

REAR (R)



5-2-1

SDMS DocID 259001

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

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REGION I  
WASTE MGMT. DIVISION

Mr. Merrill S. Hohman, Director  
Waste Management Division  
Environmental Protection Agency  
J.F.K. Federal Building  
Boston, MA 02203

Dear Mr. Hohman:

The State of Rhode Island, Department of Environmental Management (RIDEM) has been asked by the United States Environmental Protection Agency (USEPA) to review the preliminary draft Feasibility Study (FS) of the Davis Liquid Waste Site. In particular, USEPA wants a summary of Applicable, Relevant and Appropriate Requirements (ARARs) which may affect the selection of any of the remedial alternatives presented in the FS.

Enclosed you will find copies of all current State ARARs. These include the following:

1. Rules and Regulations for Hazardous Waste Generation, Transportation, Treatment, Storage and Disposal
2. Rules and Regulations for Solid Waste Management Facilities
3. Air Pollution Control Regulations:
  - 1 - Visible Emissions
  - 7 - Emission of Air Contaminants Detrimental to Person or Property
  - 9 - Approval to Construct, Install or Modify
  - 17 - Odors
  - \*22 - Air Toxics
4. Underground Injection Control Program Rules and Regulations
5. Public Drinking Water Regulations
6. Rules and Regulations Governing the Enforcement of the Fresh Water Wetlands Act.

\*in draft form

*in draft form*

In the Rhode Island Hazardous Waste Regulations, Hazardous Waste is defined by the following nine characteristics:

- |            |                   |
|------------|-------------------|
| Toxic      | Radioactive       |
| Reactive   | Irritating        |
| Flammable  | Strong Sensitizer |
| Corrosive  | N.O.S.            |
| Infectious |                   |

These characteristics are described in detail in section 3 of the regulations and are [REDACTED]

Extremely Hazardous Wastes are also defined in section 3, and list specific materials. These are subject to the following additional requirements:

[REDACTED] roads near the State's reservoirs.  
[REDACTED] to be considered empty.

The [REDACTED]  
[REDACTED]  
[REDACTED] and differ from Federal [REDACTED]  
[REDACTED] contaminant the

Major new facilities located in non-attainment areas must meet the Lowest Achievable Emission Rate for pollutants for which the area is in non-attainment. The Air Toxics Regulations now in draft form will require Ambient Air Levels (AALs) at or beyond the property line for about 40 compounds. The AALs are listed in the enclosed table. This regulation will be finalized by July 1, 1987. In the draft FS, during the discussion of the low temperature thermal treatment alternative, it is stated that the option is "in compliance with ... State air pollution standards." This would have to be determined from evaluation of an actual design reviewed by the Division of Air & Hazardous Materials of RI DEM. Likewise, on page 4-71, composting "is in compliance with State air pollution standards." Again, this is determined by the DAHM on a case-by-case basis and requires the submittal of detailed plans of the facility.

At the present time, it is the State's position that a  $1 \times 10^{-5}$  cancer risk, taking into account all compounds and all routes of exposure, is acceptable. For each compound, a  $1 \times 10^{-6}$  cancer risk for all routes of exposure would be acceptable. These risk levels should be used as maximum allowable risk levels to determine "how clean is clean" and the acceptability of an option for remedial action.

In general, the State concurs with the initial screening of alternatives. Although it is understood that EPA must retain the "No Action" alternatives by requirement of the National Contingency Plan, we do not feel that it is at all appropriate or realistic to choose such an option for either management of migration or source control in this case. The State is neither prepared to condemn the aquifer nor willing to allow hazardous waste and contaminated soil to remain on site. We believe EPA agrees with this position also.



Regulation No. 22

AIR TOXICS

22. Air Toxics

22.1 Definitions

As used in these regulations, the following terms shall, where the context permits, be construed as follows:

22.1.1 "Toxic substance" means any substance which:

- (a) Has been classified as a human carcinogen, suspect human carcinogen, or animal carcinogen by the International Agency for Research on Cancer (IARC), the Environmental Protection Agency (EPA), the Occupational Safety and Health Association (OSHA), the National Institute of Occupational Safety and Health (NIOSH), the American Conference of Governmental Industrial Hygienists (ACGIH), or the National Toxicology Program (NTP); or
- (b) Has been shown to induce mutagenic changes; or
- (c) Has been shown to induce fetotoxic, teratogenic, or reproductive effects; or
- (d) Has an acute toxicity of:
  - (1) LD<sub>50</sub> (oral) less than 500 mg/kg;
  - (2) LC<sub>50</sub> (inhalation) less than 2000 ppm; or
  - (3) LD<sub>50</sub> (dermal) less than 1000 mg/kg; or
- (e) Has caused significant chronic adverse effects after long term exposure.

(Remove to Guidelines)



which has been shown to induce mutagenic, carcinogenic, fetotoxic, or other acute or chronic toxic effects and is

- 22.1.1 "Listed Toxic Substance" means any ~~toxic~~ substance listed in Table I.
- 22.1.2 "Listed Toxic Air Contaminant" means any listed toxic substance emitted to the atmosphere as dust, fume, gas, mist, smoke, vapor, or soot.
- 22.1.3 "Acceptable Ambient Level" is the maximum allowable ambient air concentration of a listed toxic air contaminant contributed by a stationary source, at or beyond that facility's property line, as delineated in Tables I and II.
- 22.1.4 "Facility" means all pollutant-emitting activities which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under the control of the same person (or persons under common control). Pollutant-emitting activities shall be considered as part of the same industrial grouping if they belong to the same "major group" (i.e. which have the same two-digit code) as described in the Standard Industrial Classification Manual, 1972, as amended by the 1977 Supplement (U.S. Government Printing Office Stock Nos. 4101-0066 and 003-005-00176-0, respectively).
- 22.1.5 "Lowest Achievable Emission Rate" (LAER) means, for any stationary source, the more stringent rate of emissions of listed substances based on the following:

(a) The most stringent <sup>emission</sup> limitation for a listed substance which is contained in the implementation plan or regulations of any state for each class or category of stationary source, unless the owner or operator of the proposed stationary source demonstrates that such limitations are not achievable with state-of-the-art technology; or

(b) The most stringent emission limitation for a listed substance which is achieved in practice by such class or category of stationary source. In no event shall the application of this term allow a proposed new or modified stationary source to emit any pollutant in excess of the amount allowable under applicable new source performance standards.

22.1.6 "Stationary Source" means any building, structure, facility or installation which emits or may emit any regulated air pollutant.

22.1.7 "Existing Source" means a stationary source which is in existence on the effective date of this Regulation.

## 22.2 Applicability and Exemptions

### 22.2.1 Applicability

The provisions of this regulation shall apply to any stationary source using or generating a listed toxic substance in any process, unless exempted below.

### 22.2.2 Exemptions

The application of any pesticide or herbicide regulated under authority of the Federal Insecticide, Fungicide, Rodenticide Act (86 statute 13 et seq, as amended) or the Rhode Island Pesticide Control Act (23-25-1, et seq) shall be exempted from this regulation. It shall be the responsibility of the owner or operator of a source claiming to be exempt from the provisions of this regulation to demonstrate that the facility's use of a listed substance is regulated under the above-mentioned laws.

### 22.3 Requirement for Permits to Construct, Install, or Modify

22.3.1 No person shall construct, install, or modify or cause construction, installation, or modification of any stationary source <sup>which has the potential to increase emissions</sup> of listed toxic air contaminants <sup>by greater than the quantity specified in Table III</sup> without first obtaining an approved construction permit from the Director.

22.3.2 All permits shall be issued in accordance with the provisions and limitations of Regulation No. 9.

22.3.3 No construction permit will be issued unless it can be demonstrated, in accordance with the procedures outlined in the Rhode Island Guideline for Air Quality Modeling, that:

(a) Emissions from the proposed facility shall not cause an increase in ground level concentration of a listed toxic air contaminant, at or beyond property line of that facility, in exceedance of the Acceptable Ambient Levels, delineated in Table I; or

(b) The facility is designed to achieve LAER and emissions from that facility shall not cause an increase in ground level concentration at or beyond property line in exceedance of the Acceptable Ambient Levels with LAER, delineated in Table II.

#### 22.4 Requirement for Registration

22.4.1 Any ~~existing~~ <sup>stationary</sup> sources which used or emitted 100 pounds or more of any listed toxic substance in calendar year 1986 or which intends to use or emit 100 pounds or more of any listed <sup>toxic</sup> substance during calendar year 1987 must file a registration form with the Director within two months of the effective date of this Regulation.

#### 22.5 Requirement for Permits to Operate

22.5.1 No person shall operate a source of toxic air contaminants with the exception of those specified in Paragraph 22.6, if:

(a) Application for operating permit is not completed in accordance with the provisions of Paragraph 22.5.2; or

22.4.2 Any stationary source which initiates use of 100 pounds ~~per year~~ or more per year of a listed toxic substance must register with the Director prior to first use of that substance.

(b) An operating permit is denied, following review of the Director; or

(c) An operating permit or provisional operating permit is revoked by the Director.

22.5.2 All facilities using or emitting a listed toxic air contaminant shall file a completed operating permit application with the Department within 60 days of written notice from the Director. Prioritization of facilities for operating permit requirements shall be in accordance with the Rhode Island Air Toxics Guidelines.

22.5.3 Operating permit requirements shall be in accordance with the provisions and limitations of Regulation No. 9.

22.5.4 The Director shall issue an operating permit, if, after review of the application, associated inspection and emission test reports, and appropriate modeling results, it is determined that, in addition to compliance with the provisions of Regulation No. 9.

(a) The emissions of any listed toxic air contaminant shall not cause an increase in the ground level ambient concentration of that substance at or beyond property line in excess of the Acceptable Ambient levels, delineated in Table I; or

(b) LAER has been achieved for emissions of listed toxic substances and emissions will not cause an increase in ground level ambient concentration of that substance at or beyond property line in excess of the Acceptable Ambient Levels, with LAER, delineated in Table II.

22.5.5 If, upon review of an operating permit application and associated emissions tests and inspection reports, it is determined that the facility does not meet the requirements in Paragraph 22.5.4, the Director may issue a provisional operating permit with the following requirements:

(a) The facility must be in compliance with the provisions of Paragraph 22.5.4 within 18 months of the date of issuance of the provisional permit or another reasonable time period as specified by the Director. An additional six months may be allowed if the facility notifies the Department within 30 days of issuance of the provisional operating permit that reformulation will be attempted as a part of a strategy to reduce emissions; and

(b) Quarterly reports must be submitted to the Department demonstrating progress towards compliance with Paragraph 22.5.4.

22.5.6 If, after review of an operating permit application and associated inspection and emissions tests reports, it is determined that emissions from a facility of a listed

toxic air contaminant present an imminent threat to the surrounding community, the Director shall deny issuance of a provisional operating permit.

## 22.6 Requirements for Dry Cleaners

22.6.1 Any perchloroethylene dry cleaning machine installed after 1 ~~April~~<sup>July</sup> 1987 must be equipped with a totally enclosed refrigerated ~~cooling~~<sup>condenser</sup> system which does ~~not~~<sup>not</sup> require venting to the atmosphere.

22.6.2 All existing perchloroethylene dry cleaning machines must be equipped with one of the following control devices on or before 1 ~~September~~<sup>January</sup> 1987:

(a) A carbon adsorber which reduces perchloroethylene emissions to no more than 100 ppmv. Any distillation unit vents, washer door loading vents, storage tank vents, chemical separators, and floor vents must be routed through the carbon adsorber; or

(b) A refrigerated condenser system, provided that the dryer/condenser system is closed to the atmosphere except when articles are being loaded or unloaded and that the temperature at the dryer/condenser outlet is less than or equal to 45°F; or

(c) A "Solvation" azetropic unit which includes a carbon cannister afterfilter to control washer door loading vents; or

(d) Another system approved by the Department.

22.6.3 Any facility which uses a carbon adsorber to comply with the provisions in paragraph 22.6.2 must regenerate the carbon bed at least once for every 500 pounds of garments processed.

22.6.4 All new and existing perchloroethylene dry cleaning facilities shall be in compliance with the following requirements on or before 1 <sup>July</sup> ~~April~~ 1987;

(a) The residue from any diatomaceous earth filter must be cooked or treated so that wastes do not contain more than 25 kilograms of perchloroethylene per 100 kilograms of wet waste material; and

(b) The residue from a solvent-still must not contain more than 60 kilograms of perchloroethylene per 100 kilograms of wet waste material; and

(c) Filtration cartridges must be drained in the filter housing for at least 24 hours or vented to the control device for 12 hours before being discarded; and

(d) All perchloroethylene containing waste must be stored in sealed containers; and

(e) All leaks of perchloroethylene liquid or vapor must be repaired immediately.



Proposed Substances for Air Toxics Regulation

Draft - October 1985

Acrylonitrile	Formaldehyde (probably won't be included)
Aniline	Hydrazine
o-Anisidine	Hydrochloric acid
Arsenic	Hydrogen fluoride
Benzene	Manganese
Benzidine	Methyl cellosolve
Benzotrichloride	MDI
Benzyl chloride	MOCA
Biphenyl	Nickel
Cadmium	5-Nitro o-anisidine
Carbon tetrachloride	2-Nitropropane
Chloroform	Perchloroethylene
Chromium	Toluene
3,3' Dichlorobenzidine	TDI
1,2 Dichloroethane	o-Toluidine
Dichloromethane	1,1,2 Trichloroethane
Diethyl sulfate	Trichloroethylene
Diethyl phthalate	Triethylamine
Diphenylamine	Styrene
Epichlorohydrin	Xylenes
Ethylene oxide	

AIR POLLUTION CONTROL REGULATION NO. 7

EMISSION OF AIR CONTAMINANTS DETRIMENTAL TO PERSON OR PROPERTY

Effective 2 August 1967  
Amended 19 July 1977

RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

DIVISION OF AIR AND HAZARDOUS MATERIALS

AIR POLLUTION CONTROL REGULATION NO. 7

EMISSION OF AIR CONTAMINANTS DETRIMENTAL TO PERSON OR PROPERTY

7. Emission of Air Contaminants Detrimental to Person or Property.

No person shall emit any contaminant which either, alone or in connection with other emissions, by reason of their concentration and duration, may be injurious to human, plant or animal life, or cause damage to property or which unreasonably interferes with the enjoyment of life and property.

AIR POLLUTION CONTROL REGULATION NO. 1

VISIBLE EMISSIONS

Effective 2 August 1967  
Amended 22 February 1977

RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

DIVISION OF AIR AND HAZARDOUS MATERIALS

AIR POLLUTION CONTROL REGULATION NO. 1

VISIBLE EMISSIONS

1. Visible Exmissions

1.1 Definitions

As used in these regulations, the following terms shall, where the context permits, be construed as follows:

1.1.1 "Opacity" means the degree to which air contaminants reduce the transmission of light and obscure a contrasting background.

1.2 Limitations

No person shall emit into the atmosphere from any source any air contaminant for a period or periods aggregating more than three minutes in any one hour which is greater than or equal to 20 percent opacity.

1.3 Test Procedure and Observer Qualifications

1.3.1 All tests must be performed as per the Code of Federal Regulations, Title 40, Part 60, Appendix A, Method 9.

1.3.2 All observers must qualify as per the Code of Federal Regulations, Title 40, Part 60, Appendix A, Method 9.

1.4 Exemptions

Where the presence of uncombined water is the only reason for failure to meet the requirements of Section 1.2, such failure shall not be a violation of this regulation.

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS  
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
DIVISION OF AIR AND HAZARDOUS MATERIALS

RULES AND REGULATIONS FOR HAZARDOUS WASTE GENERATION,  
TRANSPORTATION, TREATMENT, STORAGE AND DISPOSAL

Effective 18 July 1984

Amended 20 September 1984  
29 January 1986  
7 November 1986

NOTE: Amendments to these rules and regulations appear at the  
end of this document.

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS  
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
DIVISION OF AIR AND HAZARDOUS MATERIALS

Rules And Regulations For Hazardous Waste Generation,  
Transportation, Treatment, Storage and Disposal

1.00 Findings And Policy

- 1.01 Authority: Under the authority of the 1956 Rhode Island General Laws, Chapter 23-19.1 (1979 Reenactment) and particularly Sections 23-19.1-6, 23-19.1-7 and 23-19.1-10 of that Law, the following rules and regulations are promulgated to administer this chapter, as amended, for the generation, transportation, storage, treatment and disposal of hazardous waste and shall supersede all previous rules and regulations.
- 1.02 Legislative Intent And Policy: The declaration of intent and public policy enumerated by the Legislature in Chapter 23-19.1, (1979 Reenactment), as amended, are hereby adopted as the administrative findings and policy upon which these rules and regulations are based.
- 1.03 Functions: The primary functions of the Department are the regulation of hazardous wastes and the granting, denial, suspension or revocation of permits for the operation of hazardous waste management facilities and the granting, denial, suspension or revocation or approval of the plans and specifications for the installation of any equipment in such facilities. These functions also include the permitting of hazardous waste transporters.

These regulations are intended to minimize environmental hazards associated with the generation, transportation, storage, treatment and disposal of hazardous wastes and the operation of hazardous waste treatment, storage and disposal facilities. They are also designed to promote planning and implementation of hazardous waste treatment, storage and disposal facilities where necessary and desirable.

2.00 Organization And Method Of Operations

- 2.01 Organization: Section 23-19.1-10 of the 1956 R.I.G.L., as amended, established the Department of Environmental Management as the permitting agency for hazardous waste management facilities. Section 23-19.1-6 grants the Director the authority to establish rules and regulations to ensure proper, adequate and sound hazardous waste management.
- 2.02 Permit Conditions: All permits, except transporter permits and infectious waste incinerator permits, must incorporate restrictions which are equivalent to 40 CFR Parts 264, 270.30, 270.31 and 270.33, as is or as amended.

3.00 Definitions

- 3.01 "Active portion" shall mean any portion of a hazardous waste management facility which is being used or has been used in the past to unload, store or dispose of hazardous waste.
- 3.02 "Asbestos" shall mean actinolite, amosite, anthophyllite, chrysotile, crocidolite and tremolite.

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TRANSPORTATION, TREATMENT, STORAGE AND DISPOSAL

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- 3.03 "Base flood" shall mean a flood that has a 1% or greater chance of recurring in any year. The "100 year flood plain" means any land that is subject to flooding as the result of a "base flood".
- 3.04 "Closed portion" shall mean that portion of a facility which an owner or operator has closed in accordance with the approved facility closure plan and all applicable closure requirements.
- 3.05 "Closure plan" shall mean the plan prepared for closure in accordance with these rules and regulations.
- 3.06 "Coastal high hazard area" shall mean the area subject to high velocity waters, including, but not limited to, hurricane wave wash or tsunamis as designated on Flood Insurance Rate Maps (FIRM) as Zone VI-30.
- 3.07 "Community water system" shall mean a system for the provision to the public of piped water for human consumption which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.
- 3.08 "Consignee" shall mean a person or agent to whom something is sent.
- 3.09 "Container" shall mean any portable device in which a material is stored, transported, treated, disposed of or otherwise handled.
- 3.10 "Contingency plan" shall mean a document setting out an organized, planned and coordinated course of action to be followed in case of a fire, explosion or release of hazardous waste or hazardous waste constituents which would threaten human health or the environment.
- 3.11 "Department" shall mean the Department of Environmental Management.
- 3.12 "Direct recharge area" shall mean any area in which precipitation percolates to the water table and flows through subsurface materials to a specified area of discharge. The specified area of discharge may be a reach of a stream, a spring, a well or a well field.
- 3.13 "Director" shall mean the Director of the Department of Environmental Management.
- 3.14 "Discharge" shall mean the accidental or intentional spilling, leaking, pumping, pouring, emitting, emptying or dumping of hazardous waste into or on any land or water.
- 3.15 "Disposal" shall mean the discharge, deposit, injection, dumping, spilling, leaking or placing of any hazardous waste into or on any land or water.
- 3.16 "Endangerment" shall mean the introduction of a substance into groundwater so as to cause the maximum allowable contaminant levels established in the National Primary Drinking Water Standards or the standards contained in the Public Drinking Water Regulations of the Rhode Island Department of Health to be exceeded in the groundwater; or require additional treatment of the groundwater in order not to exceed the maximum contaminant levels established in any promulgated National Primary Drinking Water Standard or the standards contained in the Public Drinking Water Regulations of the Rhode Island Department of Health.

3.17 "Extremely hazardous waste" shall mean any waste that:

- A. contains any KNOWN CARCINOGEN as designated in regulatory rule-making by any of the federal agencies (OSHA, FDA, EPA or CPSC) in concentrations or amounts at or above the federally regulated level or at 1/10 of 1% (0.1%) by weight, whichever is more stringent, of any solid or liquid mixture. This rule does not apply to asbestos waste. or
- B. contains any TERATOGEN as identified by OSHA's Industrial Hygiene Field Operation Manual (CPL 2-2.20, April 2, 1979, or subsequent updates) in concentrations or amounts at or above the federally regulated level or at 0.1% by weight, whichever is more stringent, of any solid or liquid mixture. or
- C. contains any SUSPECT HUMAN CARCINOGEN as designated in regulatory rule-making by any of the federal agencies (OSHA, FDA, EPA or CPSC) in concentrations or amounts at or above the federally regulated level or at 1% by weight whichever is more stringent, of any solid or liquid mixture. This rule does not apply to asbestos waste. or
- D. contains a substance which has an acute oral rat LD<sub>50</sub> less than or equal to 2 mg/kg in a reference approved by the Director at or above 0.1% by weight of any solid or liquid mixture, or
- E. contains any U.S. Department of Transportation Poison A or B except Carbolic Acid at or above 1% by weight of any solid or liquid mixture, or
- F. contains Industrial Chemicals selected due to their serious cumulative effects from the OSHA's Industrial Hygiene Field Operations Manual (CPL 2-2.20, April 2, 1979) and listed in Appendix 10 at or above 1% by weight of any solid or liquid mixture. However, if the industrial chemicals are less than 1% soluble, this rule only applies to these chemicals when they are soluble in the waste.

3.18 "Generator" shall mean any person, by site, who produces hazardous waste or imports hazardous waste from a foreign country or whose act or process produces hazardous waste or whose act first causes a hazardous waste to become subject to regulation.

3.19 "Hazardous waste" shall mean any waste, not including precious metal bearing wastes, or combination of wastes of a solid, liquid, contained gaseous, or semi-solid form which because of its quantity, concentration, or physical, chemical or infectious characteristics may -

- A. cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness; or
- B. pose a substantial present or potential hazard to human health or the environment.

Such wastes include, but are not limited to, those which are toxic, corrosive, flammable, irritants, strong sensitizers, substances which are assimilated or concentrated in and are detrimental to tissue, or which generate pressure through decomposition or chemical reaction.

"Hazardous waste" shall also mean any hazardous waste defined in 40 CFR 261.3, as is or as amended, and subject to regulation under 40 CFR 261.7, as is or as amended, and listed in 40 CFR 261, Subpart D, as is or as amended.

The Director may determine not to consider as a hazardous waste, materials which are beneficially used or re-used, or which are legitimately recycled or reclaimed. Such determination shall be made by the Director on a case-by-case basis following written request of the generator of the hazardous waste and upon the presentation of full documentation detailing his request, including control methods to be employed to preclude improper disposal of the material. Any such determination by the Director shall apply only to the generator making the request and not to the material in general except that treaters of hazardous waste located in Rhode Island may make application for generators located outside of Rhode Island where the state in which the generators are located do not classify the waste as hazardous. Determinations by the Director may be changed at his discretion.

The Director may determine not to consider as a hazardous waste only those materials which are beneficially used or re-used, or which are legitimately recycled or reclaimed. However, except for those materials which are listed in 40 CFR §261.6(a)(3), as is or as amended, materials which are sludges or which are listed in Subpart D of 40 CFR 261, as is or as amended, and which are transported or stored prior to being used, re-used, recycled or reclaimed, ~~must be subject to the following requirements with respect to such transportation or storage:~~

- A. Notification requirements under Section 3010 of the Resource Conservation And Recovery Act,
  - B. 40 CFR 262, as is or as amended,
  - C. 40 CFR 263, as is or as amended,
  - D. Subparts A through L of 40 CFR 264, as is or as amended,
  - E. Subparts A through L of 40 CFR 265, as is or as amended,
  - F. 40 CFR 270, as is or as amended, and
  - G. 40 CFR 124, as is or as amended, with respect to storage facilities.
- 3.20 "Hazardous waste disposal facility" shall mean real and personal property acquired, constructed or operated for the purpose of the disposal of hazardous waste.
- 3.21 "Hazardous waste incinerator" shall mean an engineered device using controlled flame combustion for thermally degrading hazardous waste.
- 3.22 "Hazardous waste management facility" shall mean a facility, excluding vehicles, for collection, source separation, storage, processing, treatment, recovery or disposal of hazardous wastes, or a transfer station for hazardous waste, and may include a facility at which such activities occur and where waste has been generated.

- 3.23 "Hazardous waste transporter" shall mean a person, individual, firm, partnership, association and private or municipal corporation that transports hazardous waste.
- 3.24 "Hazardous waste treatment or storage facility" shall mean real and personal property acquired, constructed or operated for the purpose of storing or treating hazardous wastes.
- 3.25 "Hazardous waste types" shall include but not be limited to: Type 1A - Highly Toxic; Type 1B - Moderately Toxic; Type 1C - Slightly Toxic; Type 2A - Highly Reactive; Type 2B - Moderately Reactive; Type 2C - Slightly Reactive; Type 3A - Highly Flammable; Type 3B - Moderately Flammable; Type 3C - Slightly Flammable; Type 4 - Corrosive; Type 5 - Infectious; Type 6 - Radioactive; Type 7A - Highly Irritating; Type 7B - Moderately Irritating; Type 7C - Slightly Irritating; Type 8 - Strong Sensitizer; and Type 9 - Hazardous, N.O.S. (Not Otherwise Specified).
- 3.26 "Household refuse" shall mean refuse generally produced at a home.
- 3.27 "I.D. No." shall mean the number assigned by EPA to each generator, transporter and treatment, storage or disposal facility.
- 3.28 "Incineration" shall mean the treatment of hazardous waste using controlled flame combustion, the primary purpose of which is to thermally break down the hazardous waste.
- 3.29 "Incompatible wastes" shall mean a hazardous waste which is unsuitable for:
- A. Placement in a particular device or facility because it may cause corrosion or decay of containment materials; or
  - B. Comingling with another waste or material under controlled conditions because the comingling might produce heat or pressure, fire or explosion, violent reaction, toxic dusts, mists, fumes or gases or flammable fumes or gases.
- 3.30 "Infectious waste incinerator" shall mean a hazardous waste incinerator located at a hospital, an animal care facility or a medical laboratory used exclusively for the incineration of infectious waste and non-hazardous wastes.
- 3.31 "Injection well" shall mean a well or system of wells used for the disposal of hazardous waste by pumping the waste into deep wells where they are contained in the pores of permeable subsurface rock.
- 3.32 "In operation" shall mean a facility which is treating, storing or disposing of hazardous waste.
- 3.33 "Land disposal facilities" shall mean surface impoundments, waste piles, land treatment facilities and landfills.
- 3.34 "Landfill" shall mean a disposal facility or part of a facility where hazardous waste is placed in or on land and which is not a land treatment facility, a surface impoundment, or an injection well.
- 3.35 "Land treatment facility" shall mean a facility or part of a facility at which

- hazardous waste is applied onto or incorporated into the soil surface; such facilities are disposal facilities if the waste will remain after closure.
- 3.36 "Liquid" shall mean any waste that expresses as separable liquid by weight thirty percent (30%) or more of the waste when exposed to a vacuum of 3/4 atmosphere for thirty (30) minutes.
- 3.37 "Load" shall mean a mass or weight of a particular hazardous waste contained in one or more transporting container(s).
- 3.38 "Manifest" shall mean the form provided or approved by the Rhode Island Department of Environmental Management for identifying, but not limited to, the quantity, composition, type and the origin, routing and destination of hazardous waste from the point of generation, including designated storage sites to the point of disposal or treatment.
- 3.39 "Operator" shall mean the person who is responsible for the operation of the facility.
- 3.40 "Owner" shall mean the person who owns the facility or part of the facility.
- 3.41 "Person" shall mean an individual, trust, firm, joint stock company, corporation (including a government corporation), partnership, association, the Federal Government or any agency or subdivision thereof, a state municipality, commission, political subdivision of a state, or any interstate body.
- 3.42 "Precious metal bearing wastes" shall mean all materials destined for reclamation containing a concentration of gold, silver, rhodium, palladium and/or platinum which makes the waste economically recoverable including, but not limited to, plating baths and stripping solutions but shall not include any waste listed in Subpart D of 40 CFR 261 or is a sludge.
- 3.43 "Publicly owned treatment works" shall mean a treatment works as defined by Section 212 of Public Law 92-500, "Federal Water Pollution Control Act" and which is owned by a state or municipality as defined by Section 502(4) of this same law.
- 3.44 "Sanitary septage" shall mean septage from individual sewage disposal systems containing human or animal excremental liquid or substance, any putrescible animal or vegetable matter, garbage and filth, including the discharge of water closets, laundry tubs, washing machines, sinks, dishwashers and the contents of septic tanks, cesspools or privies.
- 3.45 "Septage" shall mean any solid, liquid or semi-solid removed from septic tanks, cesspools, privies, domestic wastewater holding tanks or other similar individual sewage disposal systems.
- 3.46 "Sole source aquifer" shall mean those aquifers designated pursuant to Section 1424(e) of the Safe Drinking Water Act of 1974 (Public Law 93-523) which solely or principally supply drinking water to a large percentage of a populated area.
- 3.47 "Storage" shall mean the actual or intended containment of hazardous waste either on a temporary basis or for a period of years, in such a manner as not to constitute disposal of such hazardous waste.
- 3.48 "Surface impoundment" shall mean a facility or part of a facility which is

a natural topographic depression, man-made excavation, or diked area formed primarily of earthen materials (although it may be lined with man-made materials), which is designed to hold an accumulation of liquid wastes or waste containing free liquids, and which is not an injection well. Examples of surface impoundments are holding, storage, settling and aeration pits, ponds and lagoons.

