification for 45CSR2 to be more stringent in some respects than the federal regulation. This finding is based upon the following reasons:

1. The more stringent visible emission standard of ten (10) percent opacity is reasonably necessary to protect, preserve, and enhance the quality of West Virginia's environment and human health, to-wit:

   a. The ten (10) percent opacity standard has been in effect since 1972 and has resulted in the State maintaining the National Ambient Air Quality Standard for particulate matter, except in one small area in the immediate area of the large steel manufacturing plants in Weirton and Follansbee, West Virginia.

   b. It is to West Virginia's advantage, both economically and environmentally, to maintain the existing high quality for particulate matter.

2. Scientific evidence supports the retention of a more stringent opacity standard since the opacity standard measures the smaller particulate matter, which can be more harmful to human health.

3. West Virginia's topography, with its steep mountains and river valleys, justifies a more stringent opacity standard than contained in the federal regulation.

other method determined by the Director. ~~If such prior notification is not practicable (e.g., if emergency conditions require prompt action, or if the requirement for the start-up and the start-up itself must necessarily occur, in time, outside the Commission's normal working hours) notification should be made within a reasonable time thereafter.~~ This requirement will be deemed to have been satisfied with respect to any unit for which approved continuous opacity monitoring data, including start-up and shut-down dates, are submitted to the Director no less frequently than on a calendar month basis.

8.5. The ~~Commission~~Director may publish, and from time to time revise, ~~detailed test procedures and~~ reporting instructions implementing the provisions of this section.

§45-2-9. ~~Compliance Programs And Schedules~~Start-ups, Shut-downs and Malfunctions.

~~9.1. In the event that a fuel burning unit(s) in existence prior to the adoption of this regulation does not meet the emission limitations, an acceptable program to fully comply with the regulation shall be developed and offered to the Commission by the person responsible for the plant. This program shall be submitted upon the request of, and within such time as shall be fixed by, the Commission. Once this program has been approved by the Commission, the owner and/or operator of such installation shall not be in violation of this regulation so long as the approved or amended program is observed. Compliance programs, schedules, and variances that have previously been issued by the Commission under Series 2 (1972) shall remain in effect until the expiration date of that compliance program, schedule, or variance.~~

~~9.2. In the event that an owner or operator of such a fuel burning unit(s) fails to submit a program or an acceptable program and schedule, the Commission shall, by order, determine the compliance program and schedule.~~

9.1. The opacity standards set forth in Section 3 shall apply at all times except in periods of start-ups, shut-downs, and malfunctions. Where the Director believes that start-ups and shut-downs are excessive in duration and/or frequency, the Director may require an owner or operator to provide a written report demonstrating that such frequent start-ups and shut-downs are necessary.

9.2. At all times, including periods of start-ups, shutdowns, and malfunctions, owners and operators shall, to the extent practicable, maintain and operate any fuel burning unit including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Director which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source.

9.3. Except as provided in subsection 9.4 the owner or operator of a fuel burning unit subject to this rule shall report to the Director, by telephone or

telefax, any malfunction of such unit or its air pollution control equipment which results in any excess particulate matter emission rate or excess opacity (i.e., emissions exceeding the standards in section 3 and 4 of this rule) within twenty-four (24) hours of becoming aware of such condition. The owner or operator shall file a certified written report concerning the malfunction with the Director within ten (10) days providing the following information:

a. A detailed explanation of the factors involved or causes of the malfunction.

b. The date and time of duration (with starting and ending times) of the period of excess emissions.

c. An estimate of the mass of excess emissions discharged during the malfunction period.

d. The maximum opacity measured or observed during the malfunction.

e. Immediate remedial actions taken at the time of the malfunction to correct or mitigate the effects of the malfunction.

f. A detailed explanation of the corrective measures or program that will be implemented to prevent a recurrence of the malfunction and a schedule for such implementation.

9.4. Excess opacity periods meeting the following conditions may be reported on a monthly or quarterly basis as required by the Director:

a. The excess opacity period does not exceed thirty (30) minutes within any 24-hour period;

b. Excess opacity does not exceed 40%; and

c. The excess opacity period is not associated with substantial failure, deactivation or by-pass of particulate matter emissions control equipment.

9.5. A malfunction, as defined under this rule, constitutes an affirmative defense to an action brought for noncompliance with the weight emission standards under section 4 of this rule if the owner or operator demonstrates to the satisfaction of the Director that the requirements of subsections 9.2 and 9.3 of this section have been met.

9.6. In any enforcement proceeding, the owner or operator seeking to establish the occurrence of a malfunction has the burden of proof.

~~§45-2-10. ---Variance.~~

~~10.1. Due to unavoidable malfunction of equipment, emissions exceeding those~~

~~provided for in this regulation may be permitted by the Director for periods not to exceed ten (10) days upon specific application to the Director. Such application shall be made within twenty-four (24) hours of the malfunction. In cases of major equipment failure, additional time periods may be granted by the Commission, provided a corrective program has been submitted by the owner or operator and approved by the Commission.~~

~~10.2. For the purpose of preventing possible equipment damage during the start-up of a fuel burning unit(s), emissions exceeding those provided for in this regulation may be permitted by the Director for periods not to exceed twenty-four (24) hours, upon specific application to the Director no less than twenty-four (24) hours prior to the start-up operation.~~

§45-2-~~11~~10. Exemptions.

~~11~~10.1. All fuel burning units having a heat input under ten (10) million B.T.U.'s per hour will be exempt from sections 4 through 9. However, failure to attain acceptable air quality in parts of some urban areas may require the mandatory control of these sources at a later date.

§45-2-11. Inconsistency Between Regulations.

11.1. In the event of any inconsistency between this regulation and Appendix and any other rule of the West Virginia Division of Environmental Protection, such inconsistency shall be resolved by the determination of the Director and such determination shall be based upon the application of the more stringent provision, term, condition, method, rule or regulation.

TABLE 45-2A

(a) From March 15, 1972, until September 1, 1972, smoke which is as dark or darker than:

Areas of State	Installation Date of Fuel Burning Unit	Ringelmann Limitations on Fuel Burning Units
Kanawha Valley Air Basin	Before April 4, 1966	2
	After April 4, 1966	1
Other		NO LIMITATIONS

(b) From September 1, 1972, until June 30, 1975, smoke which is as dark as or darker than:

Areas of State	Ringelmann Limitation on Fuel Burning Units
All	1

(c) After June 30, 1975, smoke which is darker than:

Areas of State	Ringelmann Limitations on Fuel Burning Units
All	0.5

~~TABLE-45-2B~~

~~Type of Fuel Burning Unit~~	~~Exemptions Allowed for No More than Two (2) Hours Per Start Up Operation Shall Not be as Dark or Darker in Shade or Appearance As:~~
~~Type "a" and Type "b"~~	~~No. 2 Ringelmann~~
~~Type "c"~~	~~(1) For forty five (45) minutes No. 3 Ringelmann~~ ~~(2) For the remaining seventy five (75) minutes No. 2 Ringelmann~~

TABLE 45-2C~~A~~

~~TABLE FOR TYPE "c" UNITS~~

Total Design Heat Input for All Type 'c' Fuel Burning Units Located at One Plant in Millions of B.T.U.'s Per Hour	Total Allowable Particulate Matter Emission Rate for All Type 'c' Fuel Burning Units Located at One Plant in Pounds Per Hour
10	3.4
20	5.6
40	9.0
60	11.7
80	14.4
100	16.6
200	26.4
400	42.2
600	54.0
3,333	300.0

~~45CSRTP2~~

~~TITLE 45~~
~~PROCEDURAL RULE~~
~~AIR POLLUTION CONTROL COMMISSION~~

~~SERIES TP2~~
~~"COMPLIANCE TEST PROCEDURES FOR REGULATION 2 -~~
~~"TO PREVENT AND CONTROL PARTICULATE AIR~~
~~POLLUTION FROM COMBUSTION OF FUEL IN~~
~~INDIRECT HEAT EXCHANGERS"~~
45CSR2 APPENDIX
COMPLIANCE TEST PROCEDURES FOR 45CSR2

~~§45-TP2-1.~~ Section 1. General.

~~1.1.~~ Scope. -- It is the intent and purpose of this ~~rule~~Appendix to establish stack testing procedures for determination of compliance with the weight emission standards as set forth in ~~the Commission's Regulation 2~~45CSR2 - "To Prevent and Control Particulate Air Pollution From Combustion of Fuel in Indirect Heat Exchangers". To this end, it is the intent of the ~~Commission~~Division of Environmental Protection Office of Air Quality to adopt by reference, certain of the Reference Methods and other test methods set forth in 40 CFR, Part 60, Appendix A [as of July 1, ~~1988~~1994]. These methods set forth acceptable stack testing, calibration, and laboratory procedures including appropriate apparatus with provisions for certain minor exceptions as delineated in Section 6 of this ~~rule~~Appendix.

~~1.2. Authority. ----- WV Code §16-20-5, Sections 1 through 13 inclusive~~

~~1.3. Filing Date. ----- June 15, 1989~~

~~1.4. Effective Date. ----- July 14, 1989~~

~~§45-TP2-2. Definitions.~~ Section 2. [RESERVED].

~~2.1. "Commission" means the West Virginia Air Pollution Control Commission.~~

~~2.2. "Director" means the Director of the West Virginia Air Pollution Control Commission.~~

~~2.3. "Person" means any and all persons, natural or artificial, including any municipal, public or private corporation organized or existing under the laws of this or any other state or country, and any firm, partnership, or association of whatever nature.~~

~~2.4. "Owner/Operator" means the person responsible for the compliance of the fuel burning units subject to the provisions of the Commission's Regulation 2.~~

~~2.5. "Test Team Supervisor" means the person, qualified by experience or education, who is charged with supervising the stack test. This person is responsible for ensuring the validity and correctness of the submitted test results.~~

2.6. "Laboratory Official" means the person, qualified by experience or education, who is charged with overseeing or conducting the laboratory analysis of the collected samples. This person is responsible for ensuring the accuracy and validity of the laboratory results.

2.7. "Plant" means and includes all fuel burning units, source operations, equipment, and grounds utilized in an integral complex.

2.8. "Fuel Burning Unit" means and includes any furnace, boiler apparatus, device, mechanism, stack or structure used in the process of burning fuel or other combustible material for the primary purpose of producing heat or power by indirect heat transfer. For the purposes of this rule, all fuel burning units are classified in the following categories:

a. Type 'a' means any fuel burning unit which has as its primary purpose the generation of steam or other vapor to produce electric power for sale.

b. Type 'b' means any fuel burning unit not classified as a Type 'a' or Type 'c' unit such as industrial pulverized fuel fired furnaces, cyclone furnaces, gas fired and liquid fuel fired units.

c. Type 'c' means any hand fired or stoker fired fuel burning unit not classified as a Type 'a' unit.

2.9. "Similar Units" means all Type 'a', or all Type 'b', or all Type 'c' fuel burning units located at one plant.

2.10. "Fuel" means any form of combustible matter (solid, liquid, vapor, or gas) that is used as a source of heat.

2.11. "Control Equipment" means any equipment used for collecting or confining particulate matter for the purpose of preventing or reducing the emission of this air pollutant into the open air.

2.12. "Stack" means, but not be limited to, any duct, control equipment exhaust, or similar apparatus, which vents gases and/or particulate matter into the open air.

2.13. "Particulate Matter" means any material except uncombined water that exists in a finely divided form as a liquid or solid.

2.14. "Discharge Point" means the point at which particulate matter is released from a stack into open air.

2.15. "Heat Input" means the rate of heat release from all fuels fired in all similar units vented by the test stack during the test run period.

a. "Design Heat Input (DHI)" means the heat input level (in MM Btu/hr) for which an individual fuel-burning unit has been designed to be operated during continuous operation.

b. "Total Design Heat Input (TDHI)" means the sum of the design heat inputs for all similar units located at one point.

c. "Normal Maximum Operating Load (NMOL)" means the sum of the Design Heat Input levels (in MM Btu/hr) of the similar unit(s) vented by the test stack, unless the owner/operator has elected to operate one or more of the similar units vented by the test stack at or below a specified percentage of its Design Heat Input level as part of a compliance program, permit, or consent order officially accepted by the Commission. In such event, the NMOL is the sum of the Design Heat Input levels or fractions thereof as appropriate (i.e., NMOL = $0.75\ DHI_1 + DHI_2$).

2.16. "Normal Operation" when used in the context of fuel quality and combinations fired, means the type, quality, and combination of fuel(s) fired which is representative of the fuel or fuel combination fired, in the unit(s) tested, over a reasonable period prior to the test, and the fuel or fuel combination which might reasonably be expected to continue to be fired in this unit after the test. If the type of fuel, quality or combination used in the unit is variable, use the type, quality, and/or combination fired in day-to-day operation which can reasonably be expected to produce the greatest particulate matter loading to the control equipment (i.e., if coal is fired eight months out of the year and gas is fired four months out of the year, coal is to be burned during the test).

2.17. "ASTM" means American Society for Testing and Material, 1916 Race Street, Philadelphia, Pennsylvania 19103.

2.18. "Sampling Plane" means the imaginary plane located perpendicular to the gas flow in the duct or stack at the place selected for the extraction of the required samples.

2.19. "Probe" means the part of the pitobe assembly (nozzle, sample tube, pitot tube, filter holder(s), sensor(s)), which precedes the last filter in the sampling train and conveys the sample gas and particulate matter from the nozzle inlet to the last filter disc used for collecting stack particulate matter.

2.20. "Primary Filter" means the last filter used in the sampling train to separate the particulate matter sample from the sampled stack gas.

2.21. "Prefilter" means a filter used in the sampling train prior to the primary filter for the purpose of reducing the particulate matter build-up on the primary filter.

§45-TP2-3. Section 3. Symbols.

3.1. Ab = (Sd) x (Va), Ab is the estimate of the weight of residue, prior to use, in the acetone wash volume used (grams)

3.2. An = cross-sectional area of the sample nozzle (ft^2)

3.3. As = cross-sectional area of the sample plane (ft^2)

3.4. ASTM = American Society for Testing and Materials

3.5. B = percent moisture in the sampled gas, by volume, on a wet basis, divided by 100

3.6. BE = the boiler thermal efficiency (percent)

3.7. C = 453.592 grams/pound

3.8. °C = degrees Centrigrade

3.9. cfm = cubic feet per minute

3.10. CEM = continuous emission monitoring equipment

3.11. CO = carbon monoxide

3.12. CO_2 = carbon dioxide

3.13. d = diameter of nozzle (inches)

3.14. DGR = dry gas meter reading: the sample gas volume meter reading at meter conditions (cubic feet)

3.15. ΔDGR = difference between two consecutive DGR's, the volume sampled at each sampling point (cubic feet)

3.16. EA = excess air fraction

3.17. F-factor = a factor representing a ratio of the dry flue gases generated to the calorific value of the fuel combusted (dscf/10^6 Btu)

3.18. Fi = quantity of each fuel fired in a fuel burning unit during the total test run period (in appropriate units)

3.19. °F = degrees Fahrenheit

3.20. Fp = combined correction factor for units and pitot tube deviation

3.21. ft^3 = cubic feet

3.22. ft/min = feet per minute

3.23. gm = grams

3.24. hbd = average enthalpy of steam/water leaving boiler as blowdown (Btu/lbm)

3.25. hi = average enthalpy of steam or other working fluid entering the boiler of the fuel burning unit (Btu/lbm)

3.26. ho = average enthalpy of steam or other working fluid leaving the boiler of the fuel burning unit (Btu/lbm)

3.27. ΔH = pitot tube differential reading (inches H_2O)

3.28. ΔHp = indicated differential pressure when the test pitot tube is used at the calibration point

3.29. ΔHs = indicated differential pressure when the standard pitot tube is used at the calibration point

3.30. Hg = mercury

3.31. HI = heat input per fuel burning unit(s) (10^6 Btu per hour)

3.32. H_2S = hydrogen sulfide

3.33. HVf = higher heating value of the fuel on an as fired basis (in Btu/lbm)

3.34. HVi = average Btu value of each fuel used on an as fired basis, in appropriate units (Btu/lbm, Btu/gal, etc.)

3.35. in. Hg = inches of mercury, pressure

3.36. ISKo = overall isokinetic factor, ratio of total actual sample volume (Qm) to the total isokinetic sample volume (Qo), both volumes adjusted to standard conditions

3.37. ISKp = point isokinetic factor, ratio of the actual sample volume to the isokinetic sample volume

3.38. %ISK = 100 (ISKo - 1)

3.39. Kp = coefficient of deviation of the Type S pitot tube used in sampling, determined by calibration

3.40. Ks = coefficient of deviation for a standard pitot tube

3.41. ibf = pounds force

3.42. lbm = pounds mass

3.43. Ma = particulate matter obtained from the evaporation of the acetone washings (grams)

3.44. Mbd = average mass flow rate of blowdown (lbm/hr)

3.45. Mf = particulate matter collected by filter(s) (grams)

3.46. Mg = molecular weight of gas sample on wet basis

3.47. mf = average mass flow rate of steam through the boiler (lbm/hr)

3.48. mg = milligram

3.49. ml = milliliter

3.50. Mn = Mf + Ma - Ab (grams), indicated weight of particulate matter collected by the sampling train

3.51. n = number of items in a set of related items

3.52. N_2 = nitrogen

3.53. O_2 = oxygen

3.54. Θ = sum of all extraction times at all points sampled per run (min.)

3.55. Pb = atmospheric pressure (in. Hg)

3.56. Pf = ash fraction of the non-metered fuel on an as fired basis

3.57. Pm = absolute pressure of gas at meter (in. Hg)

3.58. Pm = average absolute pressure of the sampled gas at meter conditions for the test run (in. Hg)

3.59. Ps = absolute pressure of gas in stack at sampling plane

3.60. qm = actual sample volume for each sample point adjusted to 68 °F and 29.92 in. Hg (ft^3)

3.61. Qm = sum of all qm for each test run (ft^3)

3.62. qo = volume of sampled gas for each point if isokinetic conditions were maintained, adjusted to 68 °F and 29.92 in. Hg (ft^3)

3.63. Qo = sum of all qo for each test run (ft^3)

3.64. Sd = residue found in acetone blank (gm/ml)

3.65. π = pi, 3.1416

3.66. Δt = elapsed time at each sampling point (minutes)

3.67. Tf = temperature of the primary out-of-stack filter holder, when used (°F)

3.68. Tm = temperature of gas sample at volume meter for each point (°F)

3.69. Tm = average temperature of gas sample at volume meter for test run (°F)

3.70. Ts = stack gas temperature (°F)

3.71. Va = volume of acetone wash (ml)

3.72. Vac = vacuum (inches of mercury)

3.73. Vm = sum of all ΔDGR for the test run (ft^3)

3.74. Vmstd = Vm corrected to standard conditions

3.75. w = 1/(1 - B), ratio of wet gas volume to dry gas volume

3.76. W = Wc + Wd (grams), amount of H_2O removed from the sampled gas

3.77. Wc = amount of water collected in the condenser or impingers (grams)

3.78. Wd = amount of water collected by the drying agent in the absorber (grams)

3.79. % = percent

~~3.80. WVAPCC = West Virginia Air Pollution Control Commission~~

~~§45-TP2-4.~~ Section 4. Adoption of Test Methods.

4.1. For determining compliance with the mass emission rates as delineated in ~~this Commission's Regulation 2~~45CSR2 - "To Prevent and Control Particulate Air Pollution From Combustion of Fuel in Indirect Heat Exchangers", a person shall utilize those Reference Methods, in particular Method 5, 5B, except as modified by subsection 4.1.a of this section, or 17, as contained in 40 CFR, Part 60, Appendix A [as of July 1, ~~1988~~1994] with the following amendments:

a. Primary filter media shall be maintained at, or about, stack temperature. The temperature of the primary filter media shall not exceed that of the stack except that in cases where sampling follows a wet scrubbing device the temperature of the primary filter, initial filter tare, and oven temperature may be adjusted to a maintained temperature of up to 250 °F.

b. The result of each compliance test is to be the arithmetic average of three (3) complete sampling runs conducted within a seven (7) day period.

c. A complete sampling run shall be one complete determination of the total particulate matter emission rate through the test stack for which:

A. the minimum total sampling time is two (2) hours; and

B. the minimum total sample volume is sixty (60) cubic feet adjusted to 68 °F and 29.92 inches of Hg. Smaller sampling volumes and shorter sampling times may be approved by the Director on a case-by-case basis when necessitated by process variables or other factors.

d. Any and all references in 40 CFR, Part 60, Appendix A, to the "Administrator" is amended to be the "Director".

In carrying out these methods for the purpose of determining mass emission rates, it is understood that other Reference Methods contained in 40 CFR, Part 60, Appendix A are integral parts of Methods 5, 5B, and 17 in particular, but not inclusive, Methods 1, 2, 3, and 4.

~~§45-TP2-5.~~ Section 5. **Unit Load and Fuel Quality Requirements.**

5.1. All compliance test runs, which are to be included in the test result for a unit or a specified number of units, shall be conducted while the unit or group of units is operated at or above the normal maximum operating load for the specified unit or group of units; while fuel or combinations of fuel representative of normal operation are being burned; and under such other relevant conditions as the Director may specify based on representative performance of the specified units.

~~§45-TP2-6.~~ Section 6. **Minor Exceptions.**

6.1. In the interest of practicality, the Director or his designee may allow minor exceptions, not related to test site safety, to the specifications of these methods, if the Director or his designee concludes that in a particular case, the granting of such exception would not invalidate the test results. If such exceptions are granted, alternate specifications may be prescribed.

6.2. If an exception as described above is granted, the scope of the exception and any alternative specification prescribed shall be recorded in a letter of exception signed by the authorizing official. A copy of such letter of exception shall be attached to the test report.

~~§45-TP2-7.~~Section 7. Pretest and Post Test General Requirements.

7.1. The owner/operator required to conduct tests and his test consultants shall become familiar with the requirements of ~~Regulation~~ 45CSR2 - "To Prevent and Control Particulate Air Pollution From Combustion of Fuel in Indirect Heat Exchangers", Reference Methods as contained in 40 CFR, Part 60, Appendix A, and the requirements as delineated in this ~~rule~~Appendix, including all forms, equations, and definitions. Questions of interpretation, applicability, or exception, shall be resolved with the Director or his designee prior to conducting the test.

7.2. When a compliance test conducted in accordance with this ~~rule~~Appendix is required, the owner or operator of the affected unit(s) shall be notified in writing by the Director or his designee. The notice shall prescribe the following:

a. the unit(s) to be tested;

b. the identification number to be assigned to the test;

c. the date by which the test is to be completed and the test report submitted; and

d. the person, if other than the Director, to whom the test report is to be submitted, and with whom questions concerning the test procedure may be resolved. Test report forms (see ~~Appendix~~Attachment) for filing the results of the compliance test are available from the ~~Commission~~Division of Environmental Protection on request.

7.3. At least thirty (30) days prior to each compliance test, a test protocol shall be furnished to the Director for his review and approval and shall include as a minimum, the following information:

a. Identification and description of the unit(s) that are to be tested.

b. A discussion of the manner in which the unit(s) shall be operated during the test periods with respect to operating loads, representativeness of fuel(s) fired, operating temperatures, and other factors which may affect emissions.

c. A description or listing of unit and control equipment data that shall be monitored and recorded during the test runs.

d. A description of test methods and equipment that shall be employed with requests for approval of any variances to test method procedures or sampling equipment designs set forth under ~~these rules~~this Appendix.

e. A drawing of the stack or duct sections where samples shall be taken showing distances to upstream and downstream gas flow disturbances or bends and changes in duct or stack cross sections.

f. A drawing of the test plane(s) showing dimensions and number and location of sampling (traverse) points.

g. The sampling time at each traverse point and total sampling time for each test run. If the sampling time per traverse point is to be less than five (5) minutes, comments shall be included concerning the variability of gas flow and temperatures during the shorter sampling time and how the sampling rate shall be monitored and adjusted to maintain isokinetic conditions.

h. The minimum volume (SCF) of gas that shall be sampled per test run.

i. The name of the person to contact concerning the scheduled tests and affiliation of personnel who shall conduct the tests.

j. A copy of the last individual stack registration approved by the Director in accordance with Sub-Section 34.1 (b) of ~~the Commission's Regulation~~ 45CSR2.

k. A statement concerning where the laboratory analyses are to be conducted and a description of the chain of custody for collected samples.

l. The anticipated date that subject testing is to be performed.

7.4. Notification of the actual dates upon which compliance testing will be conducted shall be provided to the Director, in writing, no later than fifteen (15) days prior to the date of the first test run so that he may, at his option, have an observer present during the test runs and sample analyses. Such notification may be submitted with the test protocol, however, the actual date of initial testing shall not be less than thirty (30) days from date of protocol submittal. Within constraints imposed by available facilities, copies of test field data sheets, laboratory sheets, unit operating logs and similar relevant data collected during the test runs shall be provided to the ~~WVAPGC~~West Virginia Division of Environmental Protection observer upon request at the conclusion of the tests. Any such data or other information so made available shall be treated as confidential upon request by the operator and shall not be made available to the public. The owner/operator shall place the word "confidential" upon all such information which is gathered and retained by the ~~WVAPGC~~West Virginia Division of Environmental Protection. If facilities and circumstances allow, the ~~WVAPGC~~West Virginia Division of Environmental Protection test observer shall, at his option, observe the laboratory analyses.

7.5. A compliance test report providing the information summarized below and any additional information that the Director may require shall be submitted to the Director within sixty (60) days of the completion of the compliance testing.

a. General Information

A. Plant name and location

B. Units/stacks tested

C. Name and address of company performing the tests

D. Test dates and times

b. Report Certification

The following persons shall certify that the test report contains true and accurate information:

A. Test team supervisor

B. Reviewer of test report (if applicable)

C. If test is performed by source owner, the report shall also be certified by facility owner/operator

c. Test Summary

A. Description of emissions sources/stacks tested

B. Purpose of test

C. Pollutants measured

D. Operating data

(a) Unit(s) configuration and air pollution control equipment flow diagrams.

(b) Summary of operating parameters including steam or electrical production rates and other relevant parameters measured and recorded and/or calculated for test periods shall be attached to the report.

(c) Pertinent control equipment and operating data recorded and/or calculated for the test period should be attached to the report. As each boiler operation and associated control equipment normally presents a unique case, pertinent data shall be determined on a case-by-case basis.

(d) Description of any unusual or non-typical operating mode, fuels, soot blowing, blowdown, etc. occurring or used during the tests.

d. Test Results

A. Mass emission test results with emissions reported in units of the applicable standard and in pounds per hour.

B. Visible emissions test results, if applicable, as measured by observer or transmissometer. If observed by personnel from test company or plant, evidence of observer's certification shall be attached to the report.

C. Description of collected samples (if such information is deemed to be useful).

D. Description and discussion of real or apparent errors involved in test or process measurements, analysis, etc.

e. Test Procedures

A. Description of test equipment including drawing of sampling train.

B. Description of test procedures employed with detailed documentation of any deviations from methods required by this ~~rule~~Appendix.

C. Description of analytical procedures employed with detailed documentation of any deviations from methods required by this ~~rule~~Appendix.

D. Dimensioned drawing of sampling port location showing distances to upstream and downstream gas flow disturbances.

E. Cross-sectional drawing of sampling plane showing location and numbers or other designations of sampling points.

f. Appendix

A. Copies of original field data sheets from test runs.

B. Copies of original log sheets, strip charts and other process or control equipment data recorded during tests. These attachments shall be certified by a responsible plant official. As each boiler operation and associated control equipment normally presents a unique case, pertinent data shall be determined on a case-by-case basis.

C. Laboratory report including chain of custody.

D. Description of test equipment calibration procedures and calibration results for test equipment used.

E. Description of calibration performed on devices recording important operating data during the tests.

F. Copies of strip charts or other original outputs from continuous emission monitoring (CEM) equipment on the tested source and description of CEM system calibration and operation prior to and/or during tests.

G. Originals of any visible emission readings taken during test period.

H. Copies of relevant correspondence such as ~~WVAPGC~~West Virginia Division of Environmental Protection letters approving test method variances.

I. Names and titles of persons involved in the test including sampling team members, company personnel, and outside observers.

7.6. Subject to the provisions of Section 6 of this ~~rule~~Appendix, Minor Exceptions, a complete sampling run is one complete determination of the total particulate matter emission rate through the test stack for which:

a. the composite particulate matter sample is extracted from the duct or stack at a location and from the number of sampling points prescribed in Method 1 of 40 CFR, Part 60, Appendix A [as of July 1, ~~1988~~1994];

b. the sampling equipment and its method of operation for collection of particulate sample meets the criteria and requirements prescribed in Method 5, 5B or Method 17 of 40 CFR, part 60, Appendix A [as of July 1, ~~1988~~1994];

c. the overall sampling rate is within ± 10% of the overall isokinetic sampling rate, as calculated in Method 5, 5B or Method 17 of 40 CFR, Part 60, Appendix A [as of July 1, ~~1988~~1994]; whichever is applicable;

d. the stack gas components data is determined as prescribed by Methods 3 and 4 of 40 CFR, Part 60, Appendix A, [as of July 1, ~~1988~~1994];

e. the other provisions of this ~~rule~~Appendix are met and sufficient heat input and fuel quality data is provided to verify that the requirements of ~~Sub~~Section ~~7.8. below~~8 are met; and

f. sufficient data and commentary is provided with the submitted test report forms to allow the Director or his designee to evaluate the reported test results and the conditions under which they were obtained.

~~§45-TP2-8.~~Section 8. Heat Input Data Measurements.

8.1. General.

a. The data measurements required to determine the total heat input to the fuel burning unit(s) vented by the test stack during the test run period depends on the computational method applicable.

This ~~rule~~Appendix prescribes three (3) computational methods:

Method 1H - Fuel Use Basis
Method 2H - Steam Balance Basis
Method 3H - Flue Gas Analysis Basis

The test supervisor is to submit data on the heat input(s) based on the Fuel Use Basis (Method 1H) whenever coal scales or other fuel meters, as appropriate, are available.

If the appropriate fuel metering device(s) are not available, Method 2H - Steam Balance Basis is to be used.

For all test runs also submit data on the heat input(s) based on Method 3H - Flue Gas Analysis Basis, in addition to the data required by Method 1H or 2H, whichever is applicable.

b. The following Sub-Sections detail the specific data required for each method and the means of obtaining these data.

8.2. Fuel Use Method (1H).

a. This computational method requires:

A. The measured amount of all fuel(s) fired in the fuel burning units during each test run period, as determined by continuous coal scales or equivalent and/or oil flow and/or gas meter(s). When gas is fired, the temperature and pressure of the gas meter(s) are needed.

B. The average moisture, ash, sulfur, volatile matter, and Btu value(s) of fuels fired in the fuel burning units during the test run period is to be determined and reported as follows:

(a) For coal:

(A) Obtain a representative sample of the coal fired in each fuel burning unit during the test run period. This sample is to be obtained in accordance with the Commercial Sampling Procedure of ASTM: Method D 2234-76 or its latest revision. Consult this ASTM standard for details of the required procedures. Sampling and analysis of coal entering bunkers or silos feeding the fuel burning unit to be tested is also acceptable provided that ASTM requirements are met and that such sampling/analysis properly represents the quality of the coal burned during the test periods.

(B) Prepare the reduced gross sample, obtained above, for laboratory analysis in accordance with ASTM: Method D 2013-72, "Preparing Coal Samples for Analysis" or its later revision. Consult this ASTM standard for details of the required procedure. In this ASTM method, further amplification is given to the methods of reducing the gross sample to a laboratory

sample and preparing the laboratory analysis. The laboratory sample is so prepared that 100% of the coal sample shall pass through a No. 60 (250 micron) sieve. The final product is thoroughly mixed prior to extracting analytical samples.

(C) Extract an analytical sample from the laboratory sample and determine the moisture, ash, and volatile matter content of this sample in accordance with ASTM Method D 3173-73 or ASTM Method D 2961-87 (Moisture), ASTM D 3174-82 (Ash), and ASTM D 3175-82 (Volatile Matter) or their latest revisions. Consult these ASTM standards for details of the required procedures. In these ASTM methods, procedures are prescribed for determining the moisture, ash, and volatile content of the sample.

(D) Extract another analytical sample from the laboratory sample and determine the Btu content of the sample in accordance with ASTM: Method D 2015-77 "Gross Calorific Value of Solid Fuel by the Adiabatic Bomb Calorimeter" or its latest revision. Consult this ASTM standard for details of the required procedure.

(E) Extract another analytical sample from the laboratory sample and determine total sulfur content of the sample in accordance with ASTM Method D 3177-75 "Test for Total Sulfur in the Analysis Sample of Coal and Coke" or ASTM Method D 4239-85 or their latest revisions. Consult these ASTM standards for details of the required procedures.

(F) Send a sealed and marked one pint sample of the laboratory sample representative of the gross sample, to the ~~Commission~~Director with the test report. If drying was used in reducing the gross sample to the laboratory sample, indicate the percent loss of moisture during this process. For each container provide the test identification number assigned by the ~~WVAPGC~~West Virginia Division of Environmental Protection in accordance with Sub-Section 7.2.b of this ~~rule~~Appendix and the test run number.

(b) For Fuel Oils:

Determine the supplier's name and address, and the specifications for the oil supplied. Use the supplier's specifications when available for the ash content and Btu value of the oil. When such specifications are not available, determine the grade of oil fired, by referring to any Standard Engineering Handbook. As such the Handbook and appropriate edition should be properly identified, for inclusion as part of any results submitted to the agency for the ash, sulfur and Btu values. Send an eight ounce, sealed and marked, sample of the oil fired during the test to the ~~Commission~~Director with the test report.

(c) For Natural Gas:

Determine the supplier's name and address, and the specification of the natural gas supplied. Use the supplier's specification for the Btu value of the fuel. Ash may be considered negligible.

(d) Other Fuels:

Determine the name and address of the supplier(s) or producer(s) of any other materials fired during the test run period. Determine the source(s) of the fuel(s). Use the supplier(s)'/producer(s)' specifications for the ash, sulfur, and Btu value. When such specifications are not available, resolve with the Director or his designee, the method which shall be used to determine these values, prior to conducting the test. Submit an appropriate small sample of the fuel fired, if other than a gas, to the ~~Commission~~Director in a sealed and marked sample container.

8.3. Steam Balance Method (2H).

This method requires a materials balance and inlet and outlet water/steam or other media pressure and temperature data during the test run period, for the boiler(s) of the fuel burning unit(s) vented by the test stack.

a. Measure the mass flow rate of all water/steam or other media flowing through each boiler, including blowdown.

b. Measure the inlet and outlet pressure and temperature of each water/steam circuit, including blowdown.

c. Construct a flow diagram of the water/steam or other media flow circuit(s) on Form THI-II (2H). Record the measured data on this form, indicating the data points on the diagram.

d. Determine the boiler manufacturer's name and address, and the boiler type and model number. From the manufacturer's specification, determine the boiler(s) thermal efficiencies. If such specifications are not available, describe in detail the basis and method of selecting the value used.

8.4. Flue Gas Analysis Method (3H).

a. This method involves determining the heat input for the boiler(s) of the fuel burning unit(s) vented by the test stack utilizing:

A. appropriate F-factors as contained in 40 CFR, Part 60, Subpart D [as of July 1, ~~1988~~1994]; and

B. total volume of stack gas discharged through the stack during the test run; and

C. the average excess air discharged [O_2% or CO_2%] through the test stack during the test run period.

b. Appropriate F-factors are to be obtained from 40 CFR, Part 60, Subpart D [as of July 1, ~~1988~~1994], unless carbon content of fly ash or bottom ash exceeds five (5) percent on a per weight basis. In these cases, consult the Director

or his designee prior to conducting the test to determine and resolve a suitable F-factor adjustment.

c. Total Volume of Stack Gas.

The total volume of stack gas is determined from:

A. volume meter readings obtained during subject test run and recorded on Form TD: Test Run Data Sheet for each test run.

d. Stack Excess Air.

A. For low nitrogen content fuel(s) (coal, fuel oil, natural gas), the stack excess air can be computed from the data obtained from the Orsat analysis and recorded on Form TOA - Laboratory Data Sheet (Orsat) for each test run. If blast furnace gas, producer gas, or other fuel(s) of high nitrogen content are used, consult the Director or his designee prior to conducting the test to determine and resolve a suitable method of determining the excess air when such fuel(s) is burned.

~~§45-TP2-9.~~ Section 9. **Computations and Data Analysis.**

This section prescribes the computational method to be used in computing the particulate matter stack emission rate for the test and evaluating the supporting test data. Perform the computations and analysis prescribed in this section for the data obtained from each test run which is to be part of the submitted test results. Record the measured data and the appropriate computations on the designated test report forms, a copy of which is in the Appendix. Submit sufficient commentary with the test report data to fully describe the conditions under which the data was obtained and any factors which might affect the evaluation of the test results.

9.1. Particulate Matter Sample Weight Determination. (Form TLP - Laboratory Data Sheet (Particulate)).

Mf = particulate matter (grams) collected by the primary filter, including andy prefilter if used

Ma = particulate matter (grams) obtained from the evaporation of the acetone washings of the internal sampling train surfaces exposed to the particulate sample prior to the primary filter

Ab = particulate matter residue (grams) in the volume (Va) of acetone wash used for Ma above, as determined by the acetone blank analysis [i.e., Ab = (Sd) (Va); where Sd equals the residue found in the acetone blank analysis in gm/ml, and Va equals the volume of acetone used in the acetone wash for Ma above]

Mn = Mf + Ma - Ab = the indicated weight of particulate matter collected, in grams

9.2. Moisture Determination. (Form TLH: Laboratory Data Sheet - Moisture; Forms TD; Test Run Data Sheet).

Record all measured and calculated data on the appropriate forms. Compute and record the following:

Vm = (ft^3) the sum of all ΔDGR for the run, where ΔDGR is equal to the indicated amount of gas sampled at each point during the extraction interval

Tm = (°F) average temperature of the dry gas meter during the test run. Tm = average dry gas meter temperatures (°F) at each sampling point.

Pm = (in. Hg) average absolute pressure at the dry gas meter during the test run. Pm = the average absolute pressure at the dry gas meter for each sample point, where Pm = Pb - Vac; Pb = barometric pressure, Vac = meter vacuum.

Wc = amount of water collected in condenser or impingers (grams)

Wd = amount of water collected by the drying agent used after the condenser or impingers (grams)

W = Wc + Wd (grams)

B = percent moisture in the sampled gas by volume on a wet basis, divided by 100

$$B = W/\left(\frac{374\ Pm\ Vm}{Tm + 460} + W\right)$$

w = moisture correction factor; ratio of the volume of wet sample gas to the volume of dry sample gas

$$w = 1/(1 - B)$$

9.3. Sample Gas Density and Excess Air Determination. (Form TOA - Laboratory Data Sheet (Orsat)).

a. Gas Density.

A. Record the Orsat analysis for all three runs on Form TOA (Laboratory Data Sheet) on lines 1 through 9. Compute and record the average value of CO_2, O_2, CO and N_2 for each run on line 10 or the value of these components of the composite sample, if obtained (optional), on line 11.

B. Transcribe the values of w (moisture correction factor) from Form TLH to Form TOA in blocks 12 for each run. Transcribe the values of B, the percent water (wet basis) from Form TLH to Form TOA in column 13, line 14, for each run.

C. Correct the average component volumetric percentages, dry basis (line 10), to volumetric fractions (wet basis), by dividing by 100w and enter these values on line 14 for each test run.

D. Multiply each of these volumetric fractions (wet basis - line 14) by the corresponding molecular weights on line 15 and enter the values on line 16.

E. Enter the sum of the values on line 16 for each run in the appropriate box on line 17, the apparent molecular weight of the wet gas (Mg).

F. Determine the wet gas density for each run by dividing the molecular weight for the run (on line 17) by the number 29 and enter this quotient in the appropriate box on line 18.

b. Excess Air.

Compute and record the excess air fraction for each run using the average dry gas analysis from line 10 and the formula shown on line 20. Record excess air fraction (EA) in the appropriate box on line 19.

Note: The excess air fraction equation present on line 20 of Form TOA is not applicable when producer gas, blast furnace gas or other fuels high in nitrogen content are used.

9.4. Actual Sample Gas Volume Determination. (Form TD: Test Run Data Sheet).

a. For each point sampled during the run compute the actual volume drown through the sampling nozzle adjusted to standard conditions of 68 °F and 29.92 inches of Hg as indicated below:

qm = Actual sample volume (in cubic feet) drawn through the sampling nozzle for each sampled point adjusted to 68 °F and 29.92 inches of Hg.

$$qm = \frac{(\Delta DGR)\,(w)}{\frac{Pm}{29.92}} \cdot \frac{528}{(Tm + 460)} \cdot$$

WHERE,

ΔDGR, w, Tm, and Pm are defined in Sub-Section 9.2 of this Section and are recorded on Form TD.

b. Record the computed values of qm for each sampled point on the appropriate line of the column labeled qm on Form TD. Sum the values of qm for all points included in the run and enter this value (Qm) in the block so labeled.

9.5. Isokinetic Sample Volume Determination. (Form TD: Test Run Data Sheet).

a. For each point samples during the run, compute the volume of sample gas (adjusted to 68 °F and 29.92 inches of Hg) that would have been drawn through the sampling nozzle if isokinetic conditions were maintained, as indicated below:

qo = Isokinetic sample volume, the volume of sampled gas (in cubic feet) for each sampled point, if isokinetic conditions were maintained, adjusted to standard conditions of 68 °F and 29.92 inches of Hg. For conditions where static pressure in the duct or stack being tested is more than 20 in. H_2O, consult with Director or his designee.

$$qo = \frac{60\ (528)\ (Fp)\ (An)}{\Delta t} \cdot \left(\frac{\Delta H}{Ts + 460}\right)^{.5} \cdot$$

WHERE,

Fp = combined correction factor for units and Pitot tube deviation:

Standard tube = 2.90 (units) x 1.00 (deviation) = 2.90

Type S tube = 2.90 (units) x 0.83*(deviation) = 2.41

*Note: The deviation for the Type S tube may vary for different sampling configurations and should be determined by calibration against a standard pitot tube for each Pitobe arrangement per Method 2 of 40 CFR, Part 60, Appendix A [as of July 1, ~~1988~~1994].

An = the cross-sectional area of the sampling nozzle in (ft^2)

ΔH = Pitot tube differential reading** in inches of H_2

**Note: If the particular pitot tube differential indicator used is calibrated to give a reading of the square root of ΔH ($\sqrt{\Delta H}$), change the heading of the "ΔH" column on Form TD to $\sqrt{\Delta H}$ and modify your computations for qo as appropriate.

Ts = Average stack gas temperature (in °F) at each sampled point during the extraction time at that point.

Δt = elapsed time at each sampling point (minutes)

b. Record the computed values of qo for each sampled point on the appropriate line of the column labeled qo on Form TD. Sum the values of qo for all points included in the run and enter this value (Qo) in the block so designated.

9.6. Fractional Isokinetic Rate Determination. (Form TD: Test Run Data Sheet).

a. For each point sampled during the run, compute the point isokinetic factor (ISKp), which indicates the average degree of deviation from isokinetic conditions during the sampling (extraction) time at that point. ISKp is computed as follows:

ISKp = the point isokinetic factor, the ratio of the actual sample volume to the isokinetic sample volume, both volumes adjusted to standard conditions of 68 °F and 29.92 inches of Hg

$$ISKp = \frac{qm}{qo}$$

WHERE,

qm is defined in Sub-Section 9.4 and qo is defined in Sub-Section 9.5 of this ~~rule~~Appendix, both values are recorded for each point on Form TD.

b. Record the computed value of ISKp for each sampled point on the appropriate line of the column labeled ISKp on Form TD. The value of ISKp for each sampled point should not vary greatly from the overall isokinetic factor (ISKo).

c. For each run, compute the overall isokinetic factor (ISKo), which indicates the overall degree of deviation from isokinetic conditions during the run, and which is used in the weight emission rate computations of the next section. ISKo is computed as follows:

ISKo = the overall isokinetic factor, the ratio of the total actual sample volume to the total isokinetic sample volume, both volumes adjusted to standard conditions of 68 °F and 29.92 inches of Hg.

$$ISKo = \frac{Qm}{Qo}$$

WHERE,

Qm is defined in Sub-Section 9.4 and Qo is defined in Sub-Section 9.5 of this ~~rule~~Appendix, both values are recorded for each run on Form TD.

d. Record the computed value of ISKo for each run in the block so designated on Form TD. If the value of ISKo is outside the range of 0.9 to 1.10, reject the run result.

e. Compute the value %ISK as follows: retain the sign and record on Form TR-II: Summary of Test Run Results.

$$\%ISK = 100 \quad ISKo - 1$$

9.7. Particulate Matter Emission Rate Determination. (Form TD: Test Run Data Sheet, Form TR-II: Summary of Test Run Results).

The particulate matter emission rate for each run is computed from the following equation:

$$M(P)n = \frac{Mn}{C} \cdot \frac{As}{An} \cdot \frac{60}{\Theta} \cdot \frac{1}{ISKo}$$

WHERE,

M(P)n = the particulate matter emission rate (in pounds per hour) for the test run

Mn = Mf + Ma - Ab indicated weight of particulate matter (in grams) collected by the sampling train.

C = 453.592 grams/pound

As = the cross-sectional area of the sampling plane (ft^2)

An = the cross-sectional area of the sampling nozzle (ft^2)

60 = 60 minutes per hour

Θ = the sum of all extraction times at all points sampled per run (the sum of Δt's). The total sampling time, not including movement time from port to port.

ISKo = Qm/Qo = the overall isokinetic factor for the run. The ratio of total actual volume sampled to the total isokinetic volume, both values adjusted to 68 °F and 29.92 inches of Hg on a wet basis.

The values of Mn, As, An, Θ and ISKo for each run are recorded on Form TD: Test Run Data Sheet.

Record the value of M(P)n for each test run on Form TR-II: Summary of Test Run Results.

9.8. If more than one sampling plane was required to evaluate the total stack emission rate, perform the computation specified in 9.7 of this ~~rule~~Appendix for each sampling plane, then sum the values of M(P)n for all sampling planes used. Record the total emission rate for each run (all sampling planes) on Form TR-II as above, then compute the average stack emission rate for the test. Note the number and designations of the sampling planes used under comments. If more than one sampling train was used simultaneously to sample the required number of sampling points at one sampling plane, the values of Mn, Qm, and Qo are the sum total values for all the sampling trains used for the one sampling plane.

9.9. Heat Input Determinations. (Forms THI-II: Heat Input Data Sheets: Form TOA; Laboratory Data Sheet (Orsat); Form TR-II: Summary of Test Run Results).

a. This Sub-Section prescribes three (3) methods of computing the total heat input to the (similar) fuel burning unit(s) vented by the test stack:

Method 1H	-	Fuel Use Basis
Method 2H	-	Steam Balance Basis
Method 3H	-	Flue Gas Analysis Basis

Submit data and computations on the appropriate forms.

b. Summarize the results of the selected computational methods on From TR-II: Summary of Test Run Results for each run. Record the type units tested (see definitions for type), the total number of similar units associated with the test run results, the two values of the total heat input for all the units associated with the test run results, as computed by the two selected methods, the total design heat input and the total maximum normal operating load for the units associated with the test result (see definitions for the heat input terms).

9.10. Method 1H - Fuel Use Basis.

a. From the data obtained in accordance with Sub-Section 8.2, Heat Input Data Measurements, compute the heat input for each fuel burning unit for which this method is to be used, as follows:

$$HI = \frac{60}{\Theta} \sum_{i=1}^{n} \frac{(Fi \times HVi)}{10^6}$$

WHERE,

HI = Heat input per fuel burning unit(s) in 10^6 Btu per hour

Fi = The quantity of each fuel fired in this fuel burning unit during the total test run period (Θ) in appropriate dimension units (e.g., pounds, gallons, SMCF)

HVi = The average Btu value of each fuel used, in appropriate dimensional units related to the Fi units (e.g., Btu/lb, Btu/gal, Btu/SMCF), on an as fired basis

Θ = The total test run period in minutes. The sum of all extraction intervals (Δt)

n = The number of different fuels fired in the fuel burning unit during the test run period

NOTE = When more than one fuel burning unit is vented by the test stack, sum the individual heat input values for all units of the same type vented by the test stack to obtain the total heat input for the test.

b. Record the values used in the computations, and the results on Form THI-II (1H)

9.11. Method 2H - Steam Balance Basis.

a. From the data obtained in accordance with Sub-Section 8.3 of this ~~rule~~Appendix, compute the heat input for each fuel burning unit for which this method is to be used, as follows:

$$HI = \frac{mf\ (ho - hi) + Mbd\ (hbd)}{10^* (BE)}$$

WHERE,

HI = Heat input per fuel burning unit in 10^6 Btu per hour

ho = Average enthalpy of steam/water or other media leaving the boiler of the fuel burning unit in Btu/lbm

hi = Average enthalpy of steam/water or other media entering the boiler of the fuel burning unit in Btu/lb

mf = Average mass flow rate of steam/water or other media through the boiler in lbm/hour

Mbd = Average mass flow rate of blowdown in lbm/hour

hbd = Average enthalpy of steam/water or other media leaving the boiler as blowdown in Btu/lbm

BE = The boiler thermal efficiency (percent)

NOTE: The enthalpy values for the above equation can be determined from the inlet and outlet temperatures and pressures of the steam/water or other media flowing through the boiler using appropriate steam tables.

b. Record the steam flow, temperatures, pressures, and enthalpy values on the steam/water or other media circuit flow diagram required on Form THI-II (2H). Also record the necessary calculations and results on Form THI-II (2H) or attached sheet(s). Sum the heat input values of all fuel burning units of the same type vented by the test stack.

9.12. Method 3H - Flue Gas Analysis Basis:

a. From data obtained in accordance with Sub-Section 8.4 of this ~~rule~~Appendix, compute the heat input for each fuel burning unit for which this method is to be used, as follows:

$$HI = Vmstd \cdot \frac{As}{An} \cdot \frac{20.9 - \%O_2}{20.9} \Big/ F\text{-factor} \cdot \frac{\Theta}{60}$$

WHERE,

HI = Heat input per fuel burning unit in 10^6 Btu per hour

Vmstd = Volume of gas sample measured by the dry gas meter during run corrected to standard conditions of 68 °F and 29.92 inches Hg.

As = Cross-sectional area of the sampling plane (ft^2)

An = Cross-sectional area of the sampling nozzle (ft^2)

$\%O_2$ = Percent oxygen content by volume as taken from Orsat analysis on Form TOA

F-factor = a factor representing a ration of the dry flue gases generated to the calorific value of the fuel combusted (dscf/10^5 Btu), See 40 CFR, Part 60, Subpart D

Θ = Sum of all extraction time at all points sampled per run (minutes)

b. Record Vmstd, $\%O_2$, F-factor, and Θ on Form THI-II (3H). Record calculations.

~~§45-TP2-10.-------Inconsisteney-Between-Regulations.~~

~~10.1. In the event of any inconsisteney between this regulation and any other regulation of the Commission, such inconsistency shall be resolved by the determination of the Director and such determination shall be based upon the application of the more stringent provision, term, condition, method, rule or regulation.~~

BUREAU OF ENVIRONMENT
10 McJUNKIN ROAD
NITRO, WV 25143-2506

GASTON CAPERTON
GOVERNOR

DAVID C. CALLAGHAN
COMMISSIONER

April 26, 1995

Ms. Judy Cooper
Director, Administrative Law Division
Secretary of State's Office
Building 1, Suite 157K
Charleston, West Virginia 25305

RE: 45 CSR 2 - Prevention and Control of Particulate Air Pollution From Combustion of Fuel in Indirect Heat Exchangers

Dear Ms. Cooper:

This is to advise you that I am giving approval for the filing of the above-captioned rule as a final filing and adoption of a legislative rule authorized by the West Virginia Legislature.

Your cooperation in this regard is very much appreciated. If you have any questions or require additional information, please feel free to contact Roger T. Hall at 759-0515.

Sincerely yours,

David C. Callaghan
Commissioner
Bureau of Environment

DCC;RTH:cc

Attachment

KEN HECHLER
Secretary of State

MARY P. RATLIFF
Deputy Secretary of State

A. RENEE COE
Deputy Secretary of State

CATHERINE FREROTTE
Executive Assistant

Telephone: (304) 558-6000
Corporations: (304) 558-8000

STATE OF WEST VIRGINIA

SECRETARY OF STATE
Building 1, Suite 157-K
1900 Kanawha Blvd., East
Charleston, WV 25305-0770

WILLIAM H. HARRINGTON
Chief of Staff

JUDY COOPER
Director, Administrative Law

DONALD R. WILKES
Director, Corporations

(Plus all the volunteer help we can get)

FAX: (304) 558-0900

March 29, 1995

Tammy Mowrer
DEP-Air Quality
1558 Washington St. E.
Charleston, WV 25311

HB 2134 authorizing, **Title 45, Series 2,** **To prevent and control particulate air pollution from combustion of fuel in indirect heat exchangers**, passed the Legislature on **March 10, 1995.** It is was signed by the Governor on March 24, 1995.

You have sixty (60) days after the Governor signs HB 2134, to final file the legislative rule with the Secretary of State's office. To final file your legislative rule, fill in the blanks on the enclosed form #6, the "Final Filing" form and file the form with our office with a promulgation history of the rule. Authorization for your legislative rule is cited in **HB 2134** section **64-3-1(s).** The agency may set the effective date of the legislative rule up to ninety (90) days from the date the legislative rule is final filed with the Secretary of State's office. Please have an authorized signature on the bottom line.

***IMPORTANT: YOUR AGENCY MUST SUBMIT A CLEAN COPY OF THE LEGISLATIVE RULE ON DISK, WITH ALL UNDERLINING, STRIKE-THROUGHS AND HEADERS/FOOTERS TAKEN OUT, TO OUR OFFICE WHEN FINAL FILING THE RULE. THE DISK MUST BE ON A WORD PERFECT (5.1 OR 5.2 VERSION) OR WORD PERFECT COMPATIBLE COMPUTER SYSTEM 3 1/2" DOUBLE DENSITY DISK. STATE ON THE DISK THE FORMAT THE RULE IS IN AND THE TITLE IT IS FILED UNDER. THIS WILL ENABLE US TO ENTER YOUR RULES ON THE LEGISLATIVE DATA BASE. REMEMBER THE TEXT OF THE COMPUTER FILED RULE MUST BE IDENTICAL - WORD FOR WORD, COMMA FOR COMMA, WITH ALL UNDERLINING, STRIKE-THROUGHS AND HEADERS/FOOTERS TAKEN OUT, AS THE HARD COPY AUTHORIZED BY THE LEGISLATURE.**

After the final rule is entered into the legislative data base, the rule will be sent to the agency for review and proofing. Following confirmation or corrections, as the case may be, the Secretary of State shall submit to the agency a final version of the rule for their records.

If you have any questions or need any assistance, please do not hesitate to call our office.

Thank You
Administrative Law Division

KEN HECHLER
Secretary of State

MARY P. RATLIFF
Deputy Secretary of State

STEPHEN N. REED
Deputy Secretary of State

CATHERINE FREROTTE
Executive Assistant

Telephone: (304) 558-6000
Corporations: (304) 558-8000
FAX: (304) 558-0900

STATE OF WEST VIRGINIA
SECRETARY OF STATE

Building 1, Suite 157-K
1900 Kanawha Blvd., East
Charleston, WV 25305-0770

WILLIAM H. HARRINGTON
Chief of Staff

JUDY COOPER
Director, Administrative Law

PENNEY BARKER
Supervisor, Corporations

(Plus all the volunteer help we can get)

TO: Tammy Mowrer

AGENCY: DEP - Air Qualtiy

FROM: JUDY COOPER, DIRECTOR, ADMINISTRATIVE LAW DIVISION

DATE: April 1, 1996

THE ATTACHED RULE FILED BY YOUR AGENCY HAS BEEN ENTERED INTO OUR COMPUTER SYSTEM. PLEASE REVIEW, PROOF AND RETURN IT WITH ANY CORRECTIONS. IF THERE ARE NO CORRECTIONS, PLEASE SIGN THIS MEMO AND RETURN IT TO THIS OFFICE. YOU WILL BE SENT A FINAL VERSION OF THE RULE FOR YOUR RECORDS.

PLEASE RETURN EITHER THE CORRECTED RULE OR THIS FORM WITHIN TEN (10) WORKING DAYS OF THE DATE YOU RECEIVED THIS REQUEST. CALL IF YOU HAVE ANY QUESTIONS.

SERIES: 2 TITLE: 45 DEP - Air Qualtiy

* THE ATTACHED RULE HAS BEEN REVIEWED AND IS CORRECT.

SIGNED: _____

TITLE OF PERSON SIGNING: _____

DATE: _____

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* THE ATTACHED RULE HAS BEEN REVIEWED AND NEEDS CORRECTING. THE CORRECTIONS HAVE BEEN MARKED.

SIGNED: Tamra S. Mowrer

TITLE OF PERSON SIGNING: Administrative Secretary

DATE: October 18, 1996

NOTE: IF YOU ARE NOT THE PERSON WHO HANDLES THIS RULE, PLEASE FORWARD TO THE CORRECT PERSON.

Sorry for the long delay!