

**AIR POLLUTION CONTROL REGULATION NO. 20**  
**BURNING OF ALTERNATIVE FUELS**

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**RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
DIVISION OF AIR RESOURCES**

**AIR POLLUTION CONTROL REGULATION 20**

**BURNING OF ALTERNATIVE FUELS**

20. Burning of Alternative Fuels

20.1 Definitions

- 20.1.1 "Aerodynamic downwash" means the rapid descent of a plume to ground level with little dilution and dispersion due to alteration of background air flow characteristics caused by the presence of buildings or other obstacles in the vicinity of the emission point.
- 20.1.2 "Alternative fuel" means any materials, other than fuel oil, natural gas, coal or wood residue that is burned for the purpose of creating useful heat. Types of alternative fuels include, but are not limited to waste oil and hazardous waste. This definition does not include refuse derived fuel (RDF).
- 20.1.3 "Fuel burning equipment" means any furnace, boiler, apparatus, stack and all appurtenances thereto used in the process of burning fuel for the primary purpose of producing heat or power.
- 20.1.4 "Fuel oil" means any virgin distillate oil, virgin residual oil or a blend of these.
- 20.1.5 "Hazardous waste" means any waste or combination of wastes of a solid, liquid, gaseous or semi-solid form which is defined as a hazardous waste in the Rhode Island Rules and Regulations for Hazardous Waste, Generation, Transportation, Treatment, Storage and Disposal.
- 20.1.6 "Waste oil" means used or spent oil of any kind, including but not limited to those oils from automotive, industrial, aviation and other source categories.
- 20.1.7 "Wood residue" means a waste by-product of the pulp and paper industry which consists of bark, sawdust, slabs, chips, shavings and mill trim.

## 20.2 Applicability

The provisions of this regulation shall apply to any person burning alternative fuels in fuel burning equipment with a heat input capacity of one million Btu per hour or greater.

## 20.3 Prohibitions

No person shall burn alternative fuels without first obtaining written approval from the Director.

## 20.4 Approval to Burn Alternative Fuels

### 20.4.1 Alternative Fuels Containing PCB's

Approval to burn alternative fuels containing PCB's shall be granted consistent with the requirements of Title 40 of the Code of Federal Regulations Part 761 entitled "Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions" and the Rhode Island Rules and Regulations for Hazardous Waste Generation, Transportation, Treatment, Storage and Disposal.

### 20.4.2 Alternative Fuels Containing Less than 50 ppmv PCB's

- (a) For consideration as an alternative fuel, a material must meet the following standards:

Heating Value	8,000 Btu/lb or greater
Halogens	0.1% by weight or less
Lead	100 ppm by weight or less
Sulfur	1.0% by weight or less
PCB	50 ppm by volume or less
Flashpoint	100°F minimum
Arsenic	5 ppm by volume or less
Cadmium	2 ppm by volume or less
Chromium	10 ppm by volume or less

- (b) Any person seeking permission to burn alternative fuels must provide the Director with:

- (1) A laboratory analysis of the material for the properties or constituents listed in Subsection 20.4.2 (a), heavy metals, flash point, viscosity, bottom solids and water, and ash, and any other hazardous components suspected of being in the material; and
- (2) Identification of the process that generates the alternative fuel, the maximum feed rate of the alternative fuel and the maximum percent

of the total fuel feed rate that is alternative fuel.

- (c) Any facility permitted to burn alternative fuels must have a full-time operator in attendance who is knowledgeable in the operation of the fuel burning equipment used for burning the alternative fuels.

## 20.5 Limitation on Air Contaminants

20.5.1 Any person burning alternative fuels must be in compliance with all applicable rules and regulations of the Division of Air and Hazardous Materials or subject to the requirements of an enforceable compliance schedule.

20.5.2 No person shall at any time cause or permit the emission of air contaminants from the burning of alternative fuels that will:

- (a) cause or contribute to a violation of any state or national ambient air quality standard; or
- (b) by reason of their concentration or duration may be injurious to human, plant or animal life; or
- (c) unreasonably interfere with enjoyment of life or property or cause damage to property.
- (d) cause an increase in ground level concentrations of a listed toxic air contaminant, at or beyond the property line of that facility, in excess of the Acceptable Ambient Levels, delineated in the Division of Air Resources Regulation No. 22 entitled, "Air Toxics."

20.5.3 The Department may set standards for the properties of alternative fuels more stringent than those listed in Subsection 20.4.2 (a) as may be necessary to prevent air pollution where it is determined that an aerodynamic downwash problem exists at a source.

## 20.6 Sampling and Analysis of Alternative Fuels

20.6.1 To ensure that the alternative fuel meets the specifications of Section 20.4 of this regulation, the source approved to burn alternative fuels shall sample and analyze alternative fuels for the applicable standards, along with the flash point, viscosity, bottom solids and water, and ash content, according to a schedule approved by the Division of Air Resources. Appendix B of this regulation may be used as a guideline for developing an approvable schedule.

20.6.2 All analyses performed for the fulfillment of any requirements of this regulation shall be according to those methods specified in Appendix A of this regulation

where applicable. Alternative methods may be used providing they have the prior approval of the Director. Where test methods are not specified, the analyst should consult with the Director on the methods proposed to be used.

## 20.7 Trial Burns and Emission Testing

20.7.1 The Director may require a trial burn for each alternative fuel that is significantly different in physical or chemical characteristics from any alternative fuel previously demonstrated to have been burned successfully under equivalent conditions. Such testing shall be conducted to determine the level of emission of air contaminants from the burning of alternative fuels.

20.7.2 The above required emission testing shall be conducted at the expense of the owner or operator of the source according to methods that have the prior approval of the Director.

20.7.3 The above required emission testing shall include the following minimum determinations:

- (a) An analysis of the exhaust gases for concentrations of carbon monoxide, carbon dioxide, oxygen, particulates, hydrogen halides (if applicable) and any principal hazardous components identified by the Director:
- (b) A measurement of combustion temperature
- (c) A computation of destruction efficiency for each principal hazardous component identified by the Director, where

$$\text{Destruction efficiency} = \frac{W_{\text{In}} - W_{\text{out}}}{W_{\text{in}}} \times 100$$

$W_{\text{in}}$  = mass feed rate of principal hazardous components of alternative fuel going into fuel burning equipment

$W_{\text{out}}$  = mass emissions rate of principal hazardous components in alternative fuel

## 20.8 Alternative Standards and Schedules

The Director may approve alternative standards to those listed in Subsection 20.4.2(a) of this regulation provided that the applicant can demonstrate to the Director's satisfaction that the emissions resulting from the burning of alternative fuels not meeting the requirements of Subsection 20.4.2 (a) either alone or in combination with other emissions, by reason of their concentration and duration in the outdoor atmosphere, will not be injurious to human, plant or animal life or cause damage to property, or cause to contribute to a violation of the standards in Section 20.5.2 of the regulation.

## 20.9 Record Keeping

20.9.1 The owner or operator of a source burning alternative fuels shall maintain records for a period of three (3) years that include:

- (a) The feed rate of alternative fuels;
- (b) The total fuel feed rate;
- (c) The date and hour deliveries or additions to the fuel storage tanks are made and the quantity;
- (d) The date and hour samples required by Section 20.6 are taken;
- (e) The time that burning of the alternative fuel commenced and ceased, or was interrupted, including the date and hour;
- (f) The name and address of the supplier of the alternative fuel.

20.9.2 Sources or suppliers required to have analyses performed pursuant to Section 20.6 of this regulation shall forward results of these analyses to the Division of Air Resources within ten (10) working days of required sampling.

20.9.3 Sources receiving exemptions under Section 20.10 may be required to maintain records of the alternative fuel burned at their facility. The nature of this record keeping shall be determined when approval is granted to burn the alternative fuel.

## 20.10 Exemptions

The provisions of this regulation, except for Subsection 20.9.3, insofar as they relate to air pollution, shall not apply to any person who blends alternative fuels with their primary fossil fuel where the maximum amount of alternative fuel as a percent by volume of the primary fossil fuel is less than or equal to one. This exemption shall not apply to alternative fuels containing greater than 50 ppm PCB's nor does it exempt any person from compliance with the Department's Hazardous Waste Rules and Regulations. Exemptions under this

section will be considered after a written request to the Department from the applicant that explains the nature of the alternative fuel that is requested to be burned.

#### 20.11 Alternative Fuels Sellers

Any person selling alternative fuels must retain for a period of three (3) years records of each sale, including gallons sold, the date of delivery and the person who receives the alternative fuel for burning, and shall make these records available to the Department for inspection upon request.

#### 20.12 Compliance with Hazardous Waste Regulations

Compliance with this regulation does not relieve any person from compliance with the Department's Hazardous Waste Rules and Regulations.

**APPENDIX A**  
**WASTE OIL/SOLVENT BURNING REGULATION**  
**RECOMMENDED TEST PROCEDURES**

Heavy Metals

U.S. EPA test method SW-846, November 1986, 3rd edition "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods."

Flash Point

ASTM Test Method D 93-77 "Flash Point by Pensky Martens Closed Tester."

Viscosity

ASTM Test Method D 445-74 "Kinematic Viscosity of Transparent and Opaque Liquids (and the Calculation of Dynamic Viscosity)" with the modification that for oils which give evidence (increased viscosity with time outside repeatability limits, low flash point) of contamination by volatiles; a notation should be in the test report that repeatability was not obtained and list the viscosity values in sequence.

Heating Value

ASTM Test Method D 240-76 "Heat of Combustion of Hydrocarbon Fuels by Bomb Calorimeter" with the modification that the alternative fuel sample be vigorously agitated immediately prior to taking the test sample so that all particulate material be in complete suspension.

BS & W

ASTM Test Method D 95-70 "Water in Petroleum Products and Bituminous Materials by Distillation" with the modification that the sample volume taken for analysis be reported.

ASTM Test Method D 473-69 "Sediment in Crude and Fuel Oils by Extraction" with the modification that a new refractory thimble be used for each determination. Note: Value should be reported either as a combined value for water and sediment on a weight basis or reported separately.

Ash

ASTM Test Method D 874-77 "Sulfated Ash from Lubricating Oils and Additives" with the modification that platinum crucibles should not be used.



## Total Sulfur

ASTM Test Method D 1552 "Sulfur in Petroleum Products (High Temperature Method)."

## Lead

ASTM Test Method D 2788-72 "Trace Metals in Gas Turbine Fuels (Atomic Absorption Method)" with the modification described in NBS Technical Note 1130 "Recycled Oil Program" Phase 1 - Test Procedures for Recycled Oil Used as a Burner Fuel."

### Modified D 2788-72 Test Procedure

Prepare lead metallo-organic standard as described on NBS-SRM 1059b Certificate of Analysis; however, methyl isobutyl ketone (MIBK) is substituted for the light oil in the dissolution procedure.

Place sample in a vigorous paint shaker and agitate for 20 minutes. Transfer 1 g test portions to a tared 50 mL beaker. Re-weigh beaker and transfer test portion of 100mL volumetric flask using methyl isobutyl ketone (MIBK). Add 5 mL of a 1 percent succinimide dispersing agent and dilute to calibrated volume with MIBK. Just prior to the sampling of the test portion for the standard addition, place the volumetric flask in an ultrasonic bath and agitate the sample for 10 minutes. Then transfer immediately four aliquots of the test portion to volumetric flasks. (Note: the optimum concentration of lead for flame AAS is 5 to 10 ug/mL. If the final lead concentration including the standard addition exceeds 20 ug/mL, a non-linear curve is obtained which has a tendency to produce high analytical values.) With a volumetric pipet, transfer known concentrations of the lead metallo-organic standard solution to three of the volumetric flasks and dilute to a calibrated volume with MIBK.

Turn on the AAS instrument and insert a lead hollow cathode lamp. Adjust the lamp current to the recommended value and set the wave length to 283.3 nm using a spectral bandpass of 0.7 nm. Allow the hollow cathode lamp to warm up for 15 minutes. Insert a 10 cm single slot burner head on the burner. Turn on the air-acetylene flame and adjust the nebulizer to a flow rate of 2 to 3 mL/min. Then while nebulizing MIBK, adjust the acetylene flow rate to obtain a lean flame. Nebulize the unknown solutions and obtain a net absorbance for each solution. Always nebulize MIBK before and after taking a measurement. Repeat the measurements three times and then determine the concentration in the unknown sample by extrapolation.

## Halogens

ASTM Test Method D 808-63 "Chlorine in New and Used Petroleum Products (Bomb Method)."

ASTM Test Method D 1317-64 "Chlorine in New and Used Lubricants (Sodium Alcoholate Method)."

## Nitrogen

ASTM Test Method E 258-67 "Standard Test Method for Total Nitrogen Inorganic Material by Modified KJELDAHL Method."

## APPENDIX B

### GUIDELINES FOR APPROVABLE SAMPLING AND ANALYSIS SCHEDULES

#### Sampling

A source approved to burn alternative fuels may take a sample for analysis after each addition of alternative fuel to the fuel storage tank. Said sample should be taken from the fuel line between the feed pump and the burner at least six hours after the addition but no later than 18 hours.

or

The source can sample the material prior to its addition to the storage tank.

#### Analysis

Samples taken may be blended into a composite sample and analyzed for the following parameters according to the schedule listed below.

#### Burning rate (Gallons/Weeks)

	0-2,000	2-6,000	6-15,000	15,000+
Heating Value	Semiannually	Quarterly	Monthly	Biweekly
Flash Point	Semiannually	Quarterly	Monthly	Biweekly
Viscosity	Quarterly	Monthly	Biweekly	Weekly
Halogen	Quarterly	Monthly	Biweekly	Weekly
BS & Ws	Quarterly	Monthly	Biweekly	Weekly
Lead	Quarterly	Monthly	Biweekly	Weekly
PCB's	Quarterly	Monthly	Biweekly	Weekly
Sulfur	Semiannually	Quarterly	Monthly	Biweekly
Ash	Quarterly	Monthly	Biweekly	Weekly
Arsenic	Quarterly	Monthly	Biweekly	Weekly
Cadmium	Quarterly	Monthly	Biweekly	Weekly
Chromium	Quarterly	Monthly	Biweekly	Weekly