- 3.49 "Tank" shall mean a stationary device designed to contain an accumulation of hazardous waste which is constructed primarily of non-earthen materials which provide structural support.
- 3.50 "Transfer station" shall mean an intermediate point in the transport of hazardous wastes where such wastes are brought, stored and transferred to vehicles for movement to other intermediate points or to the point of ultimate storage or disposal.
- 3.51 "Transport" shall mean the movement of wastes from the point of generation to any intermediate points, and finally to the point of final storage, treatment or disposal.
- 3.52 "Transporter" shall mean any person that transports hazardous waste.
- 3.53 "Treatment" shall mean any method, technique, or process, including neutralization or incineration, designed to change the physical, chemical, or biological character or composition of any hazardous waste as to neutralize such waste or as to render such waste less hazardous, nonhazardous, safer to transport, amenable to storage or reduced in volume, except such method or technique as may be included as part of the manufacturing process at the point of generation.
- 3.54 "Type 1A - Highly Toxic Waste" shall mean a waste which meets any of the following criteria:
- A. The elutriate obtained by applying the Toxicant Extraction Procedure (see Appendix 7) to a representative sample of the waste has any of the following properties as calculated using a recognized reference or where a recognized reference is not available as actually measured:
    - 1. An acute oral  $LD_{50}$  in the rat of 0 to 50 mg/kg of body weight determined according to the protocol in Appendix 4; or
    - 2. An acute  $LC_{50}$  in bluegills less than 0.1 ppm, according to the protocol in Appendix 2; or
    - 3. A quantitative analysis of the elutriate reveals that it contains a concentration of any substance for which an EPA Primary Drinking Water Standard has been established, equal to or greater than 100 times that standard except that the standards for Fluoride, Nitrate, Radium, Gross Alpha, Gross Beta, Turbidity and Coliform Bacteria will not be applicable under this rule; or
  - B. An octanol/water partition coefficient (P) with log P greater than 3.0, according to the protocol in Appendix 3; or

- C. Contains as a component any chemical, except asbestos, which has been designated as a carcinogen, a suspect carcinogen, mutagen, or teratogen in regulatory rule-making by any of the federal agencies (OSHA, EPA, FDA or CPSC) at or above the levels designated by the agency; or
- D. A quantitative analysis of a liquid waste reveals that it contains a substance which in the concentration present in the waste causes the waste to have a "waste LD<sub>50</sub> (calculated)" of 50 mg/kg or less, as listed in a reference source approved by the Director.

3.55 "Type 1B - Moderately Toxic Waste" shall mean a waste which meets one of the following criteria:

- A. The elutriate obtained by applying the Toxicant Extraction Procedure (see Appendix 7) to a representative sample of the waste has any of the following properties as measured and/or calculated from a reference source approved by the Director.
  - 1. An acute oral LD<sub>50</sub> in the rat greater than 50 but less than 500 mg/kg of body weight as determined according to the protocol in Appendix 4;
  - 2. An acute LC<sub>50</sub> in bluegills of less than 1 ppm but greater than 0.1 ppm (see Appendix 2).
- B. A quantitative analysis of a liquid waste reveals that it contains a substance which in the concentration present in the waste causes the waste to have a "waste LD<sub>50</sub> (calculated)" of greater than 50 mg/kg but less than 500 mg/kg of body weight as listed in a reference source approved by the Director.

3.56 "Type 1C - Slightly Toxic Waste" shall mean a waste which meets one of the following criteria:

- A. The elutriate obtained by applying the Toxicant Extraction Procedure (see Appendix 7) to a representative sample of the waste has any of the following properties as measured and/or calculated from a reference source approved by the Director.
  - 1. An acute oral LD<sub>50</sub> in the rat greater than 500 but less than 5,000 mg/kg body weight as determined according to the protocol in Appendix 4; or
  - 2. An acute LC<sub>50</sub> in bluegills greater than 1 ppm but less than 10 ppm (see Appendix 2).
- B. A quantitative analysis of a liquid waste reveals that it contains a substance which in the concentration present in the waste cause the waste to have a "waste LD<sub>50</sub> (calculated)" of greater than 500 but less than 5,000 mg/kg body weight as listed in a reference source approved by the Director.

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- 3.57 "Type 2A - Highly Reactive Waste" shall mean a waste which in itself is readily capable of initiating a detonation, or of explosive decomposition, or of reaction at normal temperatures and pressures, or which reacts explosively with water.
- 3.58 "Type 2B - Moderately Reactive Waste" shall mean a waste which in itself is capable of initiating a detonation or explosive reaction, but requires a strong initiating source, or which must be heated under confinement before initiation, or which may react violently with water or oxidizable materials or which may form potentially explosive mixtures with water or oxidizable materials, or which may generate toxic fumes such as cyanide and sulfide bearing wastes.
- 3.59 "Type 2C - Slightly Reactive Waste" shall mean a waste which in itself or when mixed with water is normally unstable or readily undergoes chemical change, but does not detonate or cause explosive reactions.
- 3.60 "Type 3A - Highly Flammable Waste" shall mean:
- A. Any liquid or gaseous material which is a liquid while under pressure, having a flash point below 73°F. and a boiling point less than 100°F., or
  - B. Any compressed gas or mixture for which a mixture of 13% or less (by volume) with air forms a flammable mixture, or the flammable range with air is wider than 12% regardless of the lower limit, or
  - C. Any non-liquid as described in 40 CFR 261.21(a)(2), as is or as amended.
  - D. Any ignitable compressed gas as described in 40 CFR 261.21(a)(3), as is or as amended, or
  - E. Any oxidizer as described in 40 CFR 261.21(a)(4), as is or as amended.
- 3.61 "Type 3B - Moderately Flammable Waste" shall mean:
- A. A liquid having a flash point less than 73°F. and a boiling point at or above 100°F., and those having a flash point at or above 73°F. and a boiling point less than 100°F., or a liquid that ignites spontaneously in dry or moist air at or below 130°F, or
  - B. Any compressed flammable gas or mixture having in the container an absolute pressure exceeding 40 psi at 70°F., or regardless of the pressure at 70°F, having an absolute pressure exceeding 104 psi at 130°F., or any liquid flammable materials having a vapor pressure exceeding 40 psi absolute at 100°F.
- 3.62 "Type 3C - Slightly Flammable Waste" shall mean:
- A. Liquids having a flash point at or above 73°F., but not exceeding 200°F.
  - B. Solids and semi-solids which readily give off flammable vapors below 100°F.
- 3.63 "Type 4 - Corrosive Waste" shall mean a waste which has any of the following properties:



- A. Any aqueous waste having a pH less than or equal to 3.0, or greater than or equal to 12.0 as determined with a pH meter using the protocol specified in the "Manual of Methods for Chemical Analysis of Water and Wastes", EPA-625-16-74 003.
  - B. A non-aqueous waste, when mixed 50% by weight with distilled water, yields an aqueous portion with a pH less than or equal to 3.0, or greater than or equal to 12.0 as measured with a pH meter using the protocol specified in the "Manual of Methods for Chemical Analysis of Water and Wastes", EPA-625-16-74 003.
  - C. A gaseous material such that a 2 molar aqueous solution yields a pH less than or equal to 3.0, or greater than or equal to 12.0 as measured with a pH meter using the protocol specified in the "Manual of Methods for Chemical Analysis of Water and Wastes", EPA-625-16-74 003.
  - D. A corrosion rate greater than 0.250 inch per year on steel (SAE 1020) at a test temperature of 130°C. as determined by NACE standard TM-01-69.
- 3.64 "Type 5 - Infectious Waste" shall mean a substance that contains microorganisms or helminths of CDC Classes 2 through 5 of the Etiologic Agents listed in Appendix 1, if generated in quantities over 200 kg/month (440 pounds).
- 3.65 "Type 6 - Radioactive Waste" shall mean all radioactive wastes except high level radioactive waste. These low level wastes include:
- A. All solid radioactive materials, and
  - B. Any gaseous or liquid radioactive materials that exceed the maximum permissible concentrations listed in Appendix A, Table II of Part A of the Rhode Island Rules and Regulations For The Control Of Radiation,
- but do not include radioactive materials specifically exempted in Section C.2 of those same regulations.
- High level wastes are wastes resulting from the operation of the first cycle solvent extraction system, or equivalent, and concentrated wastes from subsequent extraction cycles, or equivalent, in a facility for reprocessing of irradiated reactor fuel.
- 3.66 "Type 7A - Highly Irritating Waste" shall mean a waste which has a mean Draize score of 6.6 to 8.0 (see Appendix 9); or which causes visible destruction or irreversible alterations in human skin tissue at the site of contact as determined by the method in 49 CFR 173.240, Appendix D.
- 3.67 "Type 7B - Moderately Irritating Waste" shall mean a waste which has a mean Draize score of 3.1 to 6.5 (see Appendix 9).
- 3.68 "Type 7C - Slightly Irritating Waste" shall mean a waste which has a mean Draize score of 1.6 to 3.0 (See Appendix 9).

- 3.69 "Type 8 - Strong Sensitizer" shall mean a waste that produces an allergic sensitization in a substantial number of persons who come into contact with it, as determined by an appropriate test (see Appendix 5 and Appendix 6).
- 3.70 "Type 9 - Hazardous N.O.S. (Not Otherwise Specified)" shall mean a waste which may not meet any of the criteria set forth in 3.54 to 3.69 but which may still cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness or pose a substantial present or potential hazard to human health or the environment.
- 3.71 "Underground drinking water source" shall mean an aquifer supplying drinking water for human consumption; or an aquifer in which the groundwater contains less than 500 mg/l total dissolved solids; or an aquifer designated as such by the Administrator of the Environmental Protection Agency or any Rhode Island state agency authorized to do so.
- 3.72 "Vehicle" shall mean any car, truck, tractor, or other device used in transportation including any trailer, tank or other type of containment structure permanently or temporarily attached thereto.
- 3.73 "Washout" shall mean the movement of hazardous waste from the active portion of the facility as a result of flooding.
- 3.74 "Waste" shall include but not be limited to materials that are discarded or being handled prior to being discarded or have served their original intent including manufacturing and mining by-products that are being discarded. Wastes also include liners and containers of products and intermediates listed in 40 CFR §261.33(e); as is or as shall be amended, and liners and containers of extremely hazardous waste, unless the container or inner liner has been triple rinsed using a solvent capable of removing the product, intermediate or extremely hazardous waste; or cleaned by another method shown to achieve equivalent removal.
- 3.75 "Waste automotive oil" shall mean waste oil generated at such places as service stations and truck and bus repair stations and may include small, routine amounts of other petroleum distillates generated at that location.
- 3.76 "Waste automotive oil manifest" shall mean the form provided or approved by the Rhode Island Department of Environmental Management for identifying, but not limited to, the generator, transporter, quantity and destination of waste automotive oil.
- 3.77 "Waste LD<sub>50</sub> (calculated)" shall mean the value arrived at by applying to either the elutriate obtained from the Toxicant Extraction Procedure or to a liquid waste the following equation:

$$\frac{1}{\text{Waste LD}_{50}} = \frac{C_1}{(\text{LD}_{50})_1} + \frac{C_2}{(\text{LD}_{50})_2} + \dots + \frac{C_n}{(\text{LD}_{50})_n}$$

C = The concentration of a substance in a sample of the liquid waste or in the elutriate obtained by applying the Toxicant Extraction Procedure to non-liquid waste.

LD<sub>50</sub> = Oral rat LD<sub>50</sub> listed in a recognized source.

- 3.78 "Waste pile" shall mean any non-containerized accumulation of solid, non-flowing hazardous waste that is used for treatment or storage.
- 3.79 "40 CFR ..." shall mean that section or subsection of the Code of Federal Regulations, Title 40, Protection of Environment, Chapter 1, Environmental Protection Agency. References to the Administrator, appearing therein, shall be interpreted as referring to the Director.
- 3.80 "49 CFR ..." shall mean that section or subsection of the Code of Federal Regulations, Title 49, Transportation.
- 4.00 Variances
- 4.01 Applications: An applicant may apply to the Director for a variance from any of these rules and regulations. The Director then may require the submission of any survey data, drawings, soil borings and tests, calculations, scientific tests, data or other information he deems necessary to evaluate such application.
- 4.02 Non-Permit Variances: The Director may upon application issue a variance under this rule when compliance with these rules and regulations would, in the Director's judgement, and upon presentation by the applicant of adequate proof, cause unreasonable or undue hardship, provided the applicant can also present adequate proof that the issuance of a variance:
- A. will provide protection of health and the environment equivalent to that which is provided by these rules,
  - B. will not endanger the public health and safety,
  - C. will not create a public or private nuisance,
  - D. will not significantly interfere with the public use and enjoyment of any recreational resource,
  - E. will not cause pollution in any surface body of water or any groundwater, or cause contamination of any drinking water supply or tributary thereto,
  - F. will not violate any provisions of any rules or regulations adopted pursuant to Chapter 23-25 (the Rhode Island Clean Air Act) of the General Laws of Rhode Island, as amended.

The issuance or denial of a variance shall be preceded by public notice and opportunity for public comment. In no case shall the duration of any such variance exceed one year. Renewals or extensions may be given only after public notice and opportunity for public comment on each such renewal or extension.

- 4.03 Permit Variances: In addition to the requirements of Rule 4.02, the Director or his designee must hold a public hearing prior to rendering a decision on any application. Prior to the hearing, the Director shall issue public notice on the radio and in a newspaper of general circulation in the area affected and shall notify by certified mail to the last known address: all persons requesting in writing such notification, all property owners within five hundred (500) feet of the perimeter of the site of the applicant's facility, the city or town in which the facility is located and the applicant of the hearing date, time and place. Such notices shall be made at least forty-five (45) days prior to the date of the public hearing.

- 4.04 Department's Evidence: The Department through its authorized agents may present evidence to the Director or his designee relative to any application.
- 4.05 Remonstrant: Remonstrants who have been notified, as required by this rule, may present evidence to the Director or his designee relative to any application.
- 4.06 Decision: The Director or his designee may grant or deny the variance after hearing provided, however, that such variance may be subject to such terms and conditions as the Director or his designee may deem necessary to protect the public health and safety and the environment.
- 5.00 Generators: These rules shall apply to all generators of hazardous waste.
- 5.01 Identification: The generator shall apply for and obtain an EPA I.D. No. and shall not offer waste for shipment without an EPA I.D. No.. Generators, other than those not covered by the federal system, must apply directly to the Regional Office of the Environmental Protection Agency. Small generators and others not included in the federal system but covered under Rhode Island rules and regulations must apply for an EPA I.D. No. through the Department.
- 5.02 Storage: Any material designated as a hazardous waste stored at the site of generation for a period not to exceed 90 days shall be termed temporary storage and excluded from storage permit requirements provided that such waste is shipped off site within 90 days and is managed in accordance with the provisions of 40 CFR §262.34, as is or as shall be amended. Generators storing hazardous waste for a period exceeding 90 days shall obtain a storage permit unless the amount accumulated is less than 55 gallons.
- 5.03 Waste Shipment: The generator shall send hazardous waste only to a facility which is authorized to operate under either a State hazardous waste program approved under Section 3006 of the Resource Conservation And Recovery Act, as amended (RCRA) or the Federal Hazardous Waste Program under Subtitle C of RCRA. The generator must not send hazardous waste from the property on which it is generated ("on-site") without preparing a manifest to accompany the waste. "On-site" means the same or geographically contiguous property which may be divided by public or private right-of-way, provided the entrance and exit between the properties is at a cross-roads intersection, and access is by crossing as opposed to going along the right-of-way. Non-contiguous properties owned by the same person but connected by a right-of-way which he controls and to which the public does not have access is also considered on-site property.
- A. The generator must package the waste in accordance with 49 CFR 173, 178 and 179, as are or as amended.
  - B. The generator, except for those shipments of exclusively waste oil using the waste automotive oil manifest, shall complete the generator section of the manifest prior to sending any hazardous waste from the property on which it is generated. The generator shall complete this section in accordance with the requirements of 40 CFR 262.21, as is or as amended, and the requirements of these rules and regulations.

- C. After the transporter has signed the manifest, the generator shall remove Copy 6 and return it to the Department.
- D. Copy 7 of the form shall be retained with the generator's records. The remaining copies of the form shall be turned over to the transporter and shall accompany the waste through the routing indicated by the generator.
- E. A generator must instruct the transporter to return the waste if he is unable to deliver it to the designated facility.
- F. A generator sending or receiving waste to or from a foreign country shall comply with 40 CFR §262.50, as is or as shall be amended.
- G. A generator shipping wastes via rail or water must comply with the provisions of 40 CFR 262.23(c) or (d), as are or as amended, and 40 CFR 263.20(e) and (f), as is or as amended.

5.04 Labelling

- A. The generator shall label the side of all hazardous waste containers of 110 gallons or less with:
  - 1. Generator's name and address of generating facility
  - 2. The generic name of the principal hazardous waste components
  - 3. The waste type(s), name(s) and number(s)
  - 4. Date of containerization
  - 5. The Rhode Island Hazardous Waste Manifest Number
- B. The generator must label every container in accordance with the provisions of 40 CFR 262.32, as is or as amended, and must comply, with respect to the initial transporter, with the requirements of 40 CFR 262.33, as is or as amended.

5.05 Biennial Reports: The generator must prepare a biennial report in accordance with the provisions of 40 CFR 262.41, as is or as amended. The generator may also be required to submit additional reports at the request of the Director.

5.06 Record Keeping: The generator shall keep all pertinent records relating to the generation of hazardous waste for a period of three years after the waste has been delivered to an authorized facility or for such longer periods as is required in an unresolved enforcement action. These records shall include but not be limited to a copy of each manifest, a copy of each annual report, a copy of each waste analysis and a copy of any tests and other determinations made regarding the content of the waste.

5.07 Permits - No permit shall be required for the generation of hazardous waste. The generator shall, however, obtain all required permits for its hazardous waste management activities not specifically exempted by the Rhode Island Hazardous Waste Management Act or these rules and regulations.

5.08 Typing Of Hazardous Waste: The generator shall ensure that all waste generated be investigated for potential hazard. If the waste contains substances fitting the definitions of hazardous, appropriate indications must be made on labels and the manifest to accompany the waste. If the Director challenges the typing or designation of the waste by the generator, the generator shall

the Director, that the waste has been appropriately typed and designated. After the receipt of an adequate demonstration by the generator, the Director shall inform the generator of his determination within 30 days. Until the determination is made by the Director, the waste in question shall be disposed of only at a facility approved to accept wastes of the higher risk designation. Testing employed by the generator to determine if a material is a hazardous waste must be equivalent to the method set forth in 40 CFR 261, Subpart C.

5.09 Authorized Agents: The generator shall submit to the Department the names and signatures of all agents of the generator authorized to sign the manifest.

5.10 Notification of Accidental Spills: In the event of a spill of hazardous material on the generator's property which presents a substantial risk of injury to health or the environment, the generator shall notify the Department immediately of the spill. In all cases of spills, the generator shall immediately take steps to contain and clean up the hazardous material.

5.11 Inspections; Right Of Entry

A. Pursuant to Title 23, Chapter 19.1, Section 12, "Inspections; Right Of Entry", of the General Laws of Rhode Island, 1979, as amended, the Director may:

1. enter any hazardous waste management facility, or any place that the Director has reason to believe hazardous wastes are generated, stored, treated, or disposed of;
2. inspect vehicles which the Director has reasonable ground to believe are being used for the transportation of hazardous wastes;
3. inspect and obtain samples of any waste or other substances, labels, containers of waste or other substance, or samples from any vehicle in which hazardous wastes are transported or in which the Director has reason to believe hazardous wastes are transported;
4. inspect and copy records, reports, information, or test results kept or maintained at a hazardous waste management facility.

6.00 Transporters: These rules shall apply to all transporters of hazardous waste.

6.01 Permit Requirements

A. No person shall transport any hazardous wastes, including septage, in or on the land or waters of the state unless such person shall first have obtained a Hazardous Waste Transporter Permit from the Director. However, this rule shall not apply to the following activities:

1. The transportation of sewage sludge, except where the sludge fails EPA's characteristics for hazardous waste as defined in Subpart C of 40 CFR 261, as is or as amended, being produced at publicly owned treatment works.

2. The use of non-permitted vehicles to collect and transport hazardous waste in emergency situations which present a threat to public health and safety. In the event of an emergency situation, the Department shall be immediately notified of each vehicle used for the cleanup and transportation of hazardous waste. After the notification, all collected hazardous waste must be disposed of in accordance with the Department's rules and regulations.
  3. The transportation of animal waste produced at farms.
  4. A transporter transporting household refuse unless he has cause to believe that the household refuse contains hazardous waste.
- B. An application fee of \$25.00 per vehicle shall be charged the hazardous waste transporter.
  - C. The hazardous waste transporter's permit will be issued for a period not to exceed one year.
  - D. The permit will be granted or renewed only after an inspection has been made by Department personnel of all hazardous waste vehicles.

6.02 Permit Application Requirements

- A. Applications for a transporter permit must be submitted to the Director on forms provided by the Department and accompanied by a permit fee of \$25.00 per vehicle identified on the permit application. All vehicles used in the transportation of hazardous waste must be included on the permit application.
- B. All hazardous waste transporter applications must include the following:
  1. Name of applicant
  2. Mailing address
  3. EPA I.D. No.
  4. Business phone number
  5. Name and address of the owner
  6. The name, address and phone number of the applicant's personnel who can be reached in case of an emergency
  7. Year, make, VIN, capacity and registration number of each vehicle being permitted to transport hazardous waste
  8. Storage location of permitted vehicles
  9. Locations to be used for the temporary storage (up to 48 hours) in vehicles of hazardous waste.

- C. The transporter shall maintain liability insurance, including the hazardous materials rider (MCS 90) as specified in 49 CFR 387.7(d), as is or as amended, sufficient to provide coverage of \$1,000,000.00 (one million dollars) per incident. However, transporters engaged exclusively in the transportation of sanitary septage need maintain liability insurance only sufficient to provide coverage of \$300,000.00 (three hundred thousand dollars) per incident.
- D. The transporter shall apply for and obtain an EPA I.D. No.. Transporters, other than those not covered by the federal system, must apply directly to the Regional Office of the Environmental Protection Agency. Transporters not covered under the federal system must apply for an EPA I.D. No. through the Department.

6.03 General Requirements

- A. It shall be the responsibility of the transporter to obtain all other required licenses and permits from other state and federal agencies prior to transporting any hazardous waste--the transportation of which is regulated by other state and/or federal agencies.
- B. The transporter is prohibited from transporting extremely hazardous waste on the following roads:

<u>Town</u>	<u>Road</u>	<u>From</u>	<u>To</u>
Scituate, Johnston & Foster	Route 6	Route 94 Foster	Hopkins Avenue Johnston
Scituate & Smithfield	Route 116	Scituate Ave. Scituate	Snake Hill Road Smithfield
Scituate & Cranston	Route 12	Route 14 Scituate	Route 116 Scituate
Scituate	Route 14	Route 102	Route 116
Scituate & Foster	Route 102	Route 94 Foster	Snake Hill Road Glocester
Scituate & Foster	Central Pike	Route 94 Foster	Route 102 Scituate
Scituate	Danielson Pike	Route 6	Route 6
Foster	Route 94	Route 101	Route 102 Scituate
Foster & Scituate	Old Plain- field Pike	Route 102	Route 12 Scituate
Scituate	Rocky Hill Road & Peep- toad Road	Route 101	Route 116 or Sawmill Road



<u>Town</u>	<u>Road</u>	<u>From</u>	<u>To</u>
Foster, Gloucester & Scituate	Route 101	Route 94 Foster	Route 6 Scituate
Smithfield & N. Smithfield	Reservoir Road	In Its Entirety	
Smithfield & Lincoln	Route 295	Douglas Pike Exit 8 Smithfield	Route 146 Exit 9 Lincoln
Warren	School House Road	Birch Swamp Road	Long Lane
Warren	Serpentine Road	In Its Entirety	
Jamestown	North Main Road	Route 138	East Shore Road
Newport & Middletown	Bliss Mine Road	In Its Entirety	
Middletown	Miantonomi Avenue	Bliss Mine Road	Valley Road
Middletown	Valley Road	Miantonomi Road	Route 138
Middletown	Aquidneck Avenue	Wave Avenue	Valley Road
Middletown	Wave Avenue	In Its Entirety	
Little Compton & Tiverton	Route 77	Peckham Road Little Compton	Route 179, Tiverton
Tiverton	Neck Road	In Its Entirety	
Little Compton	Peckham Road	Route 77	Burchard Road
Little Compton	Burchard Road	In Its Entirety	
Cumberland	Reservoir Rd.	Route 114	Massachusetts Line
Cumberland	Route 120	Mendon Road	Massachusetts Line

- C. The roads on which the transportation of extremely hazardous waste is prohibited as listed in Regulation 6.03 B. shall be posted conspicuously in the cab of each vehicle registered to the permittee.
- D. Extremely hazardous waste that is generated on roads on which the transportation of extremely hazardous waste is prohibited may be transported on these roads with prior permission of the Director.

- E. Notification Of Accidental Spills - In the event of a spill of hazardous waste by the transporter, he shall notify the Department immediately of the spill. In all cases of spills, the transporter shall immediately take steps to contain and clean up the hazardous waste.
- F. The transporter shall submit to the Department as part of the application the following:
  - 1. A description of the procedures that shall be employed by the transporter, pursuant to Rule 6.08, in responding to spills or other emergency situations that could arise during transporters' operations. Specific references shall be made to:
    - a. the training or instruction that the transporter personnel shall receive,
    - b. the emergency and safety equipment, and
    - c. the arrangements for emergency services.
  - 2. A description of the absorbent material to be used with the cleanup of liquids.
- G. The transporter of hazardous wastes which are received in Rhode Island or which are destined for delivery to hazardous waste management facilities within Rhode Island shall not accept these wastes unless the containers of these wastes are labelled in accordance with Rule 5.04 of these rules and regulations.
- H. Transporting vehicles shall be marked on both sides and the back with the name and permit number of the transporter. These markings shall be painted on the vehicle in permanent contrasting colors and shall be visible and legible from a distance of 50 feet.
- I. Transporters of hazardous wastes into the United States or who mix wastes of different DOT descriptions into a single container must comply with all generator rules and regulations.
- J. Transporters who deliver wastes to other transporters must comply with the provisions of 40 CFR 263.20(d), as is or as amended.
- K. Transporters of wastes to foreign countries must comply with 40 CFR 263.20(g)(1) and (2), as are or as amended.
- L. These rules and regulations as applied to transporters of wastes by water (bulk shipment) are modified by 40 CFR 263.20(e)(1) and (2), as are or as amended.
- M. These rules and regulations as applied to transporters of wastes by rail are modified by 40 CFR 263.20(f), as is or as amended.

6.04 Manifest Handling

- A. The transporter of hazardous waste shall not accept any hazardous waste, except sanitary septage or waste oil, unless the generator section of the manifest has been completed by the generator. Transporters accepting waste oil only may use the waste oil manifest in lieu of the hazardous waste manifest.
- B. The transporter shall inspect the waste before accepting the waste to ensure the following:
  - 1. The number of containers match the number indicated in the generator section of the manifest.
  - 2. All containers are labelled as required by Rule 5.04.
  - 3. The total quantity of waste, as can be best estimated, matches the quantity indicated in the generator section of the manifest.
  - 4. That all containers appear sound and liquid tight.
- C. The transporter shall complete the transporter's section of the manifest and leave a signed copy with the generator.
- D. The transporter shall keep the completed manifest, minus Copies 6 and 7, with the hazardous waste until received by the consignee.
- E. The transporter will:
  - 1. upon receipt of the hazardous waste by the consignee, remove Copy 5 for his records and turn over the rest of the manifest to the consignee;
  - 2. if the consignee is located outside the state of Rhode Island, send a copy of Copy 5 completed to the Department within 10 days of delivery to the consignee.
- F. Copy 5 of the manifest shall be kept by the transporter for a period of three years from the date of the receipt of that waste.
- G. The transporter shall submit to the Director the names and signatures of all company personnel who are allowed to sign manifests.
- H. The transporter must deliver the hazardous waste only to the facility designated on the manifest. If this is not possible, he must contact the generator for further instructions.
- I. The transporter will obtain the date and signature of the facility operator at the time of transfer of the waste to the facility.

6.05 Record Keeping: The transporter shall keep all pertinent records relating to the transportation of hazardous waste for a period of three years after the waste has been delivered to an authorized facility or for such longer periods as is required in an unresolved enforcement action.

6.06 Personnel; Equipment

- A. The transporter of hazardous waste shall provide adequate personnel to ensure the activities conducted are in compliance with all applicable laws and regulations.
- B. The transporter shall make provisions to prevent personnel from wearing clothing that is contaminated with hazardous waste.
- C. The transporter shall have all equipment necessary for transporting the hazardous waste in accordance with these rules. All equipment shall be maintained in such a manner that it shall be fit for the purposes for which it was intended by the manufacturer.

6.07 Inspections

- A. The transporter must have each vehicle listed on the application inspected by the Department annually prior to the receipt or renewal of permit.
- B. The inspection shall include but not be limited to inspection of:
  - 1. Confirmation of a state safety inspection of the vehicle by the proper authority of the state in which the vehicle is registered.
  - 2. Proper identification of the transporter clearly painted on trucks and tanks or trailers including permit number.
  - 3. Proper vehicle registration(s).
  - 4. Soundness of containment structure (tank, roll-off box trailer, etc.)
  - 5. Ability of tank or other liquid containers and any valves, hoses, pipes, etc., to hold liquids without leaking.
  - 6. Prohibited roads posted.
  - 7. Emergency procedure posted.
  - 8. Communication.
  - 9. Protective clothing.
  - 10. Eyewash.
  - 11. First-aid supplies.
  - 12. Absorbent material.
- C. The transporter shall maintain all vehicles used in transportation of hazardous waste, and listed on the application, to insure compliance with all of the requirements of these rules and regulations.

6.08 Safety; Accidents

- A. Hazardous waste transporters shall be equipped with such safety equipment as to minimize chance of fire and explosion and to protect the health and safety of personnel associated with the transportation of hazardous waste and any other person who might come into contact with the waste.
- B. The transporter shall have safety equipment available for use during spills, fires and other emergencies, including a suitable means of communication for summoning aid in an emergency. The transporter shall have and maintain, but not be limited to, the following safety equipment:
  - 1. Protective clothing and equipment to enable personnel associated with the transportation to work safely with the hazardous wastes that are accepted by the transporter.
  - 2. One eyewash apparatus per vehicle which is readily available in case of emergency.
  - 3. First-aid supplies.
- C. The transporter shall make provisions for prompt control of fires, spills and other emergencies.
  - 1. The transporter shall prepare procedures for personnel to follow in the case of spills of hazardous waste and in the case of fire and other emergencies. The transporter shall post these procedures in a conspicuous place. In addition, the transporter shall train and instruct personnel associated with the transportation of hazardous waste in these procedures. The transporter shall maintain records of the training and instruction programs that are held.
  - 2. The transporter shall collect hazardous waste that is accidentally discharged from a designated hazardous waste vehicle. The transporter shall collect soil contaminated by such discharge. Such collection shall be as rapid and thorough as possible. The transporter shall handle and dispose of such waste and soil as hazardous wastes in the compliance with these rules and regulations.
  - 3. The transporter shall report immediately to the Rhode Island Department of Environmental Management all accidental discharges/spills of hazardous wastes, or any other incident or accident which results or could result in a hazard to the public health and safety, or to the environment within the State of Rhode Island. The transporter shall also comply with the notification procedures and incident reports required by 49 CFR §171.15, 171.16 and 171.17, as is or as shall be amended, regarding accidental discharge or spillage of hazardous materials or wastes.

The Director of the Rhode Island Department of Environmental Management may require that a written report of the incident or accident be provided to him.

- 6.09 Equipment used to handle hazardous waste including, but not limited to, storage containers, processing equipment, trucks and loaders that are contaminated with hazardous waste shall be decontaminated prior to being serviced or used for transportation of non-hazardous waste if servicing or use of contaminated equipment would cause a hazard to any person. Contaminated wash water, waste solutions or residues generated from washing or decontaminating the equipment shall be collected and disposed of as hazardous wastes in compliance with these rules.
- 6.10 Containerization Of Hazardous Waste: The transporter of hazardous waste shall not handle containerized hazardous waste unless the containers are constructed and maintained in accordance with the requirements of Code Of Federal Regulations, Title 49, Transportation, Part 178.
- 6.11 Powder, Dust, Fine Solids: To prevent hazardous waste from being blown by the wind, hazardous waste in the form of powder, dust or a fine solid shall be handled, stored and disposed of in covered containers.
- 6.12 Gases, Mists, Vapors: Hazardous wastes that are capable of releasing hazardous gases, mists or vapors in excess of existing air quality standards or where the emitted hazardous materials could result in a hazard to public health and safety or the environment shall be handled in covered containers.
- 6.13 Spill Control Equipment: The transporter, when transporting liquid hazardous waste in containers, shall have absorbent mats or materials on the vehicles capable of absorbing ten percent of the hazardous wastes in the event of a leak or spill. When transporting liquid hazardous waste in tank trucks, the transporter shall have a shovel and absorbent mats or materials on the vehicles capable of absorbing such small leaks as occur when hoses are disconnected.
- 6.14 Storage And Transfer Areas
- A. Storage areas shall provide spill confinement structures equal to ten percent of the containerized waste plus sufficient free board to allow for containment of precipitation resulting from a 24 hour, 25 year storm plus an additional six inches.
  - B. Temporary storage in the transporting vehicle for up to 72 hours, excluding Sundays, will only be allowed in locations approved by the Director and included on the application. This temporary storage will not require a storer's permit.
  - C. Temporary storage in the transporting vehicle at the location of a breakdown of the vehicle will only be allowed if the transporter notifies the Department of the location of the vehicle and the estimated time for repairs.
  - D. All storage activities with the exception of those allowed under 6.14 B. and C. will require a storer's permit from the Department.
- 6.15 Inspection; Right of Entry
- A. Pursuant to Title 23, Chapter 19.1, Section 12, "Inspections; Right Of Entry", of the General Laws of Rhode Island, 1979, as amended, the Director may:

1. enter any hazardous waste management facility, or any place that the Director has reason to believe hazardous wastes are generated, stored, treated, or disposed of;
2. inspect vehicles which the Director has reasonable ground to believe are being used for the transportation of hazardous wastes;
3. inspect and obtain samples of any waste or other substance, labels, containers of waste or other substance, or samples from any portion of the facility and from any vehicle in which hazardous wastes are transported or in which the Director has reason to believe hazardous wastes are transported;
4. inspect and copy records, reports, information, or test results kept or maintained at a hazardous waste management facility.

B. Any person obstructing or hindering, or in any way causing to be obstructed or hindered, the Director from the performance of his duties, or who shall refuse to permit the Director entrance to any premises, building, vehicle, plant or equipment, in the performance of his duties, shall be deemed guilty of a misdemeanor and fined not more than five hundred dollars (\$500.00).

7.00 Issuance, Renewal And Conditions Of Facility Permits: These rules shall apply to treatment, storage and disposal facilities.

7.01 A. Permits And Approvals - All persons who shall construct, substantially alter or operate a hazardous waste treatment, storage or disposal facility or who shall treat, store or dispose of hazardous waste must first obtain an operating permit or approval from the Director for such activities except that the following shall not require a permit or approval nor shall the following be required to be in compliance with any of these rules and regulations:

1. The storage of hazardous waste at the site of generation for a period of time less than 90 days.
2. The re-use, recycling or reclamation of hazardous waste at the site of generation provided that the waste is stored for a period less than 90 days provided that there is compliance with the provisions of 40 CFR 261.6(b), as is or as amended.
3. The treatment of waste at facilities which neutralize and/or treat aqueous waste at the site of generation where such treatment is subject to regulation under Sections 402 or 307(b) of the Federal Clean Water Act, as amended, and/or Section 46-12-5 of the General Laws of Rhode Island, as amended, unless otherwise required by the Director except for those operations at the facility which are not covered by either of the aforementioned laws.

Note: Any sludge or other waste materials generated from the treatment of such aqueous waste must be managed as a hazardous waste if such sludge or waste material meets the criteria of a hazardous waste.

4. The storage of any particular hazardous wastes for greater than 90 days if the generator accumulates less than 55 gallons of that waste during that time as long as the generator complies with the standards of 40 CFR 261.5(g), as is or as amended.

B. ~~Permit Restrictions~~ For Landfills And/Or ~~Incinerators~~

1. Operating permits will be granted only for those incinerator or landfill facilities for which the application can show, by a preponderance of evidence, will be located, designed, constructed and operated so as to prevent all of the following:
  - a. Endangerment of an underground drinking water source beyond the facility boundary.
  - b. Endangerment of an aquifer which has been designated by any federal or Rhode Island state agency as a sole source aquifer.
  - c. Contamination by discharge by any surface or sub-surface means causing a violation of any rule or regulation or standard of any federal or Rhode Island agency.
2. ~~Operating permits will not be granted for incinerator and/or landfill facilities which are to be located or are located in a one hundred year flood plain, a wetland, the direct recharge area of an existing or planned surface or groundwater community water system, the direct recharge area of a sole source aquifer or a coastal high hazard area, an active fault area or critical habitat.~~
3. Operating permits will be granted only for those incinerator and/or landfill facilities for which an easement is granted to the state of Rhode Island. This easement shall be recorded in the land evidence records in the city or town in which the land is located, shall describe the entire facility, and have as its purposes the identification of the facility and its use as a hazardous waste disposal facility and the allowance of access to the property by the Director for the purpose of inspection, testing and investigations relating to protection of public health and the environment.



4. Operating permits will not be granted for those incinerator and/or landfill facilities disposing of "Type 6 - Radioactive Waste" which do not possess a license from the Nuclear Regulatory Commission (NRC) or the Rhode Island Department of Health after the date of an Agreement with the NRC.
  - C. ~~Trial Burns Permits~~ - The operator of an incinerator facility, prior to the receipt of an operating permit for the incineration of hazardous waste, ~~must obtain~~ from the Director a trial burn permit in accordance with the requirements of 40 CFR 270.62, as is or as amended. Trial burn plans, required by 40 CFR 270.62, as is or as amended, must include a waste analysis in accordance with 40 CFR 264.341, as is or as amended.
  - D. Emergency Permits - The Director may, where he finds an imminent and substantial endangerment to human health or the environment, issue a temporary emergency permit to a non-permitted facility to allow the treatment, storage or disposal of hazardous waste or to a permitted facility to allow the treatment, storage or disposal of hazardous waste not covered by an effective permit subject to the requirements of 40 CFR 270.61, as is or as amended.
  - E. Existing Facilities - Existing facilities, those in operation on or before 20 January 1982, may continue to operate with the approval of the Director, until the Department renders a decision on their permit application. These facilities must be in compliance with standards equivalent to those of 40 CFR 265.
- 7.02 Permit Posting: Any permit issued hereunder shall be the property of the State and loaned to a permittee and shall be maintained on the facility and kept legible. The issuance of a permit does not convey any property rights of any sort or any exclusive privilege.
- 7.03 Change Of Ownership, Administration And/Or Location:
- A. Prior to a change in ownership of the facility or legal entity operating the facility or location or discontinuance of services, the Director shall be notified.
    1. A permit shall immediately become void and shall be returned to the Director upon change in location of any facility.
    2. A permit shall become voidable whenever there is any sale or change in ownership or membership of the legal entity operating the facility.
- A new entity, prior to the commencing of operation of the facility, shall submit to the Director information indicating its technical ability to safely operate the facility as well as its financial ability to maintain said facility. This information shall also contain a proposed date for transfer of permit responsibility, coverage, liability between current and new permittees, and any additional information which the Director may request.

After a review of this information, the Director shall either approve or disapprove the transfer of the permit.

3. The original permittee shall remain fully liable under the terms of the permit and these regulations until the owner or operator has been transferred the operation of the permit by the Director.

#### 7.04 Approval For New Areas And/Or Services

- A. The permit shall apply only to the facility in operation at the time the permit is issued. Minor modifications of permits as identified in 40 CFR 270.42, as is or as amended, shall be subject to the approval of the permitting agency and requirements of the permit.
- B. The submission of any application for modification of a permit does not stay any permit conditions.

#### 7.05 Separate Permits

- A. Separate permits shall be required for facilities which are located in separate geographical areas even though they are under the same management.
- B. Separate permits may be issued for distinct parts of a facility which can be identified as separate units.

7.06 Fees: The application fee shall be One Hundred Dollars (\$100.00). Any other necessary charges shall be determined by R.I.G.L. Section 23-19.1-14, as is or as shall be amended.

#### 7.07 Issuance, Denial, Revocation Or Suspension Of Permits

- A. The Director, after public notice and opportunity to the applicant and/or permittee for a public hearing, as afforded by Sections 23-19.1-10(b) and 23-19.1-10(e) of the R.I.G.L., is authorized to issue, deny, revoke, amend or suspend a permit. The Director shall follow procedures established by these rules and regulations and by the applicable portions of 40 CFR 124.3 and 124.5, as is or as amended.
- B. Prior to the hearing required before the issuance, suspension, revocation or amendment of a permit, the Director shall give public notice on the radio and in a newspaper of general circulation in the area affected and shall notify by certified mail to the last known address all persons requesting in writing such notification, all property owners within five hundred (500) feet of the perimeter of the site of the hazardous waste treatment or storage facility, the city or town in which the facility is located and the applicant of the hearing date, time and place. Such notices shall be made at least forty-five (45) days prior to the date of the public hearings. Public notices shall include information equivalent to that required by 40 CFR 124.10(a) and (d), as are or as amended and be provided to those persons identified in 40 CFR 124.10(c)(1), as is or as amended.

- C. At the time of public notice, the Director shall make available to the public information equivalent to that required by 40 CFR 124.6 and 124.8, as are or as amended. This information shall be provided to those persons identified in 40 CFR 124.10(c)(1), as is or as amended.
- D. All significant public comments submitted by the public prior to and during the permit hearing shall be responded to in writing by the Director.
- E. Permits may be revoked or suspended upon the initiative of any interested third party but only for the causes identified in 40 CFR 270.41, as is or as amended, or 40 CFR 270.43, as is or as amended.
- F. Whenever the permitting agency determines that a permitted hazardous waste facility is not in compliance with all of the appropriate rules and regulations established by the permitting agency, or, that the permitted facility is not being operated in conformance with approved plans or permit conditions, it may, in lieu of revocation of the permit of that facility order the permittee to take whatever corrective action to secure compliance with the rules and regulations established by the agency.
- G. Permits may not be issued for any facility for which the application does not meet the substantive requirements of Rules 8.01 - 8.04, inclusive.

7.08 Inspections

- A. The permitting agency shall make or cause to be made such inspections, take such tests and samples and to make such investigations as it deems necessary.
- B. The permitting agency or other designated authorized personnel shall conduct inspections and shall have the right to enter without prior notice to inspect any hazardous waste facility for which an application has been received or for which a permit has been issued. Any application shall constitute permission for or willingness to comply with inspections, tests and investigations by the Director or his agents.
- C. The permitting agency shall be afforded reasonable opportunity by the applicant or permittee to view the facility, examine records, obtain such required information as may be needed for inspection, testing and investigation, including the monitoring of any substances, and require the submission of reports. Refusal to allow reasonable inspections, tests and investigations or submit reports shall constitute valid grounds for denial or revocation of a permit.

Records, reports and information acquired through inspection, testing and investigation shall not be open to public inspection and their contents shall not be disclosed by the Director, except in the performance of the provisions of these rules and regulations or in the performance of his official duties.

7.09 Inspection Reports And Correction Of Deficiencies

- A. Hazardous waste facilities shall be given prompt notice by the permitting agency of deficiencies reported as a result of an inspection, test or investigation.
- B. The permittee, upon notification, shall be responsible to take immediate reasonable steps to minimize or correct any adverse impact on the environment resulting from non-compliance and shall not use a defense in any legal action that it would have been necessary to halt or reduce operations in order to maintain compliance.

7.10 Duration Of Permits: ~~Permits for hazardous waste facilities shall be issued for a period not to exceed five (5) years~~ and may be extended or renewed by the Director for a period not to exceed ten (10) years from the date upon which the original permit was effective. A new permit is required at the end of the ten year period and a complete application for that permit must be received prior to 180 days from the expiration date of the present permit.

8.00 General Requirements For All Facilities

8.01 Application Requirements

- A. All applications for permits or approvals shall be submitted to the Department and be accompanied by plans and specifications which adequately describe the facility. Additional copies may be required by the Department.
- B. All applications must be signed by an individual in accordance with the provisions of 40 CFR 270.11, as is or as amended. In instances where the applicant is not the owner of the facility, the application must be co-signed by the owner.
- C. All applications must include a statement, signed by the same person(s) who signs the application, that the signatore(s) certifies the accuracy of all information contained within the application and makes himself subject to any penalties for inaccurate statements. The certification must contain wording equivalent to that provided for in 40 CFR 270.11(d), as is or as amended.
- D. The individual signing the application for the operator will also be required to sign any reports associated with the permit.
- E. A list of all owners of property, including addresses, within 500 feet of the perimeter of the facility must be included.

8.02 Documentation Of Ownership: Each application shall be accompanied by a list of the direct and indirect owners of the facility whether individual, partnership or corporation. If a corporation, the list shall include all officers, directors and other persons owning ten percent (10%) or more of the corporate stock.

8.03 General Plan Requirements: ~~All required plans shall be stamped by a~~ professional engineer or land surveyor registered with the State of Rhode Island. The plans shall be scaled to fit a standard 24 x 36 inch sheet wherever possible and shall be submitted in duplicate.

8.04 Plans And Specifications: Each application shall include the following plans and specifications:

- A. A copy of the latest U.S. Geological Survey Topographical Map with the facility outlined on the survey.
- B. A site plan drawn to a minimum scale of one inch equals one hundred feet (1" = 100') showing the following:
  1. Onsite
    - All structures
    - Location of operational units
    - Access control
  2. Within 500 feet of the perimeter of the facility
    - All property lines
    - All water lines
  3. Within 1,000 feet of the perimeter of the facility
    - Extent of the one hundred year flood plain, where applicable
    - Water courses
    - Watersheds of public surface water supplies
    - Public and private drinking water supply wells
    - Contours sufficient to show patterns of surface drainage
    - Barriers for drainage or flood control
    - Land uses
  4. A wind rose
  5. North arrow
  6. Map scale and date
- C. The EPA I.D. No.. For facilities covered by the federal system, these numbers must be obtained from the regional office of the Environmental Protection Agency. For facilities not covered under the federal system, these numbers are obtained through the Department.
- D. Photographs of existing facilities.
- E. The name, address and telephone number of the operator of the facility.
- F. A description of the facility including processes to be used and design capacities.
- G. ~~A groundwater monitoring plan~~ capable of determining the facility's impact on the groundwater in the uppermost aquifer underlying the facility. This plan must supply information equivalent to that required by 40 CFR 264.90-100, as is or as amended. The Director may waive this rule upon written request of the operator where documented and demonstrated evidence is provided that any leakage or spillage of hazardous waste to the ground will be minimized to the greatest extent possible.

- H. A chemical and physical analysis of the hazardous wastes to be handled including the amounts of each waste and any handling information that should be known to properly handle waste in accordance with the provisions of 40 CFR Part 264, as is or as amended.
- I. A copy of the waste analysis plan equivalent to the requirements of 40 CFR 264.13, as is or as amended.
- J. A description of the security procedures and equipment required equivalent to the provisions of 40 CFR 264.14, as is or as amended.
- K. A copy of the general inspection schedule equivalent to that required by 40 CFR 264.15, as is or as amended.
- L. A description of the preparedness and prevention plans equivalent to that required by 40 CFR 264, Subpart C, as is or as amended.
- M. A copy of the contingency plan equivalent to that required by 40 CFR 264, Subpart D, as is or as amended.
- N. A description of procedures, structures or equipment used to:
  - 1. Prevent hazards in unloading.
  - 2. Prevent runoff from hazardous waste handling areas.
  - 3. Prevent contamination of water supplies.
  - 4. Mitigate effects of equipment failures and power outages.
  - 5. Prevent undue exposure of personnel to wastes.
- O. A description of precautions to prevent accidental ignition or reaction if handling flammable, reactive and/or incompatible wastes or materials.
- P. The traffic pattern, estimated volume and control.
- Q. An outline of the introductory and continuing training programs by operators equivalent to that required by 40 CFR 264.16, as is or as amended, to prepare personnel to operate or maintain the facility in a safe manner including a brief description of how training will be designed to meet actual job tasks in accordance with requirements.
- R. A copy of the closure plan that is in compliance with the requirements of 40 CFR 264, Subpart G, as is or as amended.
- S. The longitude and latitude of the facility.
- T. A closure cost estimate for the facility plus a copy of the financial assurance mechanism and a copy of the insurance policy or other documentation showing the amount of insurance carried by the facility per the requirements of 40 CFR 264, Subpart H, as is or as amended.

The wording of documents required under Subpart H must be identical to the wording specified in 40 CFR 264.151 except that the following substitutions must be made:

<u>Where the 264.151 wording says:</u>	<u>Substitute:</u>
United States Environmental Protection Agency	Rhode Island Department of Environmental Management
EPA <sup>1</sup>	DEM
United States Government <sup>2</sup>	State of Rhode Island
EPA Regional Administrator	Director
Region(s) in which the facility(ies) is(are) located	(Delete)
appropriate (when used with Regional Administrator)	(Delete)
identical (used in certifying wording)	Equivalent
Resource Conservation and Recovery Act (of 1976)	Hazardous Waste Management Act of 1978
RCRA	HWMA

<sup>1</sup>Except when used in "EPA identification number" and when used in "EPA and/or a state".

<sup>2</sup>Except when referring to securities issued by the U.S. Government.

U. For facilities that store containers of hazardous waste:

1. A description of the containment system showing that the design and construction is in conformance with 40 CFR 264.175, as is or as amended, and including:
  - a. Basic design parameters, dimensions and materials of construction.
  - b. How the design promotes drainage or how containers are kept from contact with standing liquids.
  - c. Capacity of containment system.
  - d. Provisions for run-off control/prevention.
  - e. How accumulated liquids can be analyzed and removed to prevent overflow.
2. Sketches, drawings or data demonstrating compliance with 1.
3. Where incompatible wastes are stored or otherwise managed in containers, a description of the procedures used to ensure compliance with 40 CFR 264.177, as is or as amended.
4. Where flammable or reactive wastes are stored, a description of procedures used to ensure compliance with 40 CFR 264.176, as is or as amended.

V. For facilities that use tanks to store or treat hazardous waste, a description of the design and operating procedures that are equivalent to the requirements of 40 CFR 264.191, 264.192, 264.198 and 264.199, as is or as amended including:

1. References to design standards or other available information.
2. A description of design specifications, including identification of construction and lining materials.
3. Tank dimensions, capacity and shell thickness.
4. A diagram of piping, instrumentation and process flow.
5. Description of feed systems, safety cutoff, bypass systems and pressure controls.
6. Description of procedures for handling incompatible, ignitable or reactive wastes.

W. A description of the manifest handling procedures of the facility.

X. An identification as to whether the facility is located in the 100 year flood plain.

Y. An indication of whether the facility is new or existing and whether the application is new or revised.



- 8.05 Flood Plain Operations: Treatment and storage facilities located in the 100 year flood plain must be designed, constructed and operated in accordance with standards equivalent to those of 40 CFR 264.18(b), as is or as amended.
- 8.06 Proper Operation And Maintenance: The permittee shall at all times properly operate and maintain the facility to achieve compliance with these rules and regulations. This includes adequate financing, staffing, training, laboratory and process controls and adequate back-up systems where necessary.
- 8.07 Compliance Schedules
- A. New facilities, those commencing operations after 20 January 1982 must be in compliance with all of these rules and regulations prior to the receipt of an operating permit.
  - B. Existing facilities, those in operation on or before 20 January 1982 may receive a permit prior to compliance with all of these rules and regulations only in those instances where a compliance schedule is an integral part of the permit.
  - C. Compliance schedules shall require compliance as soon as possible and shall, where entire compliance exceeds one (1) year, establish interim compliance requirements for periods less than one (1) year of duration.
  - D. Progress reports concerning interim compliance requirements shall be submitted to the Director no later than fourteen (14) days following each period for which compliance requirements were established.
- 8.08 Permit Specifications: All permits shall specify the following:
- A. The name and location of the facility.
  - B. A complete description of the operations at the facility requiring a permit with particular attention paid to any operational limitations and design capacity.
  - C. A complete description of the hazardous wastes stored and/or treated at the facility.
  - D. All monitoring requirements including specified methods and equipment.
  - E. All reporting requirements of operational and monitoring activities.
- 8.09 Major Permit Modifications: Major permit modifications, as established in 40 CFR 270.41, as is or as amended, shall require Department approval and shall be considered by the Department only in accordance with the limitations established by 40 CFR 270.41, as is or as amended. A permittee's request for modifications shall be treated as a permit application and subject to these rules and regulations and to applicable portions of 40 CFR 124.3, as is or as amended.

- 9.00 Operational Requirements For Treatment, Storage And Disposal Facilities - These rules, except Rules 9.16 and 9.20, apply to all facilities.
- 9.01 Notices
- A. The owner or operator of a facility receiving hazardous wastes from a foreign source must notify the U.S. Environmental Protection Agency Regional Administrator in writing at least four (4) weeks in advance of the date each shipment is expected at the facility.
  - B. The owner or operator of a facility receiving hazardous wastes from an off-site source (except where the operator is also the generator) must inform the generator in writing that he has the appropriate permit(s) for, and will accept, the waste the generator is shipping. The operator must keep a copy of this written notice as part of the operating record.
- 9.02 Waste Analysis: The owner or operator of the facility must maintain and comply with the waste analysis plan submitted as part of his application in accordance with Rule 8.04 I. of these rules and regulations and in accordance with 40 CFR 264.13, as is or as amended.
- 9.03 Groundwater Monitoring: The owner or operator of the facility must maintain and comply with the groundwater monitoring plan required by Rule 8.04 G. of these rules and regulations and 40 CFR 264.90 - 100, as is or as amended, unless this requirement has been waived by the Director.
- 9.04 Security: The owner or operator of the facility must maintain a security program equivalent to 40 CFR 264.14, as is or as amended.
- 9.05 Inspections: The owner or operator of the facility must maintain an inspection program equivalent to 40 CFR 264.15, as is or as amended.
- 9.06 Personnel Training: The owner or operator of the facility must provide for and maintain records of personnel training in a manner equivalent to 40 CFR 264.16, as is or as amended.
- 9.07 Flammable, Reactive Or Incompatible Wastes: The owner or operator of the facility must take precautions to prevent the accidental ignition or reaction of flammable, reactive or incompatible wastes or materials equivalent to those described in 40 CFR 264.17 and Subpart C, as is or as amended.
- 9.08 Preparedness And Prevention: The facility owner or operator must comply with preparedness and prevention requirements equivalent to those in 40 CFR 264, Subpart C, as is or as amended.
- 9.09 Contingency Plan And Emergency Procedures: The facility owner or operator must complete a contingency plan as required by 40 CFR 264, Subpart D, as is or as amended, and comply with the conditions thereof.
- 9.10 Manifests: The facility owner or operator must not accept any waste without a completed manifest and must process the manifest according to standards equivalent to 40 CFR 264.71, as is or as amended. The facility owner or operator must report the attempted delivery of all unmanifested waste.

- 9.11 Discrepancy Reports: The facility owner or operator must handle manifest discrepancies in a manner equivalent to that described in 40 CFR 264.72, as is or as amended.
- 9.12 Operating Records: The facility owner or operator must maintain an operating record equivalent to that described in 40 CFR 264.73, as is or as amended.
- 9.13 Record Availability: The facility owner or operator must make available to the Director, upon request, all records which the Director feels pertinent to the enforcement of these rules and regulations and the facility operator must maintain these records on file for a minimum of three (3) years. In the event of unresolved enforcement actions, the records must be maintained until released by the Director. Upon closure, these records must be submitted to the local governing body.
- 9.14 Biennial Report: The facility owner or operator must prepare and submit to the Director a biennial report in accordance with the dates and containing information equivalent to that required by 40 CFR 264.75, as is or as amended.
- 9.15 Authorized Agents: The facility owner or operator shall submit to the Department the names and signatures of all agents of the operator authorized to sign the manifest.
- 9.16 Closure And Post Closure: The facility owner or operator must close his facility, except incinerators and certain land disposal facilities, in accordance with the closure plan and in a manner equivalent to that required by 40 CFR 264, Subpart G, as is or as amended.
- 9.17 Financial Requirements: The facility owner or operator must meet the financial requirements per 40 CFR 264, Subpart H, as in effect on 1 July 1983, except that references to the Regional Administrator under 40 CFR 264, Subpart H, including the wording of the instruments under 40 CFR 264.151 shall refer to the Director, Rhode Island Department of Environmental Management.
- 9.18 Container Condition And Labelling
- A. The facility owner or operator must manage containers in a manner equivalent to 40 CFR 264, Subpart I, as is or as amended.
  - B. The facility owner or operator must make certain that the side of all hazardous waste containers of 110 gallons or less have attached a label with information as required by Rule 5.04 B. of these rules and regulations.
- 9.19 Tank Construction, Design And Operation: Tanks used for the storage and/or treatment of hazardous wastes must be of a design and construction equivalent to that required by 40 CFR 264, Subpart J, as is or as amended, and must be operated in a manner equivalent to that required by 40 CFR 264, Subpart J, as is or as amended.
- 9.20 Flood Plain Location: Operators of all treatment and storage facilities located in the 100 year flood plain must, if applicable, comply with the procedures identified in Rule 8.05 of these rules and regulations.

9.21 Initiator: Operators of facilities that initiate a hazardous waste shipment must comply with Rules 5.00 - 5.11 of these rules and regulations.

9.22 Other Reports: The owner or operator must report to the Director, in addition to the reports required by Rules 9.11 and 9.14 of these rules and regulations, all reports required by 40 CFR 264.77, as is or as amended.

~~10.00~~ Land Disposal Facilities: These rules apply only to land disposal facilities.

10.01 Design And Operational Requirements

A. Land disposal facilities must be designed, operated and maintained in accordance with the appropriate standards of 40 CFR 264, as is or as amended, and these rules and regulations.

1. Surface impoundments must be designed, operated and maintained in accordance with the standards of 40 CFR 264.221 - .230, as are or as amended.
2. Waste piles must be designed, operated and maintained in accordance with the standards of 40 CFR 264.250 - .258, as are or as amended.
3. Land treatment facilities must be designed, operated and maintained in accordance with the standards of 40 CFR 264.270 - .282, as are or as amended.
4. a. Landfills must be designed, operated and maintained in accordance with the standards of 40 CFR 264.300 - .316, as are or as amended.  
b. Landfills must also be located, designed and constructed in accordance with the following:
  - (1) Landfills shall be designated as Class I, Class II, Class IIIA and Class IIIB.
  - (2) All landfills shall be designed and constructed to meet the following minimum requirements:
    - (i) There shall be a minimum distance of 500 feet between any active portion of the facility and any surface body of water and any wetland.
      - (ii) The bottom liners shall be installed with a minimum slope of two percent and lead to collection sumps at all low points.
      - (iii) The boundaries of all active portions shall be at least 500 feet from any private water supply or livestock water supply.

- (iv) Erosion, landslides and slumping shall be minimized.
  - (v) Separate cells shall be provided for incompatible wastes.
  - (vi) There shall be gas collection and venting systems to prevent the lateral movement of gases generated within the landfill and to prevent the accumulation of these gases with confined structures on or adjacent to the landfill area.
- (3) Class I Landfills shall be located only in "Till" areas as identified on the Ground Water Maps prepared by the United States Geological Survey and shall include in the design the following:
- (i) A two liner system installed on the bottom and all sides of any disposal area consisting of two membrane liners.
  - (ii) A leachate monitoring, collection and removal system installed above the top liner which consists of soils at least three feet thick and which allows leachate to move rapidly through the soils and collect in sumps.
  - (iii) A minimum of six inches of sand immediately overlaying and under the membrane liner.
  - (iv) Membrane liners which meet the following requirements:
    - (a) Be of adequate strength and thickness to ensure mechanical integrity and have a minimum thickness of 30 mils.
    - (b) Be resistant to attack from soil bacteria and fungus.
    - (c) Has ample weather resistance to withstand the stress of extreme heat, freezing and thawing.
    - (d) Has adequate tensile strength to elongate sufficiently and withstand the stress of installation and/or use of machinery and equipment.
    - (e) Be of uniform thickness, free from thin spots, cracks, tears, blisters and foreign particles.
    - (f) Be placed on a stable base.

(g) ~~Has a permeability less than or equal~~  
to  $1 \times 10^{-12}$  cm/sec or its equivalent.

(h) Be seamed in a manner which does not adversely affect any property of the membrane.

(4) Class II Landfills may be located in either "Till" areas or "Outwash" areas as identified on the Ground Water Maps prepared by the United States Geological Survey and shall be of the same design as Class I Landfills.

(5) Class III Landfills may be located in either "Till" areas or "Outwash" areas as identified on the Ground Water Maps prepared by the United States Geological Survey.

Class III Landfills located in "Outwash" areas and Class III Landfills located in "Till" areas which meet the requirements of Rule 10.01 of these rules and regulations and 40 CFR 264.301 and 40 CFR 264, Subpart F, as are or as amended.

(6) The Director may approve a design that affords protection equivalent to any of the classes in Rules 10.01 A.4.b.(3), (4) and (5) of these rules and regulations. Prior to approving an equivalent design, the Director shall prepare a written opinion which shall compare and evaluate the proposed equivalent design with the requirements of the appropriate class and shall state his reasons for approving the proposed equivalent design.

This written report shall be made available to the public prior to the public hearing required by Rule 7.07 B.

(7) Class I Landfills may not accept "extremely hazardous waste", "Type 2A - Highly Reactive Waste", "Type 3A - Highly Flammable Waste" and "Type 5 - Infectious Waste, CDC Classes 3, 4 and 5 of the Etiologic Agents listed in Appendix 1".

- (8) Class II Landfills may not accept "extremely hazardous waste", "Type 1A - Highly Toxic Waste", "Type 2A - Highly Reactive Waste", "Type 2B - Moderately Reactive Waste", "Type 3A - Highly Flammable Waste", "Type 3B - Moderately Flammable Waste", "Type 5 - Infectious Waste, CDC Classes 3, 4 and 5 of the Etiologic Agents listed in Appendix 1", "Type 7A - Highly Irritating Waste" and "Type 9 - Hazardous N.O.S., (Not Otherwise Specified)".
  - (9) Class III Landfills may not accept "extremely hazardous waste", "Type 1A - Highly Toxic Waste", "Type 1B - Moderately Toxic Waste", "Type 2A - Highly Reactive Waste", "Type 2B - Moderately Reactive Waste", "Type 3A - Highly Flammable Waste", "Type 3B - Moderately Flammable Waste", "Type 5 - Infectious Waste", "Type 6 - Radioactive Waste", "Type 7A - Highly Irritating Waste", "Type 7B - Moderately Irritating Waste", "Type 8 - Strong Sensitizer" and "Type 9 - Hazardous, N.O.S. (Not Otherwise Specified)".
- 10.02 Closure And Post Closure: The facility operator must close his facility in accordance with the closure plan and in a manner equivalent to that required by 40 CFR 264, Subpart G, as is or as amended, and whichever is applicable of 40 CFR 264.228, 264.258, 264.280 or 264.310, as are or as amended.
- 11.00 Incinerator Facilities - These rules apply only to incinerator facilities.
- 11.01 Design And Operational Requirements
- A. The owner or operator of incinerator facilities must have them designed and be operated and maintained in accordance with the standards of 40 CFR 264.344, as is or as amended, and 40 CFR 264.345, as is or as amended.
  - B. The owner or operator of incinerator facilities must have them designed and be operated and maintained so that when operating they will achieve the destruction and removal efficiency and performance identified in 40 CFR 264.343, as is or as amended.
  - C. The owner or operator must identify the principal organic hazardous constituents (POHCs) in each waste stream of the trial burn plan required by Rule 7.01 C. and must treat each to the extent required by 40 CFR 264.343, as is or as amended.
  - D. The owner or operator of the facility must operate the facility in accordance with the provisions of 40 CFR 264.345, as is or as amended.
  - E. The owner or operator of the facility must close his facility in accordance with the closure plan and in a manner equivalent to that required by 40 CFR 264, Subpart G, as is or as amended, and 40 CFR 264.351, as is or as amended.

- F. The owner or operator of the facility must maintain a monitoring and inspection program equivalent to the requirements of 40 CFR 264.347, as is or as amended.

11.02 Regulation Exemptions

- A. The owners or operators of incinerator facilities operated exclusively for the incineration of hazardous wastes described in 40 CFR 264.340(b) and (c), as is or as amended, need not comply with Rules 11.01 and 6.03 of these rules and regulations.
- B. The owners or operators of incinerator facilities operated exclusively for the incineration of infectious wastes need not comply with Rules 7.01 B., 7.01 C., 8.04 A., B., I - M, O - Y, 9.02, 9.03 - 9.09, 9.14 and 9.16 - 9.19.

12.00 Penalties

- 12.01 Civil Penalty For Violations: Persons who shall violate the provisions of these rules or regulations shall be subject to penalties as provided for in Chapter 23-19.1-12 (1979 Reenactment) of the General Laws of Rhode Island, 1956, as amended.
- 12.02 Criminal Penalties For Violations: Persons who shall violate the provisions of these rules and regulations shall be subject to the penalties as provided for by Chapter 23-19.1-18, (1979 Reenactment) of the General Laws of Rhode Island, 1956, as amended.

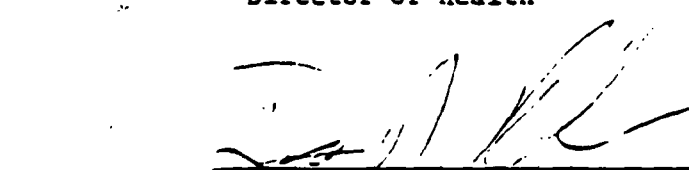
NOTE: These rules and regulations will replace the Department rules and regulations entitled: "Hazardous Waste Management Facility Operating Permit Rules And Regulations--Landfills", "Hazardous Waste Management Facility Operating Permit Rules And Regulations--Incinerators", "Hazardous Waste Generator Rules And Regulations", "Hazardous Waste Transporter Permit Rules And Regulations", "Manifesting Rules And Regulations", "Extremely Hazardous Waste Rules And Regulations", and "Rules And Regulations For Permitting And Operating Hazardous Waste Treatment And Storage Facilities".

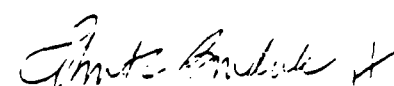


The foregoing rules and regulations, as amended, after due notice and hearing, are hereby adopted and filed with the Secretary of State this ~~25~~ <sup>28</sup> day of ~~June~~ <sup>June</sup> 1984, to become effective twenty days after filing, in accordance with the provisions of the General Laws of Rhode Island, 1956, as amended, Chapter 42-35, specifically Sections 42-35-3(a) and 42-35-4(b), Chapter 42-17.3, specifically Section 42-17.3-2; Chapter 23-19.1, specifically 23-19.1-6(A); and the Public Laws of Rhode Island, 1978, Chapter 229.

Attest A True Copy:  
Environmental Standards Board

\_\_\_\_\_  
Joseph E. Cannon, M.D.  
Director of Health

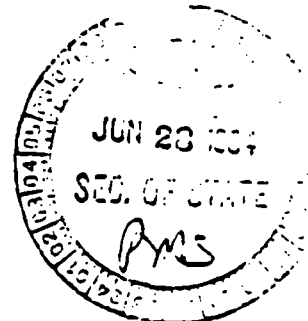
  
\_\_\_\_\_  
Don H. Kohrer  
Director of Administration

  
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Robert L. Bendick, Jr.  
Director of Environmental Management

Notice given on: 18 May 1984

Hearing held on: 15 June 1984

Filed: 6/28/84



## APPENDIX 1

### Class 2 Infectious Agents

Agents of ordinary potential hazard. This class includes agents which may produce disease of varying degrees of severity from accidental inoculation or injection or other means of cutaneous penetration but which are contained by ordinary laboratory techniques.

#### Bacterial Agents

Actinobaccilus - All species except A mallei, which is in Class 3.

Arizona hinshawii - All serotypes.

Bacillus anthracis

Bordetella - All species.

Borrelia recurrentis, B. vincenti

Clostridium botulinum, Cl. chuvaei, Cl. haemolyticum, Cl. histolyticum, Cl. novvi, Cl. septicum, Cl. tetani

Corynebacterium diphtheriae, C. equi, C. haemolyticum, C. pseudotuberculosis, C. pyogenes, C. renale

Diplococcus (Styptococcus) pneumoniae

Erysipelothrix insidiosa

Escherichia coli - All enteropathogenic serotypes.

Haemophilus ducreyi, H. influenzae

Herellea vaginicola

Klebsiella - All species and all serotypes.

Leptospira interrogans - All serotypes.

Listeria - All species.

Polymorpha

Moraxilla - All species.

Mycoplasma - All species except Mycoplasma mycoides and Mycoplasma agalactiae, which are in Class 5.

Neisseria gonorrhoeae, N. meningitidis

Pasteurella - All species except those listed in Class 3.

Salmonella - All species and all serotypes.

Shigella - All species and all serotypes.

Sphacrophorus necrophorus

Staphylococcus aureus

Streptobacillus moniliformis

Streptococcus pyogenes

Treponema caratsum, T. pallidum, and T. pertinue

Vibrio retus, V. comma, including biotype El tor and V. parahemolyticus

#### Fungal Agents

Actinomycetes (Including Nocardia species and Actinomyces species and Arachnia propionica)

Blastomyces dermatitidis

Cryptococcus neoformans

Paracoccidioides brasiliensis

#### Parasitic Agents

Endamaeba histolytica

Leishmania sp.

Naegleria gruberi

Toxoplasma gondii

Toxocara canis

Tricinella spiralis

Trypanosoma cruzi

#### Class 3 Infectious Agents

Agents involving special hazard or agents derived from outside the United States which require a federal permit for importation unless they are specified for higher classification. This class includes pathogens which require special conditions for containment.

#### Bacterial Agents

Actinobacillus mallei

Bartonella - All species.

Brucella - All species.

Francisella tularensis

Mycobacterium avium, M. bovis, M. tuberculosis

Pasteurella multocida Type B ("buffalo" and other foreign virulent strains)

Pseudomonas pseudomallei

Yersenia pestis

Fungal Agents

Histoplasma immitis

Histoplasma capsulatum

Histoplasma capsulatum var. duboisii

Parasitic Agents

Alastrum, Smallpox, Monkey pox, and Whitepox, when used in vitro.

Arboviruses - All strains except those in Class 2 and 4 (Arboviruses indigenous to the United States are in Class 3, except those listed in Class 2. West Nile and Semliki forest viruses - May be classified up or down, depending on the conditions of use, and geographical location of the laboratory).

Dengue virus - When used for transmission or animal inoculation experiments.

Lymphocytic choriomeningitis virus (LCM)

Psittacosis - Ornithosis - Trachoma - Group of agents.

Rabies street virus - When used in inoculations of carnivores (See Class 2).

Rickettsia - All species except Vola rickettsia when used for transmission or animal inoculation experiments.

Vesicular stomatitis virus

Yellow fever virus - Wild, when used in vitro.

Infectious Agents

Agents that require the most stringent conditions for their containment because they are extremely hazardous to laboratory personnel or may cause serious epidemic disease. This class includes Class 3 agents from outside the United States when they are employed in entomological experiments or when other entomological experiments are conducted in the same laboratory area.

Parasitic Agents

Alastrum, Smallpox, Monkey pox and Whitepox, when used for transmission or animal inoculation experiments.

Hemorrhagic fever agents, including Crimean hemorrhagic fever (Congo), Junin, and Machupo viruses, and others as yet undefined.

Herpesvirus Simial (Monkey B virus)

Lassa virus

Marburg virus

Tick borne encephalitis virus complex, including Russian spring-summer encephalitis, Kyasanur forest disease, Omsk hemorrhagic fever, and Central European encephalitis viruses.

Venezuelan equine encephalitis virus, epidemic strains, when used for transmission or animal inoculation experiments.

#### Class 5 Infectious Agents

Foreign animal pathogens that are excluded from the United States by law, or whose entry is restricted by USDA Administration Policy.

#### Animal Agents Excluded From The United States By Law

Virus of foot and mouth disease:

#### Animal Agents Excluded by USDA Administrative Policy

African horse sickness virus

African swine fever virus

Besnoitia besnoiti

Borna disease virus

Bovine infectious petechial fever

Camel pox virus

Ephemeral fever virus

Fowl plague virus

Coat pox virus

Hog cholera virus

Louping ill virus

Lumpy skin disease virus

Nairobi shup disease virus

Newcastle disease virus (Asiatic strains)

Mycoplasma mycoides (Contagious bovine pleuropneumonia)

Mycoplasma agalactiae (Contagious agalactia of shup)

Rickettsia ruminatum (Heart water)

Rift valley fever virus

Rinderpest virus

Shup pox virus

Swine vesicular disease virus

Teschen disease virus

Trypanosoma vivax (Nagana)

Trypanosoma evansi

Theileria parva (East coast fever)

Theileria annulata

Theileria lawrencei

Theileria bovis

Theileria hirci

Vesicular exanthema virus

Wesselsbron disease virus

Zyonaema forciminosum (Pseudofarcy)

## APPENDIX 2

### TEST PROCEDURE - ACUTE LC<sub>50</sub> IN FISH

#### Range-Finding (Screening) Test

Unless the approximate toxicity of the effluent is already known, it is necessary to conduct an abbreviated, preliminary, range-finding or screening test to determine the concentrations that should be used in the definitive tests. This test can be either a static or flow-through test. However, the test most often used is an abbreviated static test in which groups of five organisms are exposed to three to five widely-spaced effluent dilutions, and a control, for 8 to 24 hours.

Because the characteristics of the effluent and the receiving water may vary significantly within short periods of time, the toxicity observed in a range-finding test may not be representative of the toxicity of the effluent. If the range-finding test is to be conducted with the same sample of the effluent with which the definitive test is to be conducted, the duration of the range-finding test cannot exceed 24 hours.

#### Definitive Test

##### Test Conditions

The determination of the LC50 or EC50 must employ a control and at least five concentrations of effluent in an exponential series. To calculate the LC50 or EC50 with reasonable accuracy, a definitive test must meet both of the following criteria:

- A. Each concentration of the effluent must be at least 50 percent of the preceding concentration.
- B. One concentration must have killed (or affected) more than 65 percent of the organisms exposed to it, and one concentration other than the control must have killed (or affected) less than 35 percent of the organisms.

If 100 percent effluent does not kill (or affect) more than 65 percent of the organisms exposed to it, the percentage of organisms killed (or affected) by various levels of the effluent in the receiving water must be reported.

The control shall consist of the same dilution water, conditions, procedures, and organisms used in testing the effluent. A test is not acceptable if more than ten percent of the organisms die in the control.

##### Number Of Test Organisms

At least 20 organisms of a given species must be exposed to each treatment. More than one species may be used in the same test chamber in a given test, if segregated. One half of the organisms of each species exposed to each treatment should be placed in separate test chambers to serve as replicates. To qualify as true replicates, no water connections can exist between replicate test chambers. Randomization of treatments is desirable.

Test animals are normally captured for transfer from acclimation tanks to test chambers by dip netting. No more than 20 percent of the total number of organisms transferred to each chamber should be added from a given net capture.

#### Loading Of Test Organisms

For all tests, a limit must be placed on the weight of organisms per liter of test solution. This practice will minimize the depletion of dissolved oxygen, the metabolic conversation of effluent constituents, the accumulation of metabolic waste products, and/or stress induced by crowding, any of which could significantly affect the test results.

For flow-through tests, loading in the test chambers must not exceed 5 grams per liter at temperatures of 20°C. or less or 2.5 grams per liter at temperatures above 20°C.

For static tests, loading the test chambers must not exceed 0.3 grams per liter at temperatures of 20°C. or less and 0.4 grams per liter at temperatures above 20°C.

#### Test Temperature

For flow-through tests, it is desirable to hold the temperature within  $\pm 2.0^\circ\text{C}$ . of the acclimation temperature throughout the test. This can be accomplished by passing the effluent and/or dilution water through separate stainless steel coils immersed in a heating or cooling water bath prior to entering the dilutor system.

For static tests, the temperature may be that at which the test organisms were held prior to transportation or acclimation at the site. The instantaneous ambient temperature should not vary more than  $\pm 2^\circ\text{C}$ . at any time during the test.

#### Dissolved Oxygen

Aeration may alter the results of toxicity tests and, as a general rule, should not be employed. It can reduce the apparent toxicity of an effluent by stripping it of highly volatile toxic substances, or increase its toxicity by altering the pH. However, the dissolved oxygen concentration (DO) in the test solution should not be permitted to fall below 40 percent saturation for warm water species and 60 percent saturation for cold water species. In most flow-through tests, DO depletion is not a problem in the test chambers because aeration occurs as the liquids pass through the dilutor system.

If the DO concentration decreases to a level that would be a source of additional stress, the turnover rate of the solutions in the test chambers must be increased sufficiently to maintain acceptable DO levels. If the increased turnover rate does not maintain adequate DO levels, aerate the dilution water prior to the addition of the effluent, and aerate all test solutions.

Caution must be exercised to avoid excessive aeration, and it should be used only as a last resort in maintaining adequate DO levels. When aeration is used, the exact methodology must be detailed in the report.

#### Beginning The Test

The test begins when the test organisms are first exposed to the effluent.



#### A. Flow-Through Test

The dilutor system should be in operation 24 hours prior to the addition of the test organisms and at the beginning of the test. During this period, necessary adjustments can be made in the percent effluent volumes, temperature, and flow rate through the test chambers.

#### B. Static Test

The effluent is added to the dilution water and mixed well by stirring with a glass rod. The test organisms are placed in the chambers within 30 minutes. This procedure conserves DO and is sufficient for the effluent to become evenly dispersed in the dilution water.

#### Feeding

Organisms should not be fed during the test unless they are newly hatched or very young. In the case of fish, feeding should be terminated 48 hours before the beginning of the test. Problems caused by feeding, such as the possible alteration of toxicant concentration, the build-up of food and metabolic wastes and resulting oxygen demand, are common in static test systems, but are minimal in flow-through systems.

#### Duration

The test duration may range from a minimum of 8 hours to 96 hours, depending on the test organism used, the purpose of the test and whether it is a range-finding test or a definitive test.

### APPENDIX 3

#### BIOACCUMULATION POTENTIAL TEST

Specific correlations exist between octanol/water partition coefficients and bioconcentration in fish. This test thus offers a rapid, inexpensive method of identifying those mixtures which contain compounds which pose a potential bio-accumulation hazard.

Compounds with Log P greater than 3.0, but which readily biodegrade would not be expected to persist in the environment long enough for accumulation to occur. Thus a degradation option has been included in order to exempt these substances from the hazardous waste control system.

#### Chromatography Conditions

A liquid chromatograph equipped with a high pressure stopflow injector and a 254 nm ultraviolet detector with an 8 ul cell volume and 1 cm path length is employed. The column is a Varian preparative MicropakR C-H (Catalog number 07-000181-00, or its equivalent, consisting of a 250 mm x 8 mm (i.d.) stainless steel filled with 10 micron LiChrosorb to which octadecylsilane is permanently bonded.

The column is operated at ambient temperature. The solvent consists of a mixture of water and methanol (15:86, v/v) which is pumped through the column at 2.0 ml/minute.

#### Retention Volume Calibration

Chemicals are dissolved in a mixture of acetone and cyclohexane (3:1, v/v). For preparing the calibration curve the quantity of individual chemicals in the solution is adjusted to give a chromatographic peak of at least 25 percent of the recorder scale. Acetone produces a large peak at approximately 2.6 minutes.

Six chemicals for which Log P has been reported are used to calibrate the elution time in units of Log P. The calibration mixture is summarized in Table 1 and includes benzene, bromo-benzene, biphenyl, bibenzyl, p,p'-DDE, and 2,4,5,2',5'-pentachlorobiphenyl.

#### Sensitivity Calibration

The mixture is chromatographed and a calibration curve prepared daily to eliminate small differences due to flow rate or temperature and to follow the retention properties of the column during prolonged use. The calibration is made by plotting Log P versus the logarithm of the absolute retention time (Log RT). Figure 1 is an example of such a calibration curve.

#### Test Procedure

- A. Prepare a calibration curve as described above.
- B. Calculate the geometric mean of the instrumental response to the chemicals listed in Table 1 with the exception of the acetone. This value, expressed in ug/25% full scale deflection is designated the Instrumental Response (IS).
- C. Extract X liters of the TEP elutriate to be tested, using dichloromethane, and concentrate the extract to a quantity suitable for injection onto the column. The quantity X is determined by the instrumental sensitivity and is

given by the relationship: X in liters = IS in micrograms.

- D. Analyze the extract using the now calibrated chromatograph. A positive response is defined as an instrumental response greater than or equal to 2 percent full scale detector response in the region of Log P greater than or equal to 3.0.
- E. If a positive response is indicated in step D, then subject a sample of the waste to be a standard biodegradation assay and then retest. If a positive response with the degraded waste is not obtained, then the waste is not considered to be hazardous by reason of bioaccumulativeness.

TABLE 1

Partition Coefficients For Chemicals Used For Calibration

	<u>Log P</u>
Acetone	0.55
Benzene	2.13
Bromobenzene	2.99
Biphenyl	3.76
Bibenzyl	4.81
p,p'-DDE	5.69
2,4,5,2',5'-Pentachlorobiphenyl	6.11

APPENDIX 4

ACUTE ORAL LD<sub>50</sub> (RATS)

Young albino rats derived from Sprague-Dawley stock are used as test animals. All animals are kept under observation for five days prior to experimental use, during which period they are checked for general health and suitability as test animals. The animals are housed in stock cages and are permitted a standard laboratory diet plus water ad libitum, except during the 16-hour period immediately prior to oral intubation when food was withheld.

Initial screening is conducted in order to determine the general level of toxicity of the test material. Selected groups of albino rats are administered the test material at several dose levels. All doses are administered directly into the stomachs of the rats using a hypodermic syringe equipped with a ball-tipped intubating needle.

After oral administration of the test material, the rats are housed individually in suspended, wire mesh cages and observed for the following 14 days. Initial and final body weights, mortalities, and reactions are recorded. A necropsy examination is conducted on all animals.

At the end of the observation period, the acute oral median lethal dose (LD<sub>50</sub>) of the test material is calculated, if possible, using the techniques of Weil\*\*, Thompson\*\*\*, and Thompson and Weil\*\*\*\*. The test material is then assigned a classification in accordance with Harold C. Hodge\*\*\*\*\*.

\*\* Weil, Carrol S.: Fables for Convenient Calculation of Median - Effective Dose (LD<sub>50</sub> or ED<sub>50</sub>) and Instructions in Thier Use. (Biometrics, Sept. 1952.)

\*\*\* Thompson, William R.: Use of Moving Averages and Interpolation to Estimate Median - Effective Dose. Bact. Rev., Nov. 1947

\*\*\*\* Thompson, William R. and Weil, Carrol S.: On The Construction Of Fables For Moving Average Interpolation. Biometrics, March 1952.

\*\*\*\*\* Hodge, Harold C., "The LD<sub>50</sub> And Its Value", American Perfumer and Cosmetics 80, 57 (1965).

## APPENDIX 5

### SENSITIZATION TESTS

#### Guinea Pig Technique

Although the guinea pig intracutaneous techniques may not be entirely adequate (in that borderline cases of sensitization may be missed), it has been found useful to "screen out" compounds which are severe sensitizers.

White male guinea pigs weighing 300-500 grams and subsisting on a commercial rabbit pellet ration supplemented with greens (kale or lettuce) are identified, and hair removed from back and flanks by close clipping. A 0.1 percent solution or suspension in physiological saline of the material to be tested is injected intracutaneously, using a 26-gauge hypodermic needle. The injections are made every other day or three times weekly, until a total of ten have been made. The ten sensitizing injections are made at random in an area of the back and upper flanks. This area measures three or four centimeters square. The retest injection is made in an area just below the region or sites of the sensitizing injections. The first injection consists of 0.05 ml, while the remaining nine injections consist of 0.1 ml each. Two weeks after the tenth injection, a retest injection is made, using 0.05 ml of a freshly prepared solution or suspension as before. Twenty-four hours following injections, readings are made of the diameter, height and color of reaction. A comparison of the reaction following retest is made with the average of the readings taken after each of the original ten injections. If the value for the retest reading is substantially higher than for the average of the ten original readings, the substance can be considered to have produced sensitization. The degree of sensitization is proportional to the increase in the final reading compared to the average of the readings following the ten original doses.

#### Sensitization Technique In Man

The guinea pig intracutaneous techniques should be used to screen all materials to obviate exposing man to severely sensitizing substances. In the case of compounds which may be only mildly sensitizing, or in which the guinea pig method is unable to furnish unequivocal results, man appears to be the only feasible test subject. The human test should employ preferably 200 individuals (100 male and 100 female, covering as wide an age range as possible). The test material, 0.5 ml (or 0.5 gm if solid), is applied by patch to an area (randomized) on the arms or back. The patch is removed after 24 hours, and a reading of the reaction made. The area of erythema and edema is measured. The edema is estimated by the elevation of the skin with respect to the contour of the unaffected normal skin. The subjects are given a day's rest and then given a second patch application. This procedure is repeated until a series of ten consecutive exposures have been made. After this series of ten applications, the subjects are given 10 to 14 days of rest, after which a challenge or retest dose is applied once; the procedure for the retest application is similar to any one of the applications of the original ten exposures.

A comparison of the reactions observed during the ten sensitizing doses with the reaction following the retest dose permits an estimation of the degree of sensitization (if any) obtained.

Repeated patch applications of substances to both man and animals reveal that certain substances which, at a given concentration, do not produce primary irritation may elicit severe skin reactions after a number of exposures. Nevertheless, these reactions may not be considered incidents of sensitization, since after 10-14 days of rest, the skin recovers its original resistance to injury by the substance. Such substances are neither primary irritants nor sensitizers. For the lack of a better term such reactions have been called "skin fatigue". This latter term is a misnomer in that it does not imply a condition in which the skin has lost significant normal physiological function. This phenomenon consists of a subtle change in which the skin no longer exhibits its original refractoriness or resistance to the continued or repeated action of an agent. A number of chlorinated compounds, especially chlorinated phenol, are prone to produce this type of reaction.

\* eliciting this reaction may be deleted by the repeated patch technique above.

APPENDIX 6

TITLE: PATCH TESTING

METHOD: REPEAT INSULT & SENSITIZATION

REFERENCE: DRAIZE-SHELANSKY

APPLICATION: PROCEDURES PASSING ANIMAL TOXICITY AND IRRITATION TESTS

SUBJECTS

Seventy-five subjects are chosen randomly from a naive adult population; the only exclusion is people with a medical history of severe allergies.

<u>TIME FRAME:</u>	Day 1	Patches Applied
	Day 2	Patches Applied, Patches Read
	Day 3	Patches Applied, Patches Read
	Day 4	Patches Applied, Patches Read
	Day 5	Patches Applied, Patches Read
	Day 8	Patches Applied, Patches Read
	Day 9	Patches Applied, Patches Read
	Day 10	Patches Applied, Patches Read
	Day 11	Patches Applied, Patches Read
	Day 12	Patches Applied, Patches Read
	Day 13	Patches Read
	Day 36	Patches Applied
	Day 38	Patches Read
	Day 40	Patches Read

MATERIALS:

1. Elastic-patches - 1-1/2" X 2"
2. Elastic gauze bandage
3. Adhesive tape
4. Dermical cloth tape
5. 1/2" discs of highly absorbent paper (No. 740-E, Schleicher & Schuell, Inc.)
6. Indelible ink pens.

PROCEDURE:

Depending on the results of the previously conducted animal tests and the nature of the products, the tests are conducted either with the test materials at full concentrations or as three percent solutions. They are applied by saturating 1/2" filter paper discs with a product or material and placing the saturated discs, using tweezers, to the left or right upper inner arm of the patients. The application of the discs to the arm of each patient follows a definite pattern and the same pattern should be used throughout the study to facilitate readings and minimize errors. The recommended pattern is counter-clockwise starting at 11 o'clock.

To make sure the discs are applied to exactly the same spot, each area is circled with indelible waterproof ink on the second day and subsequent discs are always placed within the marked areas. To hold the saturated discs in place, they are covered with patch covers such as Elasto-Patches which have water impenetrable linings that fit over the discs and are designed to completely occlude the disc. The application of the discs should be such that the patches overlap slightly but do not violate the integrity of the occluded discs. The reason for this is that by using this pattern, the same patch covers can be used for at least five days and often for a ten day patch period which reduces irritation caused by the adhesive to a minimum.

The occluded patches are overwrapped with a gauze bandage which is held in place with adhesive tape at the top and at the bottom. From the second to the tenth test day, the gauze bandage is cut away when the patches are read and the covers are lifted in toto from one side to be able to see the reaction to the test products without having to replace each cover. After a clinician and/or a dermatologist read the spot after removal of the paper discs, the discs are replaced with new saturated ones and in the same spot as marked by the circles and the patch covers are pressed back into place. The arms are finally wrapped with gauze and bandaged as described above.

The arms are read and scored according to the following scale:

-:	No reaction
+-:	Minimal reaction
1+:	Definite erythema
2+:	Erythema with edema
3+:	Vesiculation with edema

On the eleventh day (Day 13), the patches are removed completely and the subjects, after reading, are requested to return after a three week rest period (Day 36) for re-patching. The procedure for re-patching is essentially the same as that for patching except that the patches are applied to the other arm and are applied only once and left on for 48 hours. After 48 hours, the patches are removed and the reactions are read by a clinician and/or a dermatologist. Reactions are read again 96 hours after the start of re-patching.

The repeat insult patch test procedure thus consists of two test periods, an initial period of ten days to determine irritation, and a 96 hour re-patching period to determine sensitization.



The records of patients who drop out of the study before its completion shall be kept, with an explanation of why they dropped out and the approval of the Study Director.

A protocol is written for each client's patch test, to incorporate any modifications in the general procedure necessary because of the large variety of products that this test is used for. The protocol shall be followed exactly. Any changes in the protocol shall have prior written approval, and these changes shall be attached to the protocol as a permanent record. There are retention samples kept of all products being tested in the patch test so that a portion can be returned to the client for analysis if they request it.

## APPENDIX 7

### TOXICANT EXTRACTION PROCEDURE

#### Extraction Procedure (EP)

1. A representative sample of the waste to be tested (minimum size 100 grams) should be obtained using the methods specified in Appendix 1, 40 CFR 261, or any other methods capable of yielding a representative sample within the meaning of 40 CFR 260. (For detailed guidance on conducting the various aspects of the EP see "Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods," SW-846, July, 1982, U.S. Environmental Protection Agency Office of Solid Waste, Washington, D.C. 20460.)
2. The sample should be separated into its component liquid and solid phases using the method described in "Separation Procedure" below. If the solid residue<sup>2</sup> obtained using this method totals less than 0.5% of the original weight of the waste, the residue can be discarded and the operator should treat the liquid phase as the extract and proceed immediately to Step 8.
3. The solid material obtained from the Separation Procedure should be evaluated for its particle size. If the solid material has a surface area per gram of material equal to or greater than 3.1 cm.<sup>2</sup> or passes through a 9.5 mm (0.375 inch) standard sieve, the operator should proceed to Step 4. If the surface area is smaller or the particle size larger than specified above, the solid material should be prepared for extraction by crushing, cutting or grinding the material so that it passes through a 9.5 mm (0.375 inch) sieve or, if the material is in a single piece, by subjecting the material to the "Structural Integrity Procedure" described below.
4. The solid material obtained in Step 3 should be weighed and placed in an extractor with 16 times its weight of deionized water. Do not allow the material to dry prior to weighing. For purposes of this test, an acceptable extractor is one which impart sufficient agitation to the mixture to not only prevent stratification of the sample and extraction fluid but also insure that all sample surfaces are continuously brought into contact with well mixed extraction fluid.
5. After the solid material and deionized water are placed in the extractor, the operator should begin agitation and measure the pH of the solution in the extractor. If the pH is greater than 5.0, the pH of the solution should be decreased to  $5.0 \pm 0.2$  by adding 0.5 N acetic acid. If the pH is equal to or less than 5.0, no acetic acid should be added. The pH of the solution should be monitored, as described below, during the course of the extraction and if the pH rises above 5.2, 0.5 N acetic acid should be added to bring the pH down to  $5.0 \pm 0.2$ . However, in no event shall the aggregate amount of acid added to the solution exceed 4 ml of acid per gram of solid. The mixture should be agitated for 24 hours and maintained at 20°-40°C (68°-104°F) during the time. It is recommended that the operator monitor and adjust the pH during the course of the extraction with a device such as the Type 45A pH Controller manufactured by Chemtrix, Inc., Hillsboro, Oregon 97123 or its equivalent, in conjunction with a metering pump and reservoir of 0.5 N acetic acid. If such a system is not available, the following manual procedure shall be employed:

- (a) A pH meter should be calibrated in accordance with the manufacturer specifications.
  - (b) The pH of the solution should be checked and, if necessary, 0.5 N acetic acid should be manually added to the extractor until the pH reaches  $5.0 \pm 0.2$ . The pH of the solution should be adjusted at 15, 30 and 60 minute intervals, moving to the next longer interval if the pH does not have to be adjusted more than 0.5 N pH units.
  - (c) The adjustment procedure should be continued for at least 6 hours.
  - (d) If at the end of the 24-hour extraction period the pH of the solution is not below 5.2 and the maximum amount of acid (4 ml per gram of solids) has not been added, the pH should be adjusted to  $5.0 \pm 0.2$  and the extraction continued for an additional four hours, during which the pH should be adjusted at one hour intervals.
6. At the end of the 24 hour extraction period, deionized water should be added to the extractor in an amount determined by the following equation:
- $$V = (20)(W) - 16 (W) - A$$
- V = ml deionized water to be added  
W = weight in grams of solid charged to extractor  
A = ml of 0.5 N acetic acid added during extraction
7. The material in the extractor should be separated into its component liquid and solid phases as described under "Separation Procedure."
  8. The liquids resulting from Steps 2 and 7 should be combined. This combined liquid (or the waste itself if it has less than  $\frac{1}{2}$  percent solids, as noted in Step 2) is the extract and should be analyzed for the presence of any of the contaminants specified in Table I of §261.24 using the Analytical Procedures designated below.

#### Separation Procedure

Equipment: A filter holder, designed for filtration media having a nominal pore size of 0.45 micrometers and capable of applying a  $5.3 \text{ kg/cm}^2$  (75 psi) hydrostatic pressure to the solution being filtered shall be used. For mixtures containing nonabsorptive solids, where separation can be affected without imposing a  $5.3 \text{ kg/cm}^2$  pressure differential, vacuum filters employing a 0.45 micrometers filter media can be used. (For further guidance on filtration equipment or procedures see "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods.")

#### Procedure:<sup>3</sup>

- (i) Following manufacturer's directions, the filter unit should be assembled with a filter bed consisting of a 0.45 micrometer filter membrane. For difficult or slow to filter mixtures, a prefilter bed consisting of the following prefilters in increasing pore size (0.65 micrometer membrane, fine glass fiber prefilter and coarse glass fiber prefilter) can be used.
- (ii) The waste should be poured into the filtration unit.
- (iii) The reservoir should be slowly pressurized until liquid begins to flow from the filtrate outlet at which point the pressure in the filter should be immediately lowered to 10-15 psig. Filtration should be continued until liquid flow ceases.

- (iv) The pressure should be increased stepwise in 10 psi increments to 75 psig and filtration continued until flow ceases or the pressurizing gas begins to exit from the filtrate outlet.
- (v) The filter unit should be depressurized, the solid material removed and weighed and then transferred to the extraction apparatus, or, in the case of final filtration prior to analysis, discarded. Do not allow the material retained on the filter pad to dry prior to weighing.
- (vi) The liquid phase should be stored at 4°C for subsequent use in Step 8.

#### Structural Integrity Procedure

Equipment: A Structural Integrity Tester having a 3.18 cm (1.25 in.) diameter hammer weighing 0.33 kg (0.73 lbs.) and having a free fall of 15.24 cm (6 in.) shall be used. This device is available from Associated Design and Manufacturing Company, Alexandria, VA 22314, as Part No. 125, or it may be fabricated to meet the specifications shown in Figure 1.

#### Procedure:

1. The sample holder should be filled with the material to be tested. If the sample of waste is a large monolithic block, a portion should be cut from the block having the dimensions of 3.3 cm. (1.3 in.) diameter x 7.1 cm. (2.8 in.) cylinder. For a fixated waste, samples may be cast in the form of a 3.3 cm. (1.3 in.) diameter x 7.1 cm. (2.8 in.) cylinder for purposes of conducting this test. In such cases, the waste may be allowed to cure for 30 days prior to further testing.
2. The sample holder should be placed into the Structural Integrity Tester, then the hammer should be raised to its maximum height and dropped. This should be repeated fifteen times.
3. The material should be removed from the sample holder, weighed and transferred to the extraction apparatus for extraction.

#### Analytical Procedures For Analyzing Extract Contaminants

The test methods for analyzing the extract are as follows:

- (1) For arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, endrin, lindane, methoxychlor, toxaphene, 2,4-D(2,4,-dichlorophenoxyacetic acid) or 2,4,5-TP (2,4,5-trichlorophenoxypropionic acid): "Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods."
- (2) For all analyses, the methods of standard addition shall be used for quantification of species concentration.

<sup>1</sup>Copies may be obtained from Solid Waste Information, U.S. Environmental Protection Agency, 26 W. St. Clair Street, Cincinnati, Ohio 45268.

<sup>2</sup>The percent solids is determined by drying the filter pad at 80°C until it reaches constant weight and then calculating the percent solids using the following equation:

$$- \frac{(\text{weight of pad + solid}) - (\text{tare weight of pad})}{\text{initial weight of sample}} \times 100 = \% \text{ solids}$$

<sup>3</sup>This procedure is intended to result in separation of the "free" liquid portion of the waste from any solid matter having a particle size 0.45  $\mu\text{m}$ . If the sample will not filter, various other separation techniques can be used to aid in the filtration. As described above, pressure filtration is employed to speed up the filtration process. This does not alter the nature of the separation. If liquid does not separate during filtration, the waste can be centrifuged. If separation occurs during centrifugation, the liquid portion (centrifugate) is filtered through the 0.45  $\mu\text{m}$  filter prior to becoming mixed with the liquid portion of the waste obtained from the initial filtration. Any material that will not pass through the filter after centrifugation is considered a solid and is extracted.

APPENDIX 8

The flash point of liquids must be determined by the Pensky-Martens Closed Cup Tester, using the test method specified in ASTM Standard D-93-79 or a Setafash Closed Cup Tester using the test method specified in ASTM standard D-3278.

Flammable gases shall be tested in accordance with the Bureau of Explosives and may include but are not limited to methods using Flame Projection Apparatus, Open Cup Apparatus or Closed Cup Apparatus.

## APPENDIX 9

### PRIMARY SKIN IRRITATION TEST - ALBINO RABBITS

Young albino rabbits of the New Zealand strain were used in the evaluation of the primary skin irritating properties of the test material. The test procedure was modeled after that of Draize et al.\*

Prior to the application of the test material, the hair was clipped from the back and flanks of each rabbit. Two test sites located lateral to the midline of the back approximately ten centimeters apart were selected. One of the two sites was abraded by making four epidermal incisions, two perpendicular to the other two, while the other test site remained intact.

The test material was applied to each of the test sites on each rabbit and occluded with gauze patches which were secured with masking tape. The trunk of each animal was then wrapped with impervious plastic sheeting. The wrap held the patches in position and retarded evaporation of the test material during the 24-hour exposure period.

At the end of 24 hours, the plastic wrappings, patches and all residual test material were removed. The intact and abraded test sites were examined and scored separately for erythema and edema on a graded scale of 0 to 4. After 72 hours, the sites were again examined and scored.

In evaluating the average irritation present, the mean scores for erythema and edema of the intact test sites after 24 and 72 hours were added. Similarly, the mean scores for erythema and edema of the abraded test sites after 24 and 72 hours were added. These two values were totaled and divided by four to obtain the mean primary irritation score.

The following grading system was used to arrive at a primary skin irritation classification:

<u>Mean Primary Irritation Score</u> <u>(Range of Values)</u>	<u>Classification</u>
0	Nonirritating
0.1 - 0.5	Minimally Irritating
0.6 - 1.5	Slightly Irritating
1.6 - 3.0	Mildly Irritating
3.1 - 5.0	Moderately Irritating
5.1 - 6.5	Severely Irritating
6.6 - 8.0	Extremely Irritating

The scoring criteria for erythema and edema are shown in the following table:

\*Draize, John H., Woodard, Geoffrey, and Calbery, Herbert O., "Methods for the Study of Irritation and Toxicity of Substances Applied Topically to the Skin and Mucous Membranes," J. Pharm. & Exp. Ther. 82, 377 (1944).

TABLE

Primary Skin Irritation Test - Albino Rabbits  
 Scoring Criteria For Skin Reactions

Reactions	Description	Score
	Barely perceptible (Edges of area not defined)	1
	Pale red in color and area definable	2
	Definite red in color and area well defined	3
	Best or crimson red in color	4
Edema	Barely perceptible (Edges of area not defined)	1
	Area definable but not raised more than 1 mm	2
	Area well defined and raised approximately 1 mm	3
	Area raised more than 1 mm	4
Injury In Depth	Escharosis, Necrosis	8
	Maximum Primary Irritation Score =	8

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Appendix 10

OSHA Industrial Chemicals With Serious Cumulative Effects As Of 2 April 1979

2-Acetylene tetrabromide*	Cyclohexylamine (skin)
Acrylamide	2-n-Dibutyl aminoethanol
Allyl chloride	p-Dichlorobenzene
Ancimony compounds*	1,2-Dichloroethylene
Anisidine	Dichloroethyl ether (skin)
Benzyl chloride	Dichloromonofluoromethane (F21)
Bromoform (Tribromo methane)*	Dicyclopentadiene (Bicyclopentadiene)
Bucylamine	Diethylamine
tert-Bucyl chromate	Difluorodibromomethane
n-Bucyl glycidyl ether (BGE)	Diglycidyl ether (DGE)
Calcium cyanamide	Dimethylamine
Carbon tetrabromide	Dimethylformamide
Catechol (Pyrocatechol)*	o-Dinitroresol
Chlordane	3,5-o-Dinitrotoluamide (Zoolane <sup>®</sup> ) (Dinitrobenzamide)
Chlorinated camphene (skin)	Dinitrotoluene
Chlorinated diphenyl oxide	Disulfiram*
Chlorobenzene (monochlorobenzene)	Endosulfan (Thiodan <sup>®</sup> )*
Chlorobromomethane	Epichlorohydrin
Chlorodiphenyl	Ethanolamine
o-Chlorostyrene	2-Ethoxyethyl acetate
Coal tar pitch	Ethyl bromide
Crag <sup>®</sup> (1,3-Bis(2,2,2-trichloro-1-hydroxyethyl))	Ethylenediamine
Cyclohexanol	Ethylene glycol dinitrate
Cyclohexanone	Ethylene oxide
Cyclohexene	Ethyl silicate

\*In solution

OSHA Industrial Chemicals With Serious Cumulative Effects As Of 2 April 1979 (Cont'd)

Terban	Methyl isocyanate
Fluorine (gas)	Methyl silicate
Formamide	Molybdenum*
Hafnium	Monomethyl aniline
Hexachlor	Morpholine
Hexachlorocyclopentadiene	Naphthalene*
Hexachloroethane*	Nitrogen trifluoride*
Hexachloronaphthalene	2-Nitropropane
Hydrogenated terphenyls	Nitrotoluene
Hydrogen fluoride	Octachloronaphthalene
Hydrogen selenide	Oxygen difluoride (gas)
Hydroquinone	Pentachloronaphthalene
Indene (Indonaphthene)	Perchloroethylene (Tetrachloroethylene)
Maleic anhydride	Perchloroyl fluoride
Manganese cyclopentadienyl tricarbonyl	p-Phenylene diamine
Mercury and mercuric compounds*	Phenyl ether
Methoxychlor*	Phenylhydrazine
Methyl acrylate (acrylic acid, methyl ester)	Phenylphosphine
Methylal	Phosphorous trichloride
Methyl cellosolve and acetate	Picric acid (dry)
Methyl chloride	Pival <sup>R</sup>
Methylcyclohexanol	Platinum*
Methylcyclopentadienyl manganese tricarbonyl	Propylene dichloride
Methylene bisphenyl isocyanate (MDI)	Propylene oxide
Methyl ethyl ketone peroxide	n-Propyl nitrate
Methyl Iodide	Quinone
*In solution	Pyridine

OSHA Industrial Chemicals With Serious Cumulative Effects As Of 2 April 1979 (Cont.)

Resorcinol

Rotenone\*

Sulfuryl fluoride

Tellurium\*

1,1,2,2-Tetrachloroethane

Tetrachloronaphthalene

Tetraethyl lead

Tetramethyl lead

Tetrahydrofuran\*

Tetryl

Tin, organic compounds\*

1,1,2 Trichloroethane

Trichloronaphthalene

1,2,3-Trichloropropane

Uranium\*

Vinyl bromide

Vinyl cyclohexane dioxide

Vinylidene chloride\*

Warfarin

Xylidine

\*in solution

Rhode Island Rules And Regulations For The Control Of Radiation

APPENDIX A

CONCENTRATIONS IN AIR AND WATER ABOVE NATURAL BACKGROUND

(See notes at end of appendix)

Element (atomic number)	Isotope <sup>1</sup>	Table I		Table II		
		Column 1 Air (uc/ml)	Column 2 Water (uc/ml)	Column 1 Air (uc/ml)	Column 2 Water (uc/ml)	
Actinium (89)	Ac 227	S	2X10 <sup>-12</sup>	6X10 <sup>-5</sup>	8X10 <sup>-14</sup>	2X10 <sup>-6</sup>
		I	3X10 <sup>-11</sup>	9X10 <sup>-3</sup>	9X10 <sup>-13</sup>	3X10 <sup>-4</sup>
	Ac 228	S	8X10 <sup>-8</sup>	3X10 <sup>-3</sup>	3X10 <sup>-9</sup>	9X10 <sup>-5</sup>
		I	2X10 <sup>-8</sup>	3X10 <sup>-3</sup>	6X10 <sup>-10</sup>	9X10 <sup>-5</sup>
Americium (95)	Am 241	S	6X10 <sup>-12</sup>	1X10 <sup>-4</sup>	2X10 <sup>-13</sup>	4X10 <sup>-6</sup>
		I	1X10 <sup>-10</sup>	8X10 <sup>-4</sup>	4X10 <sup>-12</sup>	3X10 <sup>-5</sup>
	Am 242 m	S	6X10 <sup>-12</sup>	1X10 <sup>-4</sup>	2X10 <sup>-13</sup>	4X10 <sup>-6</sup>
		I	3X10 <sup>-10</sup>	3X10 <sup>-3</sup>	9X10 <sup>-12</sup>	9X10 <sup>-5</sup>
	Am 242	S	4X10 <sup>-8</sup>	4X10 <sup>-3</sup>	1X10 <sup>-9</sup>	1X10 <sup>-1</sup>
		I	5X10 <sup>-8</sup>	4X10 <sup>-3</sup>	2X10 <sup>-9</sup>	1X10 <sup>-4</sup>
	Am 243	S	6X10 <sup>-12</sup>	1X10 <sup>-4</sup>	2X10 <sup>-13</sup>	4X10 <sup>-6</sup>
		I	1X10 <sup>-10</sup>	8X10 <sup>-4</sup>	4X10 <sup>-12</sup>	3X10 <sup>-5</sup>
Am 244	S	4X10 <sup>-6</sup>	1X10 <sup>-1</sup>	1X10 <sup>-7</sup>	5X10 <sup>-3</sup>	
	I	2X10 <sup>-5</sup>	1X10 <sup>-1</sup>	8X10 <sup>-7</sup>	5X10 <sup>-3</sup>	
Antimony (51)	Sb 122	S	2X10 <sup>-7</sup>	8X10 <sup>-4</sup>	6X10 <sup>-9</sup>	3X10 <sup>-5</sup>
		I	1X10 <sup>-7</sup>	8X10 <sup>-4</sup>	5X10 <sup>-9</sup>	3X10 <sup>-5</sup>
	Sb 124	S	2X10 <sup>-7</sup>	7X10 <sup>-4</sup>	5X10 <sup>-9</sup>	2X10 <sup>-5</sup>
		I	2X10 <sup>-8</sup>	7X10 <sup>-4</sup>	7X10 <sup>-10</sup>	2X10 <sup>-5</sup>
Sb 125	S	5X10 <sup>-7</sup>	3X10 <sup>-3</sup>	2X10 <sup>-8</sup>	1X10 <sup>-4</sup>	
	I	3X10 <sup>-8</sup>	3X10 <sup>-3</sup>	9X10 <sup>-10</sup>	1X10 <sup>-4</sup>	
Argon (18)	A 37	Sub <sup>2</sup>	6X10 <sup>-3</sup>	-----	1X10 <sup>-4</sup>	-----
	A 41	Sub	2X10 <sup>-6</sup>	-----	4X10 <sup>-8</sup>	-----
Arsenic (33)	As 73	S	2X10 <sup>-6</sup>	1X10 <sup>-2</sup>	7X10 <sup>-8</sup>	5X10 <sup>-4</sup>
		I	4X10 <sup>-7</sup>	1X10 <sup>-2</sup>	1X10 <sup>-8</sup>	5X10 <sup>-4</sup>
	As 74	S	3X10 <sup>-7</sup>	2X10 <sup>-3</sup>	1X10 <sup>-8</sup>	5X10 <sup>-5</sup>
		I	1X10 <sup>-7</sup>	2X10 <sup>-3</sup>	4X10 <sup>-9</sup>	5X10 <sup>-5</sup>
	As 76	S	1X10 <sup>-7</sup>	6X10 <sup>-4</sup>	4X10 <sup>-9</sup>	2X10 <sup>-5</sup>
		I	1X10 <sup>-7</sup>	6X10 <sup>-4</sup>	3X10 <sup>-9</sup>	2X10 <sup>-5</sup>
As 77	S	5X10 <sup>-7</sup>	2X10 <sup>-3</sup>	2X10 <sup>-8</sup>	8X10 <sup>-5</sup>	
	I	4X10 <sup>-7</sup>	2X10 <sup>-3</sup>	1X10 <sup>-8</sup>	8X10 <sup>-5</sup>	
Astatine (85)	At 211	S	7X10 <sup>-9</sup>	5X10 <sup>-5</sup>	2X10 <sup>-10</sup>	2X10 <sup>-6</sup>
		I	3X10 <sup>-8</sup>	2X10 <sup>-3</sup>	1X10 <sup>-9</sup>	7X10 <sup>-5</sup>
Barium (56)	Ba 131	S	1X10 <sup>-6</sup>	5X10 <sup>-3</sup>	4X10 <sup>-8</sup>	2X10 <sup>-4</sup>
		I	4X10 <sup>-7</sup>	5X10 <sup>-3</sup>	1X10 <sup>-8</sup>	2X10 <sup>-4</sup>
	Ba 140	S	1X10 <sup>-7</sup>	8X10 <sup>-4</sup>	4X10 <sup>-9</sup>	3X10 <sup>-5</sup>
		I	4X10 <sup>-8</sup>	7X10 <sup>-4</sup>	1X10 <sup>-9</sup>	2X10 <sup>-5</sup>
Berkelium (97)	Bk 249	S	9X10 <sup>-10</sup>	2X10 <sup>-2</sup>	3X10 <sup>-11</sup>	6X10 <sup>-4</sup>
		I	1X10 <sup>-7</sup>	2X10 <sup>-2</sup>	4X10 <sup>-9</sup>	6X10 <sup>-4</sup>
	Bk 250	S	1X10 <sup>-7</sup>	6X10 <sup>-3</sup>	5X10 <sup>-9</sup>	2X10 <sup>-4</sup>
		I	1X10 <sup>-6</sup>	6X10 <sup>-3</sup>	4X10 <sup>-8</sup>	2X10 <sup>-4</sup>
Beryllium (4)	Be 7	S	6X10 <sup>-6</sup>	5X10 <sup>-2</sup>	2X10 <sup>-7</sup>	2X10 <sup>-3</sup>
		I	1X10 <sup>-6</sup>	5X10 <sup>-2</sup>	4X10 <sup>-8</sup>	2X10 <sup>-3</sup>

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APPENDIX A

CONCENTRATIONS IN AIR AND WATER ABOVE NATURAL BACKGROUND

[See notes at end of appendix]

Element (atomic number)	Isotope <sup>1</sup>	Table I		Table II		
		Column 1 Air (uc/ml)	Column 2 Water (uc/ml)	Column 1 Air (uc/ml)	Column 2 Water (uc/ml)	
Bismuth (83)	Bi 206	S	2X10 <sup>-7</sup>	1X10 <sup>-3</sup>	6X10 <sup>-9</sup>	4X10 <sup>-5</sup>
		I	1X10 <sup>-7</sup>	1X10 <sup>-3</sup>	5X10 <sup>-9</sup>	4X10 <sup>-5</sup>
	Bi 207	S	2X10 <sup>-7</sup>	2X10 <sup>-3</sup>	6X10 <sup>-9</sup>	6X10 <sup>-5</sup>
		I	1X10 <sup>-8</sup>	2X10 <sup>-3</sup>	5X10 <sup>-10</sup>	6X10 <sup>-5</sup>
	Bi 210	S	6X10 <sup>-9</sup>	1X10 <sup>-3</sup>	2X10 <sup>-10</sup>	4X10 <sup>-5</sup>
		I	6X10 <sup>-9</sup>	1X10 <sup>-3</sup>	2X10 <sup>-10</sup>	4X10 <sup>-5</sup>
Bi 212	S	1X10 <sup>-7</sup>	1X10 <sup>-2</sup>	3X10 <sup>-9</sup>	4X10 <sup>-4</sup>	
	I	2X10 <sup>-7</sup>	1X10 <sup>-2</sup>	7X10 <sup>-9</sup>	4X10 <sup>-4</sup>	
Bromine (35)	Br 82	S	1X10 <sup>-6</sup>	8X10 <sup>-3</sup>	4X10 <sup>-9</sup>	5X10 <sup>-4</sup>
		I	2X10 <sup>-7</sup>	1X10 <sup>-3</sup>	6X10 <sup>-9</sup>	4X10 <sup>-5</sup>
Cadmium (48)	Cd 109	S	5X10 <sup>-8</sup>	5X10 <sup>-3</sup>	2X10 <sup>-9</sup>	2X10 <sup>-4</sup>
		I	7X10 <sup>-8</sup>	5X10 <sup>-3</sup>	3X10 <sup>-9</sup>	2X10 <sup>-4</sup>
	Cd 115 m	S	4X10 <sup>-8</sup>	7X10 <sup>-4</sup>	1X10 <sup>-9</sup>	3X10 <sup>-5</sup>
		I	4X10 <sup>-8</sup>	7X10 <sup>-4</sup>	1X10 <sup>-9</sup>	3X10 <sup>-5</sup>
	Cd 115	S	2X10 <sup>-7</sup>	1X10 <sup>-3</sup>	8X10 <sup>-9</sup>	3X10 <sup>-5</sup>
		I	2X10 <sup>-7</sup>	1X10 <sup>-3</sup>	6X10 <sup>-9</sup>	4X10 <sup>-5</sup>
Calcium (20)	Ca 45	S	5X10 <sup>-8</sup>	3X10 <sup>-4</sup>	1X10 <sup>-9</sup>	9X10 <sup>-6</sup>
		I	1X10 <sup>-7</sup>	5X10 <sup>-3</sup>	4X10 <sup>-9</sup>	2X10 <sup>-4</sup>
	Ca 47	S	2X10 <sup>-7</sup>	1X10 <sup>-3</sup>	6X10 <sup>-9</sup>	5X10 <sup>-5</sup>
		I	2X10 <sup>-7</sup>	1X10 <sup>-3</sup>	6X10 <sup>-9</sup>	3X10 <sup>-5</sup>
Californium (98)	Cf 249	S	2X10 <sup>-12</sup>	1X10 <sup>-4</sup>	5X10 <sup>-14</sup>	4X10 <sup>-6</sup>
		I	1X10 <sup>-10</sup>	7X10 <sup>-4</sup>	3X10 <sup>-12</sup>	2X10 <sup>-5</sup>
	Cf 250	S	5X10 <sup>-12</sup>	4X10 <sup>-4</sup>	2X10 <sup>-13</sup>	1X10 <sup>-5</sup>
		I	1X10 <sup>-10</sup>	7X10 <sup>-4</sup>	3X10 <sup>-12</sup>	3X10 <sup>-5</sup>
	Cf 251	S	2X10 <sup>-12</sup>	1X10 <sup>-4</sup>	6X10 <sup>-14</sup>	4X10 <sup>-6</sup>
		I	1X10 <sup>-10</sup>	8X10 <sup>-4</sup>	3X10 <sup>-12</sup>	3X10 <sup>-5</sup>
	Cf 252	S	6X10 <sup>-2</sup>	2X10 <sup>-4</sup>	2X10 <sup>-3</sup>	7X10 <sup>-6</sup>
		I	3X10 <sup>-11</sup>	2X10 <sup>-4</sup>	1X10 <sup>-12</sup>	7X10 <sup>-6</sup>
	Cf 253	S	8X10 <sup>-10</sup>	4X10 <sup>-3</sup>	3X10 <sup>-11</sup>	1X10 <sup>-4</sup>
		I	8X10 <sup>-10</sup>	4X10 <sup>-3</sup>	3X10 <sup>-11</sup>	1X10 <sup>-4</sup>
Cf 254	S	5X10 <sup>-12</sup>	4X10 <sup>-6</sup>	2X10 <sup>-13</sup>	1X10 <sup>-7</sup>	
	I	5X10 <sup>-12</sup>	4X10 <sup>-6</sup>	2X10 <sup>-13</sup>	1X10 <sup>-7</sup>	
Carbon (6)	C 14 (CO <sub>2</sub> )	S	4X10 <sup>-6</sup>	2X10 <sup>-2</sup>	1X10 <sup>-7</sup>	8X10 <sup>-4</sup>
		Sub	5X10 <sup>-5</sup>	-----	1X10 <sup>-6</sup>	-----
Cerium (58)	Ce 141	S	4X10 <sup>-7</sup>	3X10 <sup>-3</sup>	2X10 <sup>-8</sup>	9X10 <sup>-5</sup>
		I	2X10 <sup>-7</sup>	3X10 <sup>-3</sup>	5X10 <sup>-9</sup>	9X10 <sup>-5</sup>
	Ce 143	S	3X10 <sup>-7</sup>	1X10 <sup>-3</sup>	9X10 <sup>-9</sup>	4X10 <sup>-5</sup>
		I	2X10 <sup>-7</sup>	1X10 <sup>-3</sup>	7X10 <sup>-9</sup>	4X10 <sup>-5</sup>
	Ce 144	S	1X10 <sup>-8</sup>	3X10 <sup>-4</sup>	3X10 <sup>-10</sup>	1X10 <sup>-5</sup>
		I	6X10 <sup>-9</sup>	3X10 <sup>-4</sup>	2X10 <sup>-10</sup>	1X10 <sup>-5</sup>
Cesium (55)	Cs 131	S	1X10 <sup>-5</sup>	7X10 <sup>-2</sup>	4X10 <sup>-7</sup>	2X10 <sup>-3</sup>

APPENDIX A

CONCENTRATIONS IN AIR AND WATER ABOVE NATURAL BACKGROUND

[See notes at end of appendix]

Element (atomic number)	Isotops <sup>1</sup>	Table I		Table II			
		Column 1 Air (uc/ml)	Column 2 Water (uc/ml)	Column 1 Air (uc/ml)	Column 2 Water (uc/ml)		
Cesium (55)	Cs 134 m	I	3X10 <sup>-6</sup>	3X10 <sup>-2</sup>	1X10 <sup>-7</sup>	9X10 <sup>-4</sup>	
		S	4X10 <sup>-5</sup>	2X10 <sup>-1</sup>	1X10 <sup>-6</sup>	6X10 <sup>-3</sup>	
	Cs 134	I	6X10 <sup>-6</sup>	3X10 <sup>-2</sup>	2X10 <sup>-7</sup>	1X10 <sup>-3</sup>	
		S	4X10 <sup>-8</sup>	3X10 <sup>-4</sup>	1X10 <sup>-9</sup>	9X10 <sup>-6</sup>	
	Cs 135	I	1X10 <sup>-8</sup>	1X10 <sup>-3</sup>	4X10 <sup>-10</sup>	4X10 <sup>-5</sup>	
		S	5X10 <sup>-7</sup>	3X10 <sup>-3</sup>	2X10 <sup>-8</sup>	1X10 <sup>-4</sup>	
	Cs 136	I	9X10 <sup>-8</sup>	7X10 <sup>-3</sup>	3X10 <sup>-9</sup>	2X10 <sup>-4</sup>	
		S	4X10 <sup>-7</sup>	2X10 <sup>-3</sup>	1X10 <sup>-8</sup>	9X10 <sup>-5</sup>	
	Cs 137	I	2X10 <sup>-7</sup>	2X10 <sup>-3</sup>	6X10 <sup>-9</sup>	6X10 <sup>-5</sup>	
		S	6X10 <sup>-8</sup>	4X10 <sup>-4</sup>	2X10 <sup>-9</sup>	2X10 <sup>-5</sup>	
	Chlorine (17)	Cl 36	I	1X10 <sup>-8</sup>	1X10 <sup>-3</sup>	5X10 <sup>-10</sup>	4X10 <sup>-5</sup>
			S	4X10 <sup>-7</sup>	2X10 <sup>-3</sup>	1X10 <sup>-8</sup>	8X10 <sup>-5</sup>
Chlorine (17)	Cl 38	I	2X10 <sup>-8</sup>	2X10 <sup>-3</sup>	8X10 <sup>-10</sup>	6X10 <sup>-5</sup>	
		S	3X10 <sup>-6</sup>	1X10 <sup>-2</sup>	9X10 <sup>-8</sup>	4X10 <sup>-4</sup>	
Chromium (24)	Cr 51	I	2X10 <sup>-6</sup>	1X10 <sup>-2</sup>	7X10 <sup>-8</sup>	4X10 <sup>-4</sup>	
		S	1X10 <sup>-5</sup>	5X10 <sup>-2</sup>	4X10 <sup>-7</sup>	2X10 <sup>-3</sup>	
Cobalt (27)	Co 57	I	2X10 <sup>-6</sup>	5X10 <sup>-2</sup>	8X10 <sup>-8</sup>	2X10 <sup>-3</sup>	
		S	3X10 <sup>-6</sup>	2X10 <sup>-2</sup>	1X10 <sup>-7</sup>	5X10 <sup>-4</sup>	
	Co 58 m	I	2X10 <sup>-7</sup>	1X10 <sup>-2</sup>	6X10 <sup>-9</sup>	4X10 <sup>-4</sup>	
		S	2X10 <sup>-5</sup>	8X10 <sup>-2</sup>	6X10 <sup>-7</sup>	3X10 <sup>-3</sup>	
	Co 58	I	9X10 <sup>-6</sup>	6X10 <sup>-2</sup>	3X10 <sup>-7</sup>	2X10 <sup>-3</sup>	
		S	8X10 <sup>-7</sup>	4X10 <sup>-3</sup>	3X10 <sup>-8</sup>	1X10 <sup>-4</sup>	
Copper (29)	Cu 64	I	5X10 <sup>-8</sup>	3X10 <sup>-3</sup>	2X10 <sup>-9</sup>	9X10 <sup>-5</sup>	
		S	3X10 <sup>-7</sup>	1X10 <sup>-3</sup>	1X10 <sup>-8</sup>	5X10 <sup>-5</sup>	
Copper (29)	Cu 64	I	2X10 <sup>-9</sup>	1X10 <sup>-3</sup>	3X10 <sup>-10</sup>	3X10 <sup>-5</sup>	
		S	2X10 <sup>-6</sup>	1X10 <sup>-2</sup>	7X10 <sup>-8</sup>	3X10 <sup>-4</sup>	
Curium (96)	Cm 242	I	1X10 <sup>-6</sup>	6X10 <sup>-3</sup>	4X10 <sup>-8</sup>	2X10 <sup>-4</sup>	
		S	1X10 <sup>-10</sup>	7X10 <sup>-4</sup>	4X10 <sup>-12</sup>	2X10 <sup>-5</sup>	
	Cm 243	I	2X10 <sup>-10</sup>	7X10 <sup>-4</sup>	6X10 <sup>-12</sup>	2X10 <sup>-5</sup>	
		S	6X10 <sup>-12</sup>	1X10 <sup>-4</sup>	2X10 <sup>-13</sup>	5X10 <sup>-6</sup>	
	Cm 244	I	1X10 <sup>-10</sup>	7X10 <sup>-4</sup>	3X10 <sup>-12</sup>	2X10 <sup>-5</sup>	
		S	9X10 <sup>-12</sup>	2X10 <sup>-4</sup>	3X10 <sup>-13</sup>	7X10 <sup>-6</sup>	
	Cm 245	I	1X10 <sup>-10</sup>	8X10 <sup>-4</sup>	3X10 <sup>-12</sup>	3X10 <sup>-5</sup>	
		S	5X10 <sup>-12</sup>	1X10 <sup>-4</sup>	2X10 <sup>-13</sup>	4X10 <sup>-6</sup>	
	Cm 246	I	1X10 <sup>-10</sup>	8X10 <sup>-4</sup>	4X10 <sup>-12</sup>	3X10 <sup>-5</sup>	
		S	5X10 <sup>-12</sup>	1X10 <sup>-4</sup>	2X10 <sup>-13</sup>	4X10 <sup>-6</sup>	
	Cm 247	I	1X10 <sup>-10</sup>	8X10 <sup>-4</sup>	4X10 <sup>-12</sup>	3X10 <sup>-5</sup>	
		S	5X10 <sup>-12</sup>	1X10 <sup>-4</sup>	2X10 <sup>-13</sup>	4X10 <sup>-6</sup>	
	Cm 248	I	1X10 <sup>-10</sup>	6X10 <sup>-4</sup>	4X10 <sup>-12</sup>	2X10 <sup>-5</sup>	
		S	6X10 <sup>-13</sup>	1X10 <sup>-5</sup>	2X10 <sup>-14</sup>	4X10 <sup>-7</sup>	
	Cm 248	I	1X10 <sup>-11</sup>	4X10 <sup>-5</sup>	4X10 <sup>-13</sup>	1X10 <sup>-6</sup>	
		S	1X10 <sup>-11</sup>	4X10 <sup>-5</sup>	4X10 <sup>-13</sup>	1X10 <sup>-6</sup>	

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APPENDIX A

CONCENTRATIONS IN AIR AND WATER ABOVE NATURAL BACKGROUND

[See notes at end of appendix]

Element (atomic number)	Isotope <sup>1</sup>	Table I		Table II		
		Column 1 Air (uc/ml)	Column 2 Water (uc/ml)	Column 1 Air (uc/ml)	Column 2 Water (uc/ml)	
Dysprosium (66)	Cm 249	S	1X10 <sup>-5</sup>	6X10 <sup>-2</sup>	4X10 <sup>-7</sup>	2X10 <sup>-3</sup>
		I	1X10 <sup>-5</sup>	6X10 <sup>-2</sup>	4X10 <sup>-7</sup>	2X10 <sup>-3</sup>
	Dy 165	S	3X10 <sup>-6</sup>	1X10 <sup>-2</sup>	9X10 <sup>-8</sup>	4X10 <sup>-4</sup>
		I	2X10 <sup>-6</sup>	1X10 <sup>-2</sup>	7X10 <sup>-8</sup>	4X10 <sup>-4</sup>
Einsteinium (99)	Dy 166	S	2X10 <sup>-7</sup>	1X10 <sup>-3</sup>	8X10 <sup>-9</sup>	4X10 <sup>-5</sup>
		I	2X10 <sup>-7</sup>	1X10 <sup>-3</sup>	7X10 <sup>-9</sup>	4X10 <sup>-5</sup>
	Es 253	S	8X10 <sup>-10</sup>	7X10 <sup>-4</sup>	3X10 <sup>-11</sup>	2X10 <sup>-5</sup>
		I	6X10 <sup>-10</sup>	7X10 <sup>-4</sup>	2X10 <sup>-11</sup>	2X10 <sup>-5</sup>
Erbium (68)	Es 254 a	S	5X10 <sup>-9</sup>	5X10 <sup>-4</sup>	2X10 <sup>-10</sup>	2X10 <sup>-5</sup>
		I	6X10 <sup>-9</sup>	5X10 <sup>-4</sup>	2X10 <sup>-10</sup>	2X10 <sup>-5</sup>
	Es 254	S	2X10 <sup>-11</sup>	4X10 <sup>-4</sup>	6X10 <sup>-13</sup>	1X10 <sup>-5</sup>
		I	1X10 <sup>-10</sup>	4X10 <sup>-4</sup>	4X10 <sup>-12</sup>	1X10 <sup>-5</sup>
	Es 255	S	5X10 <sup>-10</sup>	8X10 <sup>-4</sup>	2X10 <sup>-11</sup>	3X10 <sup>-5</sup>
		I	4X10 <sup>-10</sup>	8X10 <sup>-4</sup>	1X10 <sup>-11</sup>	3X10 <sup>-5</sup>
Europium (63)	Er 169	S	6X10 <sup>-7</sup>	3X10 <sup>-3</sup>	2X10 <sup>-8</sup>	3X10 <sup>-5</sup>
		I	4X10 <sup>-7</sup>	3X10 <sup>-3</sup>	1X10 <sup>-8</sup>	3X10 <sup>-5</sup>
	Er 171	S	7X10 <sup>-7</sup>	3X10 <sup>-3</sup>	2X10 <sup>-8</sup>	1X10 <sup>-4</sup>
		I	6X10 <sup>-7</sup>	3X10 <sup>-3</sup>	2X10 <sup>-8</sup>	1X10 <sup>-4</sup>
Fermium (100)	Eu 152	S	4X10 <sup>-7</sup>	2X10 <sup>-3</sup>	1X10 <sup>-8</sup>	6X10 <sup>-5</sup>
	(T/2=9.2 hrs)	I	3X10 <sup>-7</sup>	2X10 <sup>-3</sup>	1X10 <sup>-8</sup>	6X10 <sup>-5</sup>
	Eu 152	S	1X10 <sup>-8</sup>	2X10 <sup>-3</sup>	4X10 <sup>-10</sup>	8X10 <sup>-5</sup>
	(T/2=13 yrs)	I	2X10 <sup>-8</sup>	2X10 <sup>-3</sup>	6X10 <sup>-10</sup>	8X10 <sup>-5</sup>
	Eu 154	S	4X10 <sup>-9</sup>	6X10 <sup>-4</sup>	1X10 <sup>-10</sup>	2X10 <sup>-5</sup>
		I	7X10 <sup>-9</sup>	6X10 <sup>-4</sup>	2X10 <sup>-10</sup>	2X10 <sup>-5</sup>
Fluorine (9)	Eu 155	S	9X10 <sup>-8</sup>	6X10 <sup>-3</sup>	3X10 <sup>-9</sup>	2X10 <sup>-4</sup>
		I	7X10 <sup>-8</sup>	6X10 <sup>-3</sup>	3X10 <sup>-9</sup>	2X10 <sup>-4</sup>
	Fm 254	S	6X10 <sup>-8</sup>	4X10 <sup>-3</sup>	2X10 <sup>-9</sup>	1X10 <sup>-4</sup>
		I	7X10 <sup>-8</sup>	4X10 <sup>-3</sup>	2X10 <sup>-9</sup>	1X10 <sup>-4</sup>
Gadolinium (64)	Fm 255	S	2X10 <sup>-8</sup>	1X10 <sup>-3</sup>	6X10 <sup>-10</sup>	3X10 <sup>-5</sup>
		I	1X10 <sup>-8</sup>	1X10 <sup>-3</sup>	4X10 <sup>-10</sup>	3X10 <sup>-5</sup>
	Fm 256	S	3X10 <sup>-9</sup>	3X10 <sup>-5</sup>	1X10 <sup>-10</sup>	9X10 <sup>-7</sup>
		I	2X10 <sup>-9</sup>	3X10 <sup>-5</sup>	6X10 <sup>-11</sup>	9X10 <sup>-7</sup>
Germanium (32)	F 18	S	5X10 <sup>-6</sup>	2X10 <sup>-2</sup>	2X10 <sup>-7</sup>	8X10 <sup>-4</sup>
		I	3X10 <sup>-6</sup>	1X10 <sup>-2</sup>	9X10 <sup>-8</sup>	5X10 <sup>-4</sup>
Gallium (31)	Gd 153	S	2X10 <sup>-7</sup>	6X10 <sup>-3</sup>	8X10 <sup>-9</sup>	2X10 <sup>-4</sup>
		I	9X10 <sup>-8</sup>	6X10 <sup>-3</sup>	3X10 <sup>-9</sup>	2X10 <sup>-4</sup>
Germanium (32)	Gd 159	S	5X10 <sup>-7</sup>	2X10 <sup>-3</sup>	2X10 <sup>-8</sup>	8X10 <sup>-5</sup>
		I	4X10 <sup>-7</sup>	2X10 <sup>-3</sup>	1X10 <sup>-8</sup>	8X10 <sup>-5</sup>
Germanium (32)	Ga 72	S	2X10 <sup>-7</sup>	1X10 <sup>-3</sup>	8X10 <sup>-9</sup>	4X10 <sup>-5</sup>
		I	2X10 <sup>-7</sup>	1X10 <sup>-3</sup>	6X10 <sup>-9</sup>	4X10 <sup>-5</sup>
Germanium (32)	Ge 71	S	1X10 <sup>-5</sup>	5X10 <sup>-2</sup>	4X10 <sup>-7</sup>	2X10 <sup>-3</sup>
		I	6X10 <sup>-6</sup>	5X10 <sup>-2</sup>	2X10 <sup>-7</sup>	2X10 <sup>-3</sup>

APPENDIX A

CONCENTRATIONS IN AIR AND WATER ABOVE NATURAL BACKGROUND

[See notes at end of appendix]

Element (atomic number)	Isotope <sup>1</sup>	Table I		Table II		
		Column 1 Air (uc/ml)	Column 2 Water (uc/ml)	Column 1 Air (uc/ml)	Column 2 Water (uc/ml)	
Gold (79)	Au 196	S	1X10 <sup>-6</sup>	5X10 <sup>-3</sup>	4X10 <sup>-8</sup>	2X10 <sup>-4</sup>
		I	6X10 <sup>-7</sup>	4X10 <sup>-3</sup>	2X10 <sup>-8</sup>	1X10 <sup>-4</sup>
	Au 198	S	3X10 <sup>-7</sup>	2X10 <sup>-3</sup>	1X10 <sup>-8</sup>	5X10 <sup>-5</sup>
		I	2X10 <sup>-7</sup>	1X10 <sup>-3</sup>	8X10 <sup>-9</sup>	5X10 <sup>-5</sup>
	Au 199	S	1X10 <sup>-6</sup>	5X10 <sup>-3</sup>	4X10 <sup>-8</sup>	2X10 <sup>-4</sup>
I		8X10 <sup>-7</sup>	4X10 <sup>-3</sup>	3X10 <sup>-8</sup>	2X10 <sup>-4</sup>	
Hafnium (72)	Hf 181	S	4X10 <sup>-8</sup>	2X10 <sup>-3</sup>	1X10 <sup>-9</sup>	7X10 <sup>-5</sup>
		I	7X10 <sup>-8</sup>	2X10 <sup>-3</sup>	3X10 <sup>-9</sup>	7X10 <sup>-5</sup>
Holmium (67)	Ho 166	S	2X10 <sup>-7</sup>	9X10 <sup>-4</sup>	7X10 <sup>-9</sup>	3X10 <sup>-5</sup>
		I	2X10 <sup>-7</sup>	9X10 <sup>-4</sup>	6X10 <sup>-9</sup>	3X10 <sup>-5</sup>
Hydrogen (1)	H 3	S	5X10 <sup>-6</sup>	1X10 <sup>-1</sup>	2X10 <sup>-7</sup>	3X10 <sup>-3</sup>
		I	5X10 <sup>-6</sup>	1X10 <sup>-1</sup>	2X10 <sup>-7</sup>	3X10 <sup>-3</sup>
		Sub	2X10 <sup>-6</sup>	-----	4X10 <sup>-5</sup>	-----
Indium (49)	In 113 m	S	8X10 <sup>-6</sup>	4X10 <sup>-2</sup>	3X10 <sup>-7</sup>	1X10 <sup>-3</sup>
		I	7X10 <sup>-6</sup>	4X10 <sup>-2</sup>	2X10 <sup>-7</sup>	1X10 <sup>-3</sup>
	In 114 m	S	1X10 <sup>-7</sup>	5X10 <sup>-4</sup>	4X10 <sup>-9</sup>	2X10 <sup>-5</sup>
		I	2X10 <sup>-7</sup>	5X10 <sup>-4</sup>	7X10 <sup>-10</sup>	2X10 <sup>-5</sup>
	In 115 m	S	2X10 <sup>-6</sup>	1X10 <sup>-2</sup>	8X10 <sup>-8</sup>	4X10 <sup>-4</sup>
		I	2X10 <sup>-6</sup>	1X10 <sup>-2</sup>	6X10 <sup>-8</sup>	4X10 <sup>-4</sup>
	In 115	S	2X10 <sup>-7</sup>	3X10 <sup>-3</sup>	9X10 <sup>-9</sup>	9X10 <sup>-5</sup>
		I	3X10 <sup>-8</sup>	3X10 <sup>-3</sup>	1X10 <sup>-9</sup>	9X10 <sup>-5</sup>
Iodine (53)	I 125	S	5X10 <sup>-9</sup>	4X10 <sup>-5</sup>	8X10 <sup>-11</sup>	2X10 <sup>-7</sup>
		I	2X10 <sup>-7</sup>	6X10 <sup>-3</sup>	6X10 <sup>-9</sup>	2X10 <sup>-4</sup>
	I 126	S	8X10 <sup>-9</sup>	5X10 <sup>-5</sup>	9X10 <sup>-11</sup>	3X10 <sup>-7</sup>
		I	3X10 <sup>-7</sup>	3X10 <sup>-3</sup>	1X10 <sup>-8</sup>	9X10 <sup>-5</sup>
	I 129	S	2X10 <sup>-9</sup>	1X10 <sup>-5</sup>	2X10 <sup>-11</sup>	6X10 <sup>-8</sup>
		I	7X10 <sup>-8</sup>	6X10 <sup>-3</sup>	2X10 <sup>-9</sup>	2X10 <sup>-4</sup>
	I 131	S	9X10 <sup>-9</sup>	6X10 <sup>-5</sup>	2X10 <sup>-10</sup>	2X10 <sup>-7</sup>
		I	3X10 <sup>-7</sup>	2X10 <sup>-3</sup>	1X10 <sup>-8</sup>	3X10 <sup>-5</sup>
	I 132	S	2X10 <sup>-7</sup>	2X10 <sup>-3</sup>	1X10 <sup>-9</sup>	6X10 <sup>-6</sup>
		I	9X10 <sup>-7</sup>	5X10 <sup>-3</sup>	3X10 <sup>-8</sup>	8X10 <sup>-4</sup>
	I 133	S	3X10 <sup>-8</sup>	2X10 <sup>-4</sup>	4X10 <sup>-10</sup>	2X10 <sup>-6</sup>
		I	2X10 <sup>-7</sup>	1X10 <sup>-3</sup>	7X10 <sup>-9</sup>	4X10 <sup>-5</sup>
	I 134	S	5X10 <sup>-7</sup>	4X10 <sup>-3</sup>	6X10 <sup>-9</sup>	2X10 <sup>-5</sup>
		I	3X10 <sup>-6</sup>	2X10 <sup>-2</sup>	1X10 <sup>-7</sup>	6X10 <sup>-4</sup>
		S	1X10 <sup>-7</sup>	7X10 <sup>-4</sup>	1X10 <sup>-9</sup>	4X10 <sup>-6</sup>
I 135	S	1X10 <sup>-7</sup>	7X10 <sup>-4</sup>	1X10 <sup>-8</sup>	4X10 <sup>-5</sup>	
	I	4X10 <sup>-7</sup>	2X10 <sup>-3</sup>	1X10 <sup>-8</sup>	7X10 <sup>-5</sup>	
	S	1X10 <sup>-6</sup>	6X10 <sup>-3</sup>	4X10 <sup>-8</sup>	2X10 <sup>-4</sup>	
Rodium (77)	Ir 190	S	1X10 <sup>-6</sup>	6X10 <sup>-3</sup>	4X10 <sup>-8</sup>	2X10 <sup>-4</sup>
		I	4X10 <sup>-7</sup>	5X10 <sup>-3</sup>	1X10 <sup>-9</sup>	2X10 <sup>-5</sup>
	Ir 192	S	1X10 <sup>-7</sup>	1X10 <sup>-3</sup>	4X10 <sup>-9</sup>	4X10 <sup>-5</sup>
I		3X10 <sup>-8</sup>	1X10 <sup>-3</sup>	9X10 <sup>-10</sup>	4X10 <sup>-5</sup>	



APPENDIX A

CONCENTRATIONS IN AIR AND WATER ABOVE NATURAL BACKGROUND

[See notes at end of appendix]

Element (atomic number)	Isotope <sup>1</sup>	Table I		Table II		
		Column 1 Air (uc/ml)	Column 2 Water (uc/ml)	Column 1 Air (uc/ml)	Column 2 Water (uc/ml)	
Iron (26)	Ir 194	S	2X10 <sup>-7</sup>	1X10 <sup>-3</sup>	8X10 <sup>-9</sup>	3X10 <sup>-5</sup>
		I	2X10 <sup>-7</sup>	9X10 <sup>-4</sup>	5X10 <sup>-9</sup>	3X10 <sup>-5</sup>
	Fe 55	S	9X10 <sup>-7</sup>	2X10 <sup>-2</sup>	3X10 <sup>-8</sup>	8X10 <sup>-4</sup>
		I	1X10 <sup>-6</sup>	7X10 <sup>-2</sup>	3X10 <sup>-8</sup>	2X10 <sup>-3</sup>
Krypton (36)	Fe 59	S	1X10 <sup>-7</sup>	2X10 <sup>-3</sup>	5X10 <sup>-9</sup>	6X10 <sup>-5</sup>
		I	5X10 <sup>-8</sup>	2X10 <sup>-3</sup>	2X10 <sup>-9</sup>	5X10 <sup>-5</sup>
	Kr 85 m	Sub	6X10 <sup>-6</sup>	-----	1X10 <sup>-7</sup>	-----
	Kr 85	Sub	1X10 <sup>-5</sup>	-----	3X10 <sup>-7</sup>	-----
Lanthanum (57)	Kr 87	Sub	1X10 <sup>-6</sup>	-----	2X10 <sup>-8</sup>	-----
	Kr 88	Sub	1X10 <sup>-6</sup>	-----	2X10 <sup>-8</sup>	-----
	La 140	S	2X10 <sup>-7</sup>	7X10 <sup>-4</sup>	5X10 <sup>-9</sup>	2X10 <sup>-5</sup>
		I	1X10 <sup>-7</sup>	7X10 <sup>-4</sup>	4X10 <sup>-9</sup>	2X10 <sup>-5</sup>
Lead (82)	Pb 203	S	3X10 <sup>-6</sup>	1X10 <sup>-2</sup>	9X10 <sup>-8</sup>	4X10 <sup>-4</sup>
		I	2X10 <sup>-6</sup>	1X10 <sup>-2</sup>	6X10 <sup>-8</sup>	4X10 <sup>-4</sup>
	Pb 210	S	1X10 <sup>-10</sup>	4X10 <sup>-6</sup>	4X10 <sup>-12</sup>	1X10 <sup>-7</sup>
		I	2X10 <sup>-10</sup>	5X10 <sup>-3</sup>	8X10 <sup>-12</sup>	2X10 <sup>-4</sup>
	Pb 212	S	2X10 <sup>-8</sup>	6X10 <sup>-4</sup>	6X10 <sup>-10</sup>	2X10 <sup>-5</sup>
		I	2X10 <sup>-8</sup>	5X10 <sup>-4</sup>	7X10 <sup>-10</sup>	2X10 <sup>-5</sup>
Lutetium (71)	Lu 177	S	6X10 <sup>-7</sup>	3X10 <sup>-3</sup>	2X10 <sup>-8</sup>	1X10 <sup>-4</sup>
		I	5X10 <sup>-7</sup>	3X10 <sup>-3</sup>	2X10 <sup>-8</sup>	1X10 <sup>-4</sup>
Manganese (25)	Mn 52	S	2X10 <sup>-7</sup>	1X10 <sup>-3</sup>	7X10 <sup>-9</sup>	3X10 <sup>-5</sup>
		I	1X10 <sup>-7</sup>	9X10 <sup>-4</sup>	5X10 <sup>-9</sup>	3X10 <sup>-5</sup>
	Mn 54	S	4X10 <sup>-7</sup>	4X10 <sup>-3</sup>	1X10 <sup>-9</sup>	1X10 <sup>-4</sup>
		I	4X10 <sup>-8</sup>	3X10 <sup>-3</sup>	1X10 <sup>-9</sup>	1X10 <sup>-4</sup>
Mercury (80)	Mn 56	S	8X10 <sup>-7</sup>	4X10 <sup>-3</sup>	3X10 <sup>-8</sup>	1X10 <sup>-4</sup>
		I	5X10 <sup>-7</sup>	3X10 <sup>-3</sup>	2X10 <sup>-8</sup>	1X10 <sup>-4</sup>
	Hg 197 m	S	7X10 <sup>-7</sup>	6X10 <sup>-3</sup>	3X10 <sup>-8</sup>	2X10 <sup>-4</sup>
		I	8X10 <sup>-7</sup>	5X10 <sup>-3</sup>	3X10 <sup>-8</sup>	2X10 <sup>-4</sup>
	Hg .97	S	1X10 <sup>-6</sup>	9X10 <sup>-3</sup>	4X10 <sup>-8</sup>	3X10 <sup>-4</sup>
		I	3X10 <sup>-6</sup>	1X10 <sup>-2</sup>	9X10 <sup>-8</sup>	5X10 <sup>-4</sup>
Molybdenum (42)	Hg 203	S	7X10 <sup>-8</sup>	5X10 <sup>-4</sup>	2X10 <sup>-9</sup>	2X10 <sup>-5</sup>
		I	1X10 <sup>-7</sup>	3X10 <sup>-3</sup>	4X10 <sup>-9</sup>	1X10 <sup>-4</sup>
	Mo 99	S	7X10 <sup>-7</sup>	5X10 <sup>-3</sup>	3X10 <sup>-8</sup>	2X10 <sup>-4</sup>
		I	2X10 <sup>-7</sup>	1X10 <sup>-3</sup>	7X10 <sup>-9</sup>	4X10 <sup>-5</sup>
Neodymium (60)	Nd 144	S	8X10 <sup>-11</sup>	2X10 <sup>-3</sup>	3X10 <sup>-12</sup>	7X10 <sup>-5</sup>
		I	3X10 <sup>-10</sup>	2X10 <sup>-3</sup>	1X10 <sup>-11</sup>	8X10 <sup>-5</sup>
	Nd 147	S	4X10 <sup>-7</sup>	2X10 <sup>-3</sup>	1X10 <sup>-8</sup>	6X10 <sup>-5</sup>
		I	2X10 <sup>-7</sup>	2X10 <sup>-3</sup>	8X10 <sup>-9</sup>	6X10 <sup>-5</sup>
	Nd 149	S	2X10 <sup>-6</sup>	8X10 <sup>-3</sup>	6X10 <sup>-8</sup>	3X10 <sup>-4</sup>
	I	1X10 <sup>-6</sup>	8X10 <sup>-3</sup>	5X10 <sup>-8</sup>	3X10 <sup>-4</sup>	

APPENDIX A

CONCENTRATIONS IN AIR AND WATER ABOVE NATURAL BACKGROUND

[See notes at end of appendix]

Element (atomic number)	Isotope <sup>1</sup>	Table I		Table II			
		Column 1 Air (uc/ml)	Column 2 Water (uc/ml)	Column 1 Air (uc/ml)	Column 2 Water (uc/ml)		
Neptunium (93)	Np 237	S	4X10 <sup>-12</sup>	9X10 <sup>-5</sup>	1X10 <sup>-13</sup>	3X10 <sup>-6</sup>	
		I	1X10 <sup>-10</sup>	9X10 <sup>-4</sup>	4X10 <sup>-12</sup>	3X10 <sup>-5</sup>	
	Np 239	S	8X10 <sup>-7</sup>	4X10 <sup>-3</sup>	3X10 <sup>-8</sup>	1X10 <sup>-4</sup>	
		I	7X10 <sup>-7</sup>	4X10 <sup>-3</sup>	2X10 <sup>-8</sup>	1X10 <sup>-4</sup>	
	Nickel (28)	Ni 59	S	5X10 <sup>-7</sup>	6X10 <sup>-3</sup>	2X10 <sup>-8</sup>	2X10 <sup>-4</sup>
			I	8X10 <sup>-7</sup>	6X10 <sup>-2</sup>	3X10 <sup>-8</sup>	2X10 <sup>-3</sup>
Ni 63		S	6X10 <sup>-8</sup>	8X10 <sup>-4</sup>	2X10 <sup>-9</sup>	3X10 <sup>-5</sup>	
		I	3X10 <sup>-7</sup>	2X10 <sup>-2</sup>	1X10 <sup>-8</sup>	7X10 <sup>-4</sup>	
Ni 65	S	9X10 <sup>-7</sup>	4X10 <sup>-3</sup>	3X10 <sup>-8</sup>	1X10 <sup>-4</sup>		
	I	5X10 <sup>-7</sup>	3X10 <sup>-3</sup>	2X10 <sup>-8</sup>	1X10 <sup>-4</sup>		
Niobium (Columbium) (41)	Nb 93 m	S	1X10 <sup>-7</sup>	1X10 <sup>-2</sup>	4X10 <sup>-9</sup>	4X10 <sup>-4</sup>	
		I	2X10 <sup>-7</sup>	1X10 <sup>-2</sup>	5X10 <sup>-9</sup>	4X10 <sup>-4</sup>	
	Nb 95	S	5X10 <sup>-7</sup>	3X10 <sup>-3</sup>	2X10 <sup>-8</sup>	1X10 <sup>-4</sup>	
		I	1X10 <sup>-7</sup>	3X10 <sup>-3</sup>	3X10 <sup>-9</sup>	1X10 <sup>-4</sup>	
	Nb 97	S	6X10 <sup>-6</sup>	3X10 <sup>-2</sup>	2X10 <sup>-7</sup>	9X10 <sup>-4</sup>	
		I	5X10 <sup>-6</sup>	3X10 <sup>-2</sup>	2X10 <sup>-7</sup>	9X10 <sup>-4</sup>	
Osmium (76)	Os 185	S	5X10 <sup>-7</sup>	2X10 <sup>-3</sup>	2X10 <sup>-8</sup>	7X10 <sup>-5</sup>	
		I	5X10 <sup>-8</sup>	2X10 <sup>-3</sup>	2X10 <sup>-9</sup>	7X10 <sup>-5</sup>	
	Os 191 m	S	2X10 <sup>-5</sup>	7X10 <sup>-2</sup>	6X10 <sup>-7</sup>	3X10 <sup>-3</sup>	
		I	9X10 <sup>-6</sup>	7X10 <sup>-2</sup>	3X10 <sup>-7</sup>	2X10 <sup>-3</sup>	
	Os 191	S	1X10 <sup>-6</sup>	5X10 <sup>-3</sup>	4X10 <sup>-8</sup>	2X10 <sup>-4</sup>	
		I	4X10 <sup>-7</sup>	5X10 <sup>-3</sup>	1X10 <sup>-8</sup>	2X10 <sup>-4</sup>	
Os 193	S	4X10 <sup>-7</sup>	2X10 <sup>-3</sup>	1X10 <sup>-8</sup>	6X10 <sup>-5</sup>		
	I	3X10 <sup>-7</sup>	2X10 <sup>-3</sup>	9X10 <sup>-9</sup>	5X10 <sup>-5</sup>		
Palladium (46)	Pd 103	S	1X10 <sup>-6</sup>	1X10 <sup>-2</sup>	5X10 <sup>-8</sup>	3X10 <sup>-4</sup>	
		I	7X10 <sup>-7</sup>	8X10 <sup>-3</sup>	3X10 <sup>-8</sup>	3X10 <sup>-4</sup>	
Pd 109	S	6X10 <sup>-7</sup>	3X10 <sup>-3</sup>	2X10 <sup>-8</sup>	9X10 <sup>-5</sup>		
	I	4X10 <sup>-7</sup>	2X10 <sup>-3</sup>	1X10 <sup>-8</sup>	7X10 <sup>-5</sup>		
Phosphorus (15)	P 32	S	7X10 <sup>-8</sup>	5X10 <sup>-4</sup>	2X10 <sup>-9</sup>	2X10 <sup>-5</sup>	
		I	8X10 <sup>-8</sup>	7X10 <sup>-4</sup>	3X10 <sup>-9</sup>	2X10 <sup>-5</sup>	
Platinum (78)	Pt 191	S	8X10 <sup>-7</sup>	4X10 <sup>-3</sup>	3X10 <sup>-8</sup>	1X10 <sup>-4</sup>	
		I	6X10 <sup>-7</sup>	3X10 <sup>-3</sup>	2X10 <sup>-8</sup>	1X10 <sup>-4</sup>	
	Pt 193	S	1x10 <sup>-6</sup>	3x10 <sup>-2</sup>	4x10 <sup>-8</sup>	9x10 <sup>-4</sup>	
		I	3x10 <sup>-7</sup>	5x10 <sup>-2</sup>	1x10 <sup>-8</sup>	2x10 <sup>-3</sup>	
	Pt 193m	S	7x10 <sup>-6</sup>	3x10 <sup>-2</sup>	2x10 <sup>-7</sup>	1x10 <sup>-3</sup>	
		I	5x10 <sup>-6</sup>	3x10 <sup>-2</sup>	2x10 <sup>-7</sup>	1x10 <sup>-3</sup>	
Pt 197m	S	6x10 <sup>-6</sup>	3x10 <sup>-2</sup>	2x10 <sup>-7</sup>	1x10 <sup>-3</sup>		
	I	5x10 <sup>-6</sup>	3x10 <sup>-2</sup>	2x10 <sup>-7</sup>	1x10 <sup>-3</sup>		
Pt 197	S	8x10 <sup>-7</sup>	4x10 <sup>-3</sup>	3x10 <sup>-8</sup>	1x10 <sup>-4</sup>		
	I	6x10 <sup>-7</sup>	3x10 <sup>-3</sup>	2x10 <sup>-8</sup>	1x10 <sup>-4</sup>		
Plutonium (94)	Pu 238	S	2x10 <sup>-12</sup>	1x10 <sup>-4</sup>	7x10 <sup>-14</sup>	5x10 <sup>-6</sup>	
		I	3x10 <sup>-11</sup>	8x10 <sup>-4</sup>	1x10 <sup>-12</sup>	3x10 <sup>-5</sup>	
	Pu 239	S	2x10 <sup>-12</sup>	1x10 <sup>-4</sup>	6x10 <sup>-14</sup>	5x10 <sup>-6</sup>	
		I	4x10 <sup>-11</sup>	8x10 <sup>-4</sup>	1x10 <sup>-12</sup>	3x10 <sup>-5</sup>	
Pu 240	S	2x10 <sup>-12</sup>	1x10 <sup>-4</sup>	6x10 <sup>-14</sup>	5x10 <sup>-6</sup>		

APPENDIX A

CONCENTRATIONS IN AIR AND WATER ABOVE NATURAL BACKGROUND

[See notes at end of appendix]

Element (atomic number)	Isotope <sup>1</sup>	Table I		Table II	
		Column 1	Column 2	Column 1	Column 2
		Air (uc/ml)	Water (uc/ml)	Air (uc/ml)	Water (uc/ml)
	Pu 241	I 4X10 <sup>-11</sup>	8X10 <sup>-4</sup>	1X10 <sup>-12</sup>	3X10 <sup>-5</sup>
		S 9X10 <sup>-11</sup>	7X10 <sup>-3</sup>	3X10 <sup>-12</sup>	2X10 <sup>-4</sup>
		I 4X10 <sup>-8</sup>	4X10 <sup>-2</sup>	1X10 <sup>-9</sup>	1X10 <sup>-3</sup>
	Pu 242	S 2X10 <sup>-12</sup>	1X10 <sup>-4</sup>	6X10 <sup>-14</sup>	5X10 <sup>-6</sup>
		I 4X10 <sup>-11</sup>	9X10 <sup>-4</sup>	1X10 <sup>-12</sup>	3X10 <sup>-5</sup>
	Pu 243	S 2X10 <sup>-6</sup>	1X10 <sup>-2</sup>	6X10 <sup>-8</sup>	3X10 <sup>-4</sup>
		I 2X10 <sup>-6</sup>	1X10 <sup>-2</sup>	8X10 <sup>-8</sup>	3X10 <sup>-4</sup>
	Pu 244	S 2X10 <sup>-12</sup>	1X10 <sup>-4</sup>	6X10 <sup>-14</sup>	4X10 <sup>-6</sup>
		I 3X10 <sup>-11</sup>	3X10 <sup>-4</sup>	1X10 <sup>-12</sup>	1X10 <sup>-5</sup>
Polonium (84)	Po 210	S 5X10 <sup>-10</sup>	2X10 <sup>-5</sup>	2X10 <sup>-11</sup>	7X10 <sup>-7</sup>
		I 2X10 <sup>-10</sup>	8X10 <sup>-4</sup>	7X10 <sup>-12</sup>	3X10 <sup>-5</sup>
Potassium (19)	K 42	S 2X10 <sup>-6</sup>	9X10 <sup>-3</sup>	7X10 <sup>-8</sup>	3X10 <sup>-4</sup>
		I 1X10 <sup>-7</sup>	6X10 <sup>-4</sup>	4X10 <sup>-9</sup>	2X10 <sup>-5</sup>
Praseodymium (59)	Pr 142	S 2X10 <sup>-7</sup>	9X10 <sup>-4</sup>	7X10 <sup>-9</sup>	3X10 <sup>-5</sup>
		I 2X10 <sup>-7</sup>	9X10 <sup>-4</sup>	5X10 <sup>-9</sup>	3X10 <sup>-5</sup>
	Pr 143	S 3X10 <sup>-7</sup>	1X10 <sup>-3</sup>	1X10 <sup>-8</sup>	5X10 <sup>-5</sup>
		I 2X10 <sup>-7</sup>	1X10 <sup>-3</sup>	6X10 <sup>-9</sup>	5X10 <sup>-5</sup>
Promethium (61)	Pm 147	S 6X10 <sup>-8</sup>	6X10 <sup>-3</sup>	2X10 <sup>-9</sup>	2X10 <sup>-4</sup>
		I 1X10 <sup>-7</sup>	6X10 <sup>-3</sup>	3X10 <sup>-9</sup>	2X10 <sup>-4</sup>
	Pm 149	S 3X10 <sup>-7</sup>	1X10 <sup>-3</sup>	1X10 <sup>-8</sup>	4X10 <sup>-5</sup>
		I 2X10 <sup>-7</sup>	1X10 <sup>-3</sup>	8X10 <sup>-9</sup>	4X10 <sup>-5</sup>
Protoactinium (91)	Pa 230	S 2X10 <sup>-9</sup>	7X10 <sup>-3</sup>	6X10 <sup>-11</sup>	2X10 <sup>-4</sup>
		I 8X10 <sup>-10</sup>	7X10 <sup>-3</sup>	3X10 <sup>-11</sup>	2X10 <sup>-4</sup>
	Pa 231	S 1X10 <sup>-12</sup>	3X10 <sup>-5</sup>	4X10 <sup>-14</sup>	9X10 <sup>-6</sup>
		I 1X10 <sup>-10</sup>	8X10 <sup>-4</sup>	4X10 <sup>-12</sup>	2X10 <sup>-5</sup>
	Pa 233	S 6X10 <sup>-7</sup>	4X10 <sup>-3</sup>	2X10 <sup>-8</sup>	1X10 <sup>-4</sup>
		I 2X10 <sup>-7</sup>	3X10 <sup>-3</sup>	2X10 <sup>-9</sup>	1X10 <sup>-4</sup>
Radium (88)	Ra 223	S 2X10 <sup>-9</sup>	2X10 <sup>-5</sup>	6X10 <sup>-11</sup>	1X10 <sup>-7</sup>
		I 2X10 <sup>-10</sup>	1X10 <sup>-4</sup>	8X10 <sup>-12</sup>	7X10 <sup>-6</sup>
	Ra 224	S 5X10 <sup>-9</sup>	7X10 <sup>-5</sup>	2X10 <sup>-10</sup>	2X10 <sup>-6</sup>
		I 7X10 <sup>-10</sup>	2X10 <sup>-4</sup>	2X10 <sup>-11</sup>	5X10 <sup>-6</sup>
	Ra 226	S 3X10 <sup>-11</sup>	4X10 <sup>-7</sup>	3X10 <sup>-12</sup>	3X10 <sup>-8</sup>
		I 5X10 <sup>-11</sup>	9X10 <sup>-4</sup>	2X10 <sup>-12</sup>	3X10 <sup>-5</sup>
	Ra 228	S 7X10 <sup>-11</sup>	8X10 <sup>-7</sup>	2X10 <sup>-12</sup>	3X10 <sup>-8</sup>
		I 4X10 <sup>-11</sup>	7X10 <sup>-4</sup>	1X10 <sup>-12</sup>	3X10 <sup>-5</sup>
Radon (86)	Rn 220	S 3X10 <sup>-7</sup>	-----	1X10 <sup>-8</sup>	-----
		I -----	-----	-----	-----
	Rn 222 <sup>3/</sup>	S 3X10 <sup>-8</sup>	-----	3X10 <sup>-9</sup>	-----
Rhenium (75)	Re 183	S 3X10 <sup>-6</sup>	2X10 <sup>-2</sup>	9X10 <sup>-8</sup>	6X10 <sup>-4</sup>
		I 2X10 <sup>-7</sup>	8X10 <sup>-3</sup>	5X10 <sup>-9</sup>	3X10 <sup>-4</sup>
	Re 186	S 6X10 <sup>-7</sup>	3X10 <sup>-3</sup>	2X10 <sup>-8</sup>	9X10 <sup>-5</sup>
		I 2X10 <sup>-7</sup>	1X10 <sup>-3</sup>	8X10 <sup>-9</sup>	5X10 <sup>-5</sup>

APPENDIX A

CONCENTRATIONS IN AIR AND WATER ABOVE NATURAL BACKGROUND

[See notes at end of appendix]

Element (number)	Isotope <sup>1</sup>	Table I		Table II		
		Column 1	Column 2	Column 1	Column 2	
		Air (uc/ml)	Water (uc/ml)	Air (uc/ml)	Water (uc/ml)	
	Re 187	S	9X10 <sup>-6</sup>	7X10 <sup>-2</sup>	3X10 <sup>-7</sup>	3X10 <sup>-3</sup>
		I	5X10 <sup>-7</sup>	4X10 <sup>-2</sup>	2X10 <sup>-8</sup>	2X10 <sup>-3</sup>
	Re 188	S	4X10 <sup>-7</sup>	2X10 <sup>-3</sup>	1X10 <sup>-8</sup>	6X10 <sup>-5</sup>
		I	2X10 <sup>-7</sup>	9X10 <sup>-4</sup>	6X10 <sup>-9</sup>	3X10 <sup>-5</sup>
Rhodium (45)	Rh 103 m	S	8X10 <sup>-5</sup>	4X10 <sup>-1</sup>	3X10 <sup>-6</sup>	1X10 <sup>-2</sup>
		I	6X10 <sup>-5</sup>	3X10 <sup>-1</sup>	2X10 <sup>-6</sup>	1X10 <sup>-2</sup>
	Rh 105	S	8X10 <sup>-7</sup>	4X10 <sup>-3</sup>	3X10 <sup>-8</sup>	1X10 <sup>-4</sup>
		I	5X10 <sup>-7</sup>	3X10 <sup>-3</sup>	2X10 <sup>-8</sup>	1X10 <sup>-4</sup>
Rubidium (37)	Rb 86	S	3X10 <sup>-7</sup>	2X10 <sup>-3</sup>	1X10 <sup>-8</sup>	7X10 <sup>-5</sup>
		I	7X10 <sup>-8</sup>	7X10 <sup>-4</sup>	2X10 <sup>-9</sup>	2X10 <sup>-5</sup>
	Rb 87	S	5X10 <sup>-7</sup>	3X10 <sup>-3</sup>	2X10 <sup>-8</sup>	1X10 <sup>-4</sup>
		I	7X10 <sup>-8</sup>	5X10 <sup>-3</sup>	2X10 <sup>-9</sup>	2X10 <sup>-4</sup>
Ruthenium (44)	Ru 97	S	2X10 <sup>-6</sup>	1X10 <sup>-2</sup>	8X10 <sup>-8</sup>	4X10 <sup>-4</sup>
		I	2X10 <sup>-6</sup>	1X10 <sup>-2</sup>	6X10 <sup>-8</sup>	3X10 <sup>-4</sup>
	Ru 103	S	5X10 <sup>-7</sup>	2X10 <sup>-3</sup>	2X10 <sup>-8</sup>	8X10 <sup>-5</sup>
		I	8X10 <sup>-8</sup>	2X10 <sup>-3</sup>	3X10 <sup>-9</sup>	8X10 <sup>-5</sup>
	Ru 105	S	7X10 <sup>-7</sup>	3X10 <sup>-3</sup>	2X10 <sup>-8</sup>	1X10 <sup>-4</sup>
		I	5X10 <sup>-7</sup>	3X10 <sup>-3</sup>	2X10 <sup>-8</sup>	1X10 <sup>-4</sup>
	Ru 106	S	8X10 <sup>-8</sup>	4X10 <sup>-4</sup>	3X10 <sup>-9</sup>	1X10 <sup>-5</sup>
		I	6X10 <sup>-9</sup>	3X10 <sup>-4</sup>	2X10 <sup>-10</sup>	1X10 <sup>-5</sup>
Samarium (62)	Sm 147	S	7X10 <sup>-11</sup>	2X10 <sup>-3</sup>	2X10 <sup>-12</sup>	6X10 <sup>-5</sup>
		I	3X10 <sup>-10</sup>	2X10 <sup>-3</sup>	9X10 <sup>-12</sup>	7X10 <sup>-5</sup>
	Sm 151	S	6X10 <sup>-8</sup>	1X10 <sup>-2</sup>	2X10 <sup>-9</sup>	4X10 <sup>-4</sup>
		I	1X10 <sup>-7</sup>	1X10 <sup>-2</sup>	5X10 <sup>-9</sup>	4X10 <sup>-4</sup>
	Sm 153	S	5X10 <sup>-7</sup>	2X10 <sup>-3</sup>	2X10 <sup>-8</sup>	8X10 <sup>-5</sup>
		I	4X10 <sup>-7</sup>	2X10 <sup>-3</sup>	1X10 <sup>-8</sup>	8X10 <sup>-5</sup>
Scandium (21)	Sc 46	S	2X10 <sup>-7</sup>	1X10 <sup>-3</sup>	8X10 <sup>-9</sup>	4X10 <sup>-5</sup>
		I	2X10 <sup>-8</sup>	1X10 <sup>-3</sup>	8X10 <sup>-10</sup>	4X10 <sup>-5</sup>
	Sc 47	S	6X10 <sup>-7</sup>	3X10 <sup>-3</sup>	2X10 <sup>-8</sup>	9X10 <sup>-5</sup>
		I	5X10 <sup>-7</sup>	3X10 <sup>-3</sup>	2X10 <sup>-8</sup>	9X10 <sup>-5</sup>
	Sc 48	S	2X10 <sup>-7</sup>	8X10 <sup>-4</sup>	6X10 <sup>-9</sup>	3X10 <sup>-5</sup>
		I	1X10 <sup>-7</sup>	8X10 <sup>-4</sup>	5X10 <sup>-9</sup>	3X10 <sup>-5</sup>
Selenium (34)	Se 75	S	1X10 <sup>-6</sup>	9X10 <sup>-3</sup>	4X10 <sup>-8</sup>	3X10 <sup>-4</sup>
		I	1X10 <sup>-7</sup>	8X10 <sup>-3</sup>	4X10 <sup>-9</sup>	3X10 <sup>-4</sup>
		S	6X10 <sup>-6</sup>	3X10 <sup>-3</sup>	2X10 <sup>-7</sup>	9X10 <sup>-4</sup>
Silicon (14)	Si 31	S	1X10 <sup>-6</sup>	6X10 <sup>-3</sup>	3X10 <sup>-8</sup>	2X10 <sup>-4</sup>
Silver (47)	Ag 105	S	6X10 <sup>-8</sup>	3X10 <sup>-3</sup>	2X10 <sup>-9</sup>	1X10 <sup>-4</sup>
		I	8X10 <sup>-7</sup>	3X10 <sup>-4</sup>	3X10 <sup>-9</sup>	1X10 <sup>-5</sup>
	Ag 110 m	S	2X10 <sup>-8</sup>	9X10 <sup>-4</sup>	7X10 <sup>-9</sup>	3X10 <sup>-5</sup>
		I	1X10 <sup>-8</sup>	9X10 <sup>-4</sup>	3X10 <sup>-10</sup>	3X10 <sup>-5</sup>
	Ag 111	S	3X10 <sup>-7</sup>	1X10 <sup>-3</sup>	1X10 <sup>-8</sup>	4X10 <sup>-5</sup>
		I	2X10 <sup>-7</sup>	1X10 <sup>-3</sup>	8X10 <sup>-9</sup>	4X10 <sup>-5</sup>
Sodium (11)	Na 22	S	2X10 <sup>-9</sup>	1X10 <sup>-3</sup>	6X10 <sup>-9</sup>	4X10 <sup>-5</sup>
		I	9X10 <sup>-9</sup>	9X10 <sup>-4</sup>	3X10 <sup>-10</sup>	3X10 <sup>-5</sup>
	Na 24	S	1X10 <sup>-6</sup>	6X10 <sup>-3</sup>	4X10 <sup>-8</sup>	2X10 <sup>-4</sup>

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APPENDIX A

CONCENTRATIONS IN AIR AND WATER ABOVE NATURAL BACKGROUND

[See notes at end of appendix]

Element (atomic number)	Isotope <sup>1</sup>	Table I		Table II		
		Column 1 Air (uc/ml)	Column 2 Water (uc/ml)	Column 1 Air (uc/ml)	Column 2 Water (uc/ml)	
Strontium (38)	Sr 85 m	I	1X10 <sup>-7</sup>	8X10 <sup>-4</sup>	5X10 <sup>-9</sup>	3X10 <sup>-5</sup>
		S	4X10 <sup>-5</sup>	2X10 <sup>-1</sup>	1X10 <sup>-6</sup>	7X10 <sup>-3</sup>
	Sr 85	I	3X10 <sup>-5</sup>	2X10 <sup>-1</sup>	1X10 <sup>-6</sup>	7X10 <sup>-3</sup>
		S	2X10 <sup>-7</sup>	3X10 <sup>-3</sup>	8X10 <sup>-9</sup>	1X10 <sup>-4</sup>
	Sr 89	I	1X10 <sup>-7</sup>	5X10 <sup>-3</sup>	4X10 <sup>-9</sup>	2X10 <sup>-4</sup>
		S	3X10 <sup>-8</sup>	3X10 <sup>-4</sup>	3X10 <sup>-10</sup>	3X10 <sup>-6</sup>
	Sr 90	I	4X10 <sup>-8</sup>	8X10 <sup>-4</sup>	1X10 <sup>-9</sup>	3X10 <sup>-5</sup>
		S	1X10 <sup>-9</sup>	1X10 <sup>-5</sup>	3X10 <sup>-11</sup>	3X10 <sup>-7</sup>
	Sr 91	I	5X10 <sup>-9</sup>	1X10 <sup>-3</sup>	2X10 <sup>-10</sup>	5X10 <sup>-5</sup>
		S	4X10 <sup>-7</sup>	2X10 <sup>-3</sup>	2X10 <sup>-8</sup>	7X10 <sup>-3</sup>
	Sr 92	I	3X10 <sup>-7</sup>	1X10 <sup>-3</sup>	9X10 <sup>-9</sup>	5X10 <sup>-5</sup>
		S	4X10 <sup>-7</sup>	2X10 <sup>-3</sup>	2X10 <sup>-8</sup>	7X10 <sup>-5</sup>
Sulfur (16)	S 35	I	3X10 <sup>-7</sup>	2X10 <sup>-3</sup>	1X10 <sup>-8</sup>	6X10 <sup>-3</sup>
		S	3X10 <sup>-7</sup>	2X10 <sup>-3</sup>	9X10 <sup>-9</sup>	6X10 <sup>-3</sup>
Tantalum (73)	Ta 182	I	3X10 <sup>-7</sup>	8X10 <sup>-3</sup>	9X10 <sup>-9</sup>	3X10 <sup>-4</sup>
		S	4X10 <sup>-8</sup>	1X10 <sup>-3</sup>	1X10 <sup>-9</sup>	4X10 <sup>-5</sup>
Technetium (43)	Tc 96 m	I	2X10 <sup>-8</sup>	1X10 <sup>-3</sup>	7X10 <sup>-10</sup>	4X10 <sup>-5</sup>
		S	8X10 <sup>-5</sup>	4X10 <sup>-1</sup>	3X10 <sup>-6</sup>	1X10 <sup>-2</sup>
	Tc 96	I	3X10 <sup>-5</sup>	3X10 <sup>-1</sup>	1X10 <sup>-6</sup>	1X10 <sup>-2</sup>
		S	6X10 <sup>-7</sup>	3X10 <sup>-3</sup>	2X10 <sup>-8</sup>	1X10 <sup>-4</sup>
	Tc 97 m	I	2X10 <sup>-7</sup>	1X10 <sup>-3</sup>	8X10 <sup>-9</sup>	5X10 <sup>-5</sup>
		S	2X10 <sup>-6</sup>	1X10 <sup>-2</sup>	8X10 <sup>-8</sup>	4X10 <sup>-4</sup>
	Tc 97	I	2X10 <sup>-7</sup>	5X10 <sup>-3</sup>	5X10 <sup>-9</sup>	2X10 <sup>-4</sup>
		S	1X10 <sup>-5</sup>	5X10 <sup>-2</sup>	4X10 <sup>-7</sup>	2X10 <sup>-3</sup>
	Tc 99 m	I	3X10 <sup>-7</sup>	2X10 <sup>-2</sup>	1X10 <sup>-8</sup>	8X10 <sup>-4</sup>
		S	4X10 <sup>-5</sup>	2X10 <sup>-1</sup>	1X10 <sup>-6</sup>	6X10 <sup>-3</sup>
	Tc 99	I	1X10 <sup>-5</sup>	8X10 <sup>-2</sup>	5X10 <sup>-7</sup>	3X10 <sup>-3</sup>
		S	2X10 <sup>-6</sup>	1X10 <sup>-2</sup>	7X10 <sup>-8</sup>	3X10 <sup>-4</sup>
Tellurium (52)	Te 125 m	I	6X10 <sup>-8</sup>	5X10 <sup>-3</sup>	2X10 <sup>-9</sup>	2X10 <sup>-4</sup>
		S	4X10 <sup>-7</sup>	5X10 <sup>-3</sup>	1X10 <sup>-8</sup>	2X10 <sup>-4</sup>
	Te 127 m	I	1X10 <sup>-7</sup>	3X10 <sup>-3</sup>	4X10 <sup>-9</sup>	1X10 <sup>-4</sup>
		S	1X10 <sup>-7</sup>	2X10 <sup>-3</sup>	5X10 <sup>-9</sup>	9X10 <sup>-5</sup>
	Te 127	I	4X10 <sup>-8</sup>	2X10 <sup>-3</sup>	1X10 <sup>-9</sup>	5X10 <sup>-5</sup>
		S	2X10 <sup>-6</sup>	8X10 <sup>-3</sup>	6X10 <sup>-8</sup>	5X10 <sup>-4</sup>
	Te 129 m	I	9X10 <sup>-7</sup>	5X10 <sup>-3</sup>	3X10 <sup>-8</sup>	2X10 <sup>-4</sup>
		S	8X10 <sup>-8</sup>	1X10 <sup>-3</sup>	3X10 <sup>-9</sup>	5X10 <sup>-5</sup>
	Te 129	I	3X10 <sup>-8</sup>	6X10 <sup>-4</sup>	1X10 <sup>-9</sup>	2X10 <sup>-5</sup>
		S	5X10 <sup>-6</sup>	2X10 <sup>-2</sup>	2X10 <sup>-7</sup>	5X10 <sup>-4</sup>
	Te 131 m	I	4X10 <sup>-6</sup>	2X10 <sup>-2</sup>	1X10 <sup>-7</sup>	5X10 <sup>-4</sup>
		S	4X10 <sup>-7</sup>	2X10 <sup>-3</sup>	1X10 <sup>-8</sup>	6X10 <sup>-5</sup>
		I	2X10 <sup>-7</sup>	1X10 <sup>-3</sup>	6X10 <sup>-9</sup>	4X10 <sup>-5</sup>

APPENDIX A

CONCENTRATIONS IN AIR AND WATER ABOVE NATURAL BACKGROUND

(See notes at end of appendix)

(Element (atomic number))	Isotope	Table I		Table II		
		Column 1 Air (uc/ml)	Column 2 Water (uc/ml)	Column 1 Air (uc/ml)	Column 2 Water (uc/ml)	
	Te 132	S	2x10 <sup>-7</sup>	9x10 <sup>-4</sup>	7x10 <sup>-9</sup>	3x10 <sup>-5</sup>
		I	1x10 <sup>-7</sup>	6x10 <sup>-4</sup>	4x10 <sup>-9</sup>	2x10 <sup>-5</sup>
Terbium (65)	Tb 160	S	1x10 <sup>-7</sup>	1x10 <sup>-3</sup>	3x10 <sup>-9</sup>	4x10 <sup>-5</sup>
		I	3x10 <sup>-8</sup>	1x10 <sup>-3</sup>	1x10 <sup>-9</sup>	4x10 <sup>-5</sup>
Tellurium (81)	Tl 200	S	3x10 <sup>-6</sup>	1x10 <sup>-2</sup>	9x10 <sup>-8</sup>	4x10 <sup>-4</sup>
		I	1x10 <sup>-6</sup>	7x10 <sup>-3</sup>	4x10 <sup>-8</sup>	2x10 <sup>-4</sup>
	Tl 201	S	2x10 <sup>-6</sup>	9x10 <sup>-3</sup>	7x10 <sup>-8</sup>	3x10 <sup>-4</sup>
		I	9x10 <sup>-7</sup>	5x10 <sup>-3</sup>	3x10 <sup>-8</sup>	2x10 <sup>-4</sup>
	Tl 202	S	8x10 <sup>-7</sup>	4x10 <sup>-3</sup>	3x10 <sup>-8</sup>	1x10 <sup>-4</sup>
		I	2x10 <sup>-7</sup>	2x10 <sup>-3</sup>	8x10 <sup>-9</sup>	7x10 <sup>-5</sup>
	Tl 204	S	6x10 <sup>-7</sup>	3x10 <sup>-3</sup>	2x10 <sup>-8</sup>	1x10 <sup>-4</sup>
		I	3x10 <sup>-8</sup>	2x10 <sup>-3</sup>	9x10 <sup>-10</sup>	5x10 <sup>-5</sup>
Thorium (90)	Th 227	S	3x10 <sup>-10</sup>	5x10 <sup>-4</sup>	1x10 <sup>-11</sup>	2x10 <sup>-5</sup>
		I	2x10 <sup>-10</sup>	5x10 <sup>-4</sup>	6x10 <sup>-12</sup>	2x10 <sup>-5</sup>
	Th 228	S	9x10 <sup>-12</sup>	2x10 <sup>-4</sup>	3x10 <sup>-13</sup>	7x10 <sup>-6</sup>
		I	6x10 <sup>-12</sup>	4x10 <sup>-4</sup>	2x10 <sup>-13</sup>	1x10 <sup>-5</sup>
	Th 230	S	2x10 <sup>-12</sup>	5x10 <sup>-5</sup>	8x10 <sup>-14</sup>	2x10 <sup>-6</sup>
		I	1x10 <sup>-11</sup>	9x10 <sup>-4</sup>	3x10 <sup>-13</sup>	3x10 <sup>-5</sup>
	Th 231	S	1x10 <sup>-6</sup>	7x10 <sup>-3</sup>	5x10 <sup>-8</sup>	2x10 <sup>-4</sup>
		I	1x10 <sup>-6</sup>	7x10 <sup>-3</sup>	4x10 <sup>-8</sup>	2x10 <sup>-4</sup>
	Th 232	S	3x10 <sup>-11</sup>	5x10 <sup>-5</sup>	1x10 <sup>-12</sup>	2x10 <sup>-6</sup>
		I	3x10 <sup>-11</sup>	1x10 <sup>-3</sup>	1x10 <sup>-12</sup>	4x10 <sup>-5</sup>
	Th natural	S	6x10 <sup>-11</sup>	8x10 <sup>-5</sup>	2x10 <sup>-12</sup>	2x10 <sup>-6</sup>
		I	6x10 <sup>-11</sup>	6x10 <sup>-4</sup>	2x10 <sup>-12</sup>	2x10 <sup>-5</sup>
	Th 234	S	6x10 <sup>-8</sup>	5x10 <sup>-4</sup>	2x10 <sup>-9</sup>	2x10 <sup>-5</sup>
		I	3x10 <sup>-8</sup>	5x10 <sup>-4</sup>	1x10 <sup>-9</sup>	2x10 <sup>-5</sup>
Thulium	Tm 170	S	4x10 <sup>-8</sup>	1x10 <sup>-3</sup>	1x10 <sup>-9</sup>	5x10 <sup>-5</sup>
		I	3x10 <sup>-8</sup>	1x10 <sup>-3</sup>	1x10 <sup>-9</sup>	5x10 <sup>-5</sup>
	Tm 171	S	1x10 <sup>-7</sup>	1x10 <sup>-2</sup>	4x10 <sup>-9</sup>	5x10 <sup>-4</sup>
		I	2x10 <sup>-7</sup>	1x10 <sup>-2</sup>	8x10 <sup>-9</sup>	5x10 <sup>-4</sup>
Tin (50)	Sn 113	S	4x10 <sup>-7</sup>	2x10 <sup>-3</sup>	1x10 <sup>-8</sup>	9x10 <sup>-5</sup>
		I	5x10 <sup>-8</sup>	2x10 <sup>-3</sup>	2x10 <sup>-9</sup>	8x10 <sup>-5</sup>
	Sn 125	S	1x10 <sup>-7</sup>	5x10 <sup>-4</sup>	4x10 <sup>-9</sup>	2x10 <sup>-5</sup>
		I	8x10 <sup>-8</sup>	5x10 <sup>-4</sup>	3x10 <sup>-9</sup>	2x10 <sup>-5</sup>
Tungsten (Wolfram) (74)	W 181	S	2x10 <sup>-6</sup>	1x10 <sup>-2</sup>	8x10 <sup>-8</sup>	4x10 <sup>-4</sup>
		I	1x10 <sup>-7</sup>	1x10 <sup>-2</sup>	4x10 <sup>-9</sup>	3x10 <sup>-4</sup>
	W 185	S	8x10 <sup>-7</sup>	4x10 <sup>-3</sup>	3x10 <sup>-8</sup>	1x10 <sup>-4</sup>
		I	1x10 <sup>-7</sup>	3x10 <sup>-3</sup>	4x10 <sup>-9</sup>	1x10 <sup>-4</sup>
	W 187	S	4x10 <sup>-7</sup>	2x10 <sup>-3</sup>	2x10 <sup>-8</sup>	7x10 <sup>-5</sup>
		I	3x10 <sup>-7</sup>	2x10 <sup>-3</sup>	1x10 <sup>-8</sup>	6x10 <sup>-5</sup>
Uranium (92)	U 230	S	3x10 <sup>-10</sup>	1x10 <sup>-4</sup>	1x10 <sup>-11</sup>	5x10 <sup>-6</sup>
		I	1x10 <sup>-10</sup>	1x10 <sup>-4</sup>	4x10 <sup>-12</sup>	5x10 <sup>-6</sup>
	U 232	S	1x10 <sup>-10</sup>	8x10 <sup>-4</sup>	3x10 <sup>-2</sup>	3x10 <sup>-5</sup>
		I	3x10 <sup>-11</sup>	8x10 <sup>-4</sup>	9x10 <sup>-13</sup>	3x10 <sup>-5</sup>
	U 233	S	5x10 <sup>-10</sup>	9x10 <sup>-4</sup>	2x10 <sup>-11</sup>	3x10 <sup>-5</sup>

APPENDIX A

CONCENTRATIONS IN AIR AND WATER ABOVE NATURAL BACKGROUND

[See notes at end of appendix]

Element (atomic number)	Isotope <sup>1</sup>	Table I		Table II		
		Column 1 Air (uc/ml)	Column 2 Water (uc/ml)	Column 1 Air (uc/ml)	Column 2 Water (uc/ml)	
Uranium	U 234	I	1X10 <sup>-10</sup>	9X10 <sup>-4</sup>	4X10 <sup>-12</sup>	3X10 <sup>-5</sup>
		S IF	6X10 <sup>-10</sup>	9X10 <sup>-4</sup>	2X10 <sup>-11</sup>	5X10 <sup>-5</sup>
	U 235	I	1X10 <sup>-10</sup>	9X10 <sup>-4</sup>	4X10 <sup>-12</sup>	3X10 <sup>-5</sup>
		S IF	5X10 <sup>-10</sup>	8X10 <sup>-4</sup>	2X10 <sup>-11</sup>	3X10 <sup>-5</sup>
	U 236	I	1X10 <sup>-10</sup>	8X10 <sup>-4</sup>	4X10 <sup>-12</sup>	3X10 <sup>-5</sup>
		S	6X10 <sup>-10</sup>	1X10 <sup>-3</sup>	2X10 <sup>-11</sup>	3X10 <sup>-5</sup>
	U 238	I	1X10 <sup>-10</sup>	1X10 <sup>-3</sup>	4X10 <sup>-12</sup>	3X10 <sup>-5</sup>
		S IF	7X10 <sup>-11</sup>	1X10 <sup>-3</sup>	3X10 <sup>-12</sup>	4X10 <sup>-5</sup>
	U 240	I	1X10 <sup>-10</sup>	1X10 <sup>-3</sup>	5X10 <sup>-12</sup>	4X10 <sup>-5</sup>
		S	2X10 <sup>-7</sup>	1X10 <sup>-3</sup>	8X10 <sup>-9</sup>	3X10 <sup>-5</sup>
	U natural	I	2X10 <sup>-7</sup>	1X10 <sup>-3</sup>	6X10 <sup>-9</sup>	3X10 <sup>-5</sup>
		S IF	1X10 <sup>-10</sup>	1X10 <sup>-3</sup>	5X10 <sup>-12</sup>	3X10 <sup>-5</sup>
Vanadium (23)	V 48	I	1X10 <sup>-7</sup>	1X10 <sup>-3</sup>	5X10 <sup>-12</sup>	3X10 <sup>-5</sup>
		S	2X10 <sup>-8</sup>	9X10 <sup>-4</sup>	6X10 <sup>-9</sup>	3X10 <sup>-5</sup>
Xenon (54)	Xe 131 m	I	6X10 <sup>-5</sup>	8X10 <sup>-4</sup>	2X10 <sup>-7</sup>	3X10 <sup>-5</sup>
		Sub	2X10 <sup>-5</sup>	-----	4X10 <sup>-7</sup>	-----
		Sub	1X10 <sup>-5</sup>	-----	3X10 <sup>-7</sup>	-----
		Sub	1X10 <sup>-5</sup>	-----	3X10 <sup>-7</sup>	-----
Ytterbium (70)	Yb 175	I	4X10 <sup>-6</sup>	-----	1X10 <sup>-7</sup>	-----
		S	7X10 <sup>-7</sup>	3X10 <sup>-3</sup>	2X10 <sup>-8</sup>	1X10 <sup>-4</sup>
Yttrium (39)	Y 90	I	6X10 <sup>-7</sup>	3X10 <sup>-3</sup>	2X10 <sup>-8</sup>	1X10 <sup>-4</sup>
		S	1X10 <sup>-7</sup>	6X10 <sup>-4</sup>	4X10 <sup>-9</sup>	2X10 <sup>-5</sup>
	Y 91 m	I	1X10 <sup>-7</sup>	6X10 <sup>-4</sup>	3X10 <sup>-9</sup>	2X10 <sup>-5</sup>
		S	2X10 <sup>-5</sup>	1X10 <sup>-1</sup>	8X10 <sup>-7</sup>	3X10 <sup>-3</sup>
	Y 91	I	2X10 <sup>-5</sup>	1X10 <sup>-1</sup>	6X10 <sup>-7</sup>	3X10 <sup>-3</sup>
		S	4X10 <sup>-8</sup>	8X10 <sup>-4</sup>	1X10 <sup>-9</sup>	3X10 <sup>-5</sup>
	Y 92	I	3X10 <sup>-7</sup>	8X10 <sup>-4</sup>	1X10 <sup>-9</sup>	3X10 <sup>-5</sup>
		S	4X10 <sup>-7</sup>	2X10 <sup>-3</sup>	1X10 <sup>-8</sup>	6X10 <sup>-5</sup>
	Y 93	I	3X10 <sup>-7</sup>	2X10 <sup>-3</sup>	1X10 <sup>-8</sup>	6X10 <sup>-5</sup>
		S	2X10 <sup>-7</sup>	8X10 <sup>-4</sup>	6X10 <sup>-9</sup>	3X10 <sup>-5</sup>
Zinc (30)	Zn 65	I	1X10 <sup>-7</sup>	8X10 <sup>-4</sup>	5X10 <sup>-9</sup>	3X10 <sup>-5</sup>
		S	1X10 <sup>-7</sup>	3X10 <sup>-3</sup>	4X10 <sup>-9</sup>	1X10 <sup>-4</sup>
	Zn 69 m	I	6X10 <sup>-8</sup>	5X10 <sup>-3</sup>	2X10 <sup>-9</sup>	2X10 <sup>-4</sup>
		S	4X10 <sup>-7</sup>	2X10 <sup>-3</sup>	1X10 <sup>-8</sup>	7X10 <sup>-5</sup>
	Zn 69	I	3X10 <sup>-7</sup>	2X10 <sup>-3</sup>	1X10 <sup>-8</sup>	6X10 <sup>-5</sup>
		S	7X10 <sup>-6</sup>	5X10 <sup>-2</sup>	2X10 <sup>-7</sup>	2X10 <sup>-3</sup>
Zirconium (40)	Zr 93	I	9X10 <sup>-6</sup>	5X10 <sup>-2</sup>	3X10 <sup>-7</sup>	2X10 <sup>-3</sup>
		S	1X10 <sup>-7</sup>	2X10 <sup>-2</sup>	4X10 <sup>-9</sup>	8X10 <sup>-4</sup>
	Zr 95	I	3X10 <sup>-7</sup>	2X10 <sup>-2</sup>	1X10 <sup>-8</sup>	8X10 <sup>-4</sup>
		S	1X10 <sup>-7</sup>	2X10 <sup>-3</sup>	4X10 <sup>-9</sup>	6X10 <sup>-5</sup>
	Zr 97	I	3X10 <sup>-8</sup>	2X10 <sup>-3</sup>	1X10 <sup>-9</sup>	6X10 <sup>-5</sup>
		S	1X10 <sup>-7</sup>	5X10 <sup>-4</sup>	4X10 <sup>-9</sup>	2X10 <sup>-5</sup>
	I	9X10 <sup>-8</sup>	5X10 <sup>-4</sup>	3X10 <sup>-9</sup>	2X10 <sup>-5</sup>	

APPENDIX A

CONCENTRATIONS IN AIR AND WATER ABOVE NATURAL BACKGROUND

See notes at end of appendix

Element (atomic number)	Isotope <sup>1</sup>	Table I		Table II	
		Column 1 Air (uc/ml)	Column 2 Water (uc/ml)	Column 1 Air (uc/ml)	Column 2 Water (uc/ml)
Any single radionuclide not listed above with decay mode other than alpha emission or spontaneous fission and with radioactive half-life less than 2 hours.	Sub	1X10 <sup>-6</sup>	-----	3X10 <sup>-8</sup>	-----
Any single radionuclide not listed above with decay mode other than alpha emission or spontaneous fission and with radioactive half-life greater than 2 hours.		3X10 <sup>-9</sup>	9X10 <sup>-5</sup>	1X10 <sup>-10</sup>	3X10 <sup>-6</sup>
Any single radionuclide not listed above, which decays by alpha emission or spontaneous fission.		6X10 <sup>-13</sup>	4X10 <sup>-7</sup>	2X10 <sup>-14</sup>	3X10 <sup>-8</sup>

APPENDIX A

NOTE: In any case where there is a mixture in air or water of more than one radionuclide, the limiting values for purposes of this Appendix should be determined as follows:

1. If the identity and concentration of each radionuclide in the mixture are known, the limiting values should be derived as follows: Determine, for each radionuclide in the mixture, the ratio between the quantity present in the mixture and the limit otherwise established in Appendix A for the specific radionuclide when not in a mixture. The sum of such ratios for all the radionuclides in the mixture may not exceed 1 (i.e., unity).



APPENDIX A

EXAMPLE: If radionuclides a, b, and c are present in concentrations  $C_a$ ,  $C_b$ , and  $C_c$ , and if the applicable MPC's are  $MPC_a$ , and  $MPC_b$ , and  $MPC_c$ , respectively, then the concentrations shall be limited so that the following relationship exists:

$$\frac{C_a}{MPC_a} + \frac{C_b}{MPC_b} + \frac{C_c}{MPC_c} \leq 1$$

2. If either the identity or the concentration of any radionuclide in the mixture is not known, the limiting values for purposes of Appendix A shall be:

- a. For purposes of Table I, Col. 1 ---  $6 \times 10^{-13}$
- b. For purposes of Table I, Col. 2 ---  $4 \times 10^{-7}$
- c. For purposes of Table II, Col. 1 ---  $2 \times 10^{-14}$
- d. For purposes of Table II, Col. 2 ---  $3 \times 10^{-8}$

3. If any of the conditions specified below are met, the corresponding values specified below may be used in lieu of those specified in paragraph 2 above.

a. If the identity of each radionuclide in the mixture is known but the concentration of one or more of the radionuclides in the mixture is not known, the concentration limit for the mixture is the limit specified in Appendix A for the radionuclide in the mixture having the lowest concentration limit; or,

b. If the identity of each radionuclide in the mixture is not known, but it is known that certain radionuclides specified in Appendix A are not present in the mixture, the concentration limit for the mixture is the lowest concentration limit specified in Appendix A for any radionuclide which is not known to be absent from the mixture; or,

c. Element (atomic number) and isotope	Table I		Table II	
	Column 1 Air (uc/ml)	Column 2 Water (uc/ml)	Column 1 Air (uc/ml)	Column 2 Water (uc/ml)

If it is known that Sr  
90, I 125, I 126, I 129,  
I 131, (I 133, Table II  
only), Pb 210, Po 210,  
At 211, Ra 223, Ra 224,  
Ra 226, Ac 227, Ra 228,  
Th 230, Pa 231, Th 232,  
Th-nat, Cm 248, Cf 254,  
and Fm 256 are not  
present

-----	$9 \times 10^{-5}$	-----	$3 \times 10^{-9}$
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APPENDIX A

c. Element (atomic number) and isotope	Table I		Table II	
	Column 1 Air (uc/ml)	Column 2 Water (uc/ml)	Column 1 Air (uc/ml)	Column 2 Water (uc/ml)
If it is known that Sr 90, I 125, I 126, I 129, (I 131, I 133, Table II only), Pb 210, Po 210, Ra 223, Ra 226, Ra 228, Pa 231, Th-nat, Cm 248, Cf 254, and Fm 256 are not present	-----	6X10 <sup>-5</sup>	-----	2X10 <sup>-6</sup>
If it is known that Sr 90, I 129, (I 125, I 126, I 131, Table II only), Pb 210, Ra 226, Ra 228, Cm 248, and Cf 254 are not present	-----	2X10 <sup>-10</sup>	-----	6X10 <sup>-7</sup>
If it is known that (I 129, Table II only), Ra 226, and Ra 228 are not present	-----	3X10 <sup>-6</sup>	-----	1X10 <sup>-7</sup>
If it is known that alpha-emitters and Sr 90, I 129, Pb 210, Ac 227, Ra 228, Pa 230, Pu 241, and Bk 249 are not present	3X10 <sup>-9</sup>	-----	1X10 <sup>-10</sup>	-----
If it is known that alpha-emitters and Pb 210, Ac 227, Ra 228, and Pu 241 are not present	3X10 <sup>-10</sup>	-----	1X10 <sup>-11</sup>	-----
If it is known that alpha-emitters and Ac 227 are not present	3X10 <sup>-11</sup>	-----	1X10 <sup>-12</sup>	-----
If it is known that Ac 227, Th 230, Pa 231, Pu 238, Pu 239, Pu 240, Pu 242, Pu 244, Cm 248, Cf 249 and Cf 251 are not present	3X10 <sup>-12</sup>	-----	1X10 <sup>-13</sup>	-----

4. If a mixture of radionuclides consists of uranium and its daughters in ore dust prior to chemical separation of the uranium from the ore, the values specified below may be used for uranium and its daughters through radium-226, instead of those from paragraphs 1, 2, or 3 above.

APPENDIX A

a. For purposes of Table I, Column 1,  $1 \times 10^{-10}$  uc/ml gross alpha activity; or  $5 \times 10^{-11}$  uc/ml natural uranium; or 75 micrograms per cubic meter of air natural uranium.

b. For purposes of Table II, Column 1,  $3 \times 10^{-12}$  uc/ml gross alpha activity; or  $2 \times 10^{-12}$  uc/ml natural uranium; or 3 micrograms per cubic meter of air natural uranium.

5. For purposes of this note, a radionuclide may be considered as not present in a mixture if (a) the ratio of the concentration of that radionuclide in the mixture ( $C_a$ ) to the concentration limit for that radionuclide specified in Table II of Appendix A ( $MPC_a$ ) does not exceed 1/10, (i.e.,  $\frac{C_a}{MPC_a} \leq \frac{1}{10}$  and (b) the sum of such ratios for all nuclides considered as not present in the mixture does not exceed 1/4, (i.e.,

$$\frac{C_a}{MPC_a} + \frac{C_b}{MPC_b} + \dots \leq \frac{1}{4}$$

<sup>1</sup>Soluble (S); Insoluble (I).

<sup>2</sup>"Sub" means that values given are for submersion in a semi-spherical infinite cloud of airborne material.

<sup>3</sup>These radon concentrations are appropriate for protection from radon-222 combined with its short-lived daughters. Alternatively, the value in Table I may be replaced by one-third (1/3) "working level." (A "working level" is defined as any combination of short-lived radon-222 daughters, polonium-218, lead-214, bismuth-214 and polonium-214, in one liter of air, without regard to the degree of equilibrium, that will result in the ultimate emission of  $1.3 \times 10^5$  MeV of alpha particle energy.) The Table II value may be replaced by one-thirtieth (1/30) of a "working level." The limit on radon-222 concentrations in restricted areas may be based on an annual average.

<sup>4</sup>For soluble mixtures of U-238, U-234 and U-235 in air chemical toxicity may be the limiting factor. If the percent by weight (enrichment) of U-235 is less than 5, the concentration value for a 40-hour workweek, Table I, is 0.2 milligrams uranium per cubic meter of air average. For any enrichment, the product of the average concentration and time of exposure during a 40-hour workweek shall not exceed  $8 \times 10^{-3}$  SA uCi-hr/ml, where SA is the specific activity of the uranium inhaled. The concentration value for Table II is 0.007 milligrams uranium per cubic meter of air. The specific activity for natural uranium is  $6.77 \times 10^{-7}$  curies per gram U. The specific activity for other mixtures of U-238, U-235 and U-234, if not known, shall be:

$$SA = 3.6 \times 10^{-7} \text{ curies/gram U} \quad \text{U-depleted}$$

$$SA = (0.4 + 0.38 E + 0.0034 E^2) 10^{-6} \quad E \geq 0.72$$

where E is the percentage by weight of U-235, expressed as percent.

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS  
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
DIVISION OF AIR AND HAZARDOUS MATERIALS

Amendments To Rules And Regulations For Hazardous Waste Generation,  
Transportation, Treatment, Storage And Disposal, Effective 18 July 1984  
Effective 20 September 1984

3.38 "Manifest" shall mean the Rhode Island Uniform Hazardous Waste Manifest provided by the Department or any other manifest approved by the United States Environmental Protection Agency for identifying, but not limited to, quantity, composition, type and the origin, routing and destination of hazardous waste from the point of generation, including designated storage the point of disposal or treatment. The Rhode Island Uniform Hazardous Waste Manifest, along with instructions for completing it, are in Appendix 11 of these rules and regulations.

5.02 Storage: Any material designated as a hazardous waste stored at the site of generation for a period not to exceed 90 days shall be termed temporary storage and excluded from storage permit requirements provided that such waste is shipped off site within 90 days and is managed in accordance with the provisions of 40 CFR §262.34, and, where applicable, 40 CFR 264.175, as are or as shall be amended. Generators storing hazardous waste for a period exceeding 90 days shall obtain a storage permit unless the amount accumulated is less than 55 gallons.

5.03 C. The generator must complete the generator section of a Rhode Island Uniform Hazardous Waste Manifest or another manifest prior to the shipment of the waste. If the generator uses other than a Rhode Island Uniform Hazardous Waste Manifest, he must include all of the information required on the Rhode Island Manifest. The generator may use the destination state's manifest if that state supplies a manifest and requires its use. If not, the generator must use the Rhode Island Manifest.

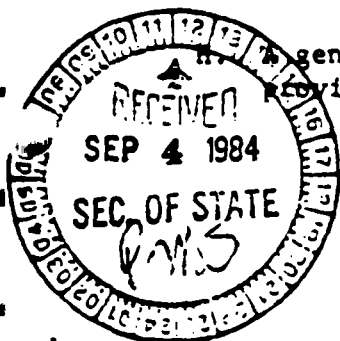
D. After the transporter has signed the manifest, the generator shall remove Copy 7 and return it to the Department. He shall also remove Copy 6 and mail it to the state where the facility is located.

E. Copy 8 of the form shall be retained with the generator's records. The remaining copies of the form shall be turned over to the transporter and shall accompany the waste through the routing indicated by the generator.

F. A generator must instruct the transporter to return the waste if he is unable to deliver it to the designated facility.

G. A generator sending or receiving waste to or from a foreign country shall comply with 40 CFR §262.50, as is or as shall be amended.

A generator shipping wastes via rail or water must comply with the provisions of 40 CFR 262.23(c) or (d), as are or as amended.



- 6.01 D. The permit will be granted or renewed only for those hazardous waste vehicles which are listed on the permit application and which pass inspection by Department personnel.
- 6.04 C. The transporter shall complete the transporter's section of the manifest, sign the manifest, and leave Copies 6, 7 and 8 with the generator.
- D. The transporter shall keep the completed manifest, minus Copies 6, 7 and 8, with the hazardous waste until received by the consignee,
- E. The transporter will upon receipt of the hazardous waste by the consignee, remove Copy 5 for his records and turn over the rest of the manifest to the consignee.
- 7.01 A. Permits And Approvals - All persons who shall construct, substantially alter or operate a hazardous waste treatment, storage or disposal facility or who shall treat, store or dispose of hazardous waste must obtain an operating permit or approval from the Director for such activity, except that the following shall not require a permit or approval. All the following be required to be in compliance with Rule 9 of these rules and regulations:
- 9.10 Manifests: The facility owner or operator must not accept any waste without a completed Rhode Island Uniform Hazardous Waste Manifest and must process the manifest according to standards equivalent to 40 CFR 264.71, as is or as amended. The facility owner or operator must report the attempted delivery of all unmanifested waste. After signing the manifest, the owner or operator must mail Copy 1 to the Department, Copy 2 to the state where the waste was generated and Copy 3 to the generator. Copy 4 is retained for his records.

These amendments replace those of like designation filed on 28 June 1984 and effective on 18 July 1984.

Department of Environmental Management  
Division of Air and Hazardous Materials

Amendments To The Rules And Regulations For Hazardous Waste  
Generation, Transportation, Treatment, Storage And Disposal, Effective 18 July 1984  
Effective 29 January 1986

- 2.02 Permit Conditions: All permits, except transporter permits and infectious incinerator permits, must incorporate restrictions which are equivalent to 264, 270.30, 270.31, 270.32 and 270.33, as are or as amended.
- 3.01 "Active portion" shall mean any portion of a hazardous waste management facility which is being used or has been used in the past to unload, treat, store or dispose of hazardous waste, but does not include the closed portion.
- 3.01-1 "Acutely hazardous waste" shall mean the following materials or items identified in 40 CFR 261.33, paragraphs e and f, as are or as amended.
- 3.10-1 "Critical habitat" shall mean that area for an endangered species as defined in the Endangered Species Act, 16 U.S.C. 1532, as is or as amended.
- 3.16 "Facility" shall mean all contiguous land, structures and other appurtenances and improvements on the land used for treating, storing or disposing of hazardous waste.
- 3.17-1 "Fault" shall mean a fracture along which rocks on one side have been displaced with respect to those on the other side.
- 3.17-2 "Flood plain" shall mean that area covered by a flood that has a one percent or greater chance of occurring in any year or of a magnitude equalled or exceeded once in 100 years on the average.
- 3.18-1 "On site" shall mean the same or geographically contiguous property which may be divided by public or private right-of-way, provided the entrance and exit between the properties is at a cross-roads intersection and access is by crossing as opposed to going along the right-of-way. Non-contiguous properties owned by the same person connected by a right-of-way which he controls and to which the public does not have access is also considered on site property.
- 3.18-2 "Manufacturing and mining by-products" shall mean secondary or incidental materials created in manufacturing or mining operations.

- 3.41 "Person" shall mean an individual, trust, firm, joint stock company, corporation (including a government corporation), partnership, association, the Federal Government or any agency or subdivision thereof, a state, municipality, commission, political subdivision of a state, or any interstate body.
- 3.42 "Precious metal bearing wastes" shall mean all materials destined for reclamation containing a concentration of gold, silver, rhodium, palladium and/or platinum which makes the waste economically recoverable including, but not limited to, plating baths and stripping solutions but shall not include any waste which is listed in Subpart B of 40 CFR 261 or is a sludge.
- 3.47-1 "Storage facility" means any facility that stores hazardous wastes and that has a closure plan that provides for the complete removal of all wastes.
- 3.57 "Type 2A - Highly Reactive Waste" shall mean a waste which in itself is readily capable of initiating a detonation, or of explosive decomposition, or of a reaction at normal temperature and pressures, or which reacts explosively with water, or which is a forbidden explosive as defined in 49 CFR 173.51 or a Class A or Class B explosive as defined in 49 CFR 173.53 or 49 CFR 173.88 respectively, as are or as amended.
- 3.74 "Waste" shall include but not be limited to materials that are discarded or sometimes discarded or are handled prior to being discarded or have served their original intent including manufacturing and mining by-products that are being discarded.
- 3.78-1 "Wetlands" shall mean marshes, swamps, bogs, ponds, rivers, river and stream flood plains and banks; areas subject to flooding or storm flowage, emergent and submergent plant communities in any body of fresh water including rivers and streams and that area of land within fifty (50') of the edge of any bog, marsh, swamp or pond.



- 4.02G Will not be more stringent than 40 CFR 262.34(b), as is or as amended.
- 5.02 Storage: Any material designated as a hazardous waste stored on site by a generator for a period not to exceed 90 days shall be termed temporary storage and excluded from storage permit requirements provided that such waste is shipped off site within 90 days and is managed in accordance with the provisions of 40 CFR §262.34, as is or as shall be amended. The Director may also require compliance with 40 CFR 264.175, as is or as amended. Generators storing hazardous waste for a period exceeding 90 days shall obtain a storage permit unless the amount accumulated is less than 55 gallons. (See Rule 7.01A.1)
- 5.03 Waste Shipment: The generator shall send hazardous waste only to a facility which is authorized to operate under either a State hazardous waste program approved under Section 3006 of the Resource Conservation and Recovery Act as amended (RCRA) or the Federal Hazardous Waste Program under Subtitle C of RCRA. The generator must not send hazardous waste from the property on which it is generated, on site, without preparing a manifest to accompany the waste nor shall he offer hazardous waste to a facility which does not have an EPA I.D. number or to a transporter that does not have an EPA I.D. number.
- 5.03D After the transporter has signed the manifest, the generator shall remove the appropriate copy and return it to the Department. He shall also remove the destination state's copy and mail it to the state in which the facility is located.
- 5.03E The generator shall also maintain a copy of the manifest for his records. All remaining copies shall be turned over to the transporter and shall accompany the waste through the routing indicated by the generator.
- 5.03F A generator must instruct the transporter to return the waste or deliver it to an alternate facility if he is unable to deliver it to the designated facility(s).
- 5.03I A generator who does not receive a copy of a manifest from the facility to which that waste was sent within 15 days of the date that waste was accepted by the initial transporter must comply with the provisions of 40 CFR 262.42, as is or as amended, and file an exception report with the Department.

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5.03J A generator must designate on the manifest one facility which is permitted to handle the waste described on the manifest.

5.03K A generator may also designate on the manifest one alternate facility which is permitted to handle his waste in the event an emergency prevents delivery of the waste to the primary designated facility.

#### 5.04 Labelling

A. The generator shall label the side of all hazardous waste containers in accordance with the provisions of 49 CFR 172 and include the following:

1. Generator's name and address of generating facility
2. The generic names of the principal hazardous waste components
3. The waste type(s), name(s) and number(s)
4. Date of containerization
5. The Hazardous Waste Manifest Number

B. The generator must label and mark every container in accordance with the provisions of 40 CFR 262.32, as is or as amended, and must comply, with respect to the initial transporter, with the requirements of 40 CFR 262.33, as is or as amended.

5.05 Biennial Reports: The generator must prepare and submit a biennial report in accordance with the provisions of 40 CFR 262.41, as is or as amended. The generator may also be required to submit additional reports at the request of the Director.

5.06 Record Keeping: The generator shall keep all pertinent records relating to the generation of hazardous waste for a period of three years after the waste has been delivered to an authorized facility or for such longer periods as is required in an unresolved enforcement action. These records shall include but not be limited to Copies 3 and 5 of each manifest, a copy of each biennial report, a copy of each waste analysis and a copy of any tests and other determinations made regarding the content of the waste.

5.08 **Typing Of Hazardous Waste:** The generator shall ensure that all waste generated be investigated for potential hazard. If the waste contains substances fitting the definitions of hazardous, appropriate indications must be made on labels and the manifest to accompany the waste. If the Director challenges the typing or designation of the waste by the generator, the generator shall change the typing and designation or demonstrate, to the satisfaction of the Director, that the waste has been appropriately typed and designated. After the receipt of an adequate demonstration by the generator, the Director shall inform the generator of his determination within 30 days. Until the determination is made by the Director, the waste in question shall be disposed of only at a facility approved to accept wastes of the higher risk designation. Testing employed by the generator to determine if a material is a hazardous waste must be an approved method set forth in 40 CFR 261, Subpart C. Equivalent testing methods are not allowed.

6.03K **Transporters of wastes to foreign countries must comply with 40 CFR 263.20(g), as is or as amended.**

6.03L **These rules and regulations as applied to transporters of waste by water (bulk shipment) are modified by 40 CFR 263.20(e) and 40 CFR 263.22(b), as are or as amended.**

6.03M **These rules and regulations as applied to transporters of wastes by rail are modified by 40 CFR 263.20(f), as is or as amended, and 40 CFR 263.22(c), as is or as amended.**

6.04C **The transporter shall complete the transporter's section of the manifest, sign the manifest, and leave the manifest copies referenced in Rules 5.03D and 5.03E with the generator.**

6.04D **The transporter shall keep the completed manifest, minus the copies referred to in Rules 5.03D and 5.03E, with the hazardous waste until received by the consignee.**

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6.04E The transporter will, upon receipt of the hazardous waste by the consignee, remove the transporter copy for his records and turn over the remaining copies to the consignee.

6.04E The transporter must deliver the hazardous waste only to the facility designated on the manifest. If this is not possible, he must contact the generator for further instructions and revise the manifest in accordance with the generator's instructions.

7.01A Permits And Approvals - All persons who shall construct, substantially alter or operate a hazardous waste treatment, storage or disposal facility or who shall treat, store or dispose of hazardous waste must first obtain an operating permit or approval from the Director for such activities and must have such permits during the active life of the facility, and for any unit which closes after 26 January 1983, for any post-closure care period required under these rules, except that the following shall not require a permit or approval nor shall the following be required to be in compliance with Rule 9 of these rules and regulations:

7.01A.1 The storage of hazardous waste on site by a generator for a period of time less than 90 days. (See Rule 5.02)

7.01A.3 The treatment of waste at facilities which neutralize and/or treat aqueous waste at the site of generation where such treatment is subject to regulation under Section 402 or 307(b) of the Federal Clean Water Act, as amended, and Section 46-12-5 of the General Laws of Rhode Island, as amended, unless otherwise required by the Director except for those operations at the facility which are not covered by either of the aforementioned laws.

7.01A.4 The storage of hazardous wastes for greater than 90 days if the generator accumulates less than 55 gallons of waste during that time as long as the generator complies with the standards of 40 CFR 261.5(f), (g), and (h), as are or as amended. In the event that any of that waste is acutely hazardous waste, the amount of that waste that may be accumulated is one kilogram.

- 7.01C Trial Burn Permits - The operator of an incinerator facility, prior to the receipt of an operating permit for the incineration of hazardous waste, must obtain from the Director a trial burn permit in accordance with the requirements of 40 CFR 270.62, as is or as amended. Trial burn plans, required by 40 CFR 270.62, as is or as amended, must include a waste analysis in accordance with 40 CFR 264.341, as is or as amended, and with the standards of 264.344, as is or as amended.
- 7.01E Existing Facilities - Existing facilities, those in operation on or before 19 November 1980, may continue to operate with the approval of the Director, until the Department renders a decision on their permit application. These facilities must be in compliance with standards of 40 CFR 265, as is or as amended.
- 7.01F Land and Underground Injection Control - Disposal of hazardous wastes by ocean disposal and underground injection control (UIC) is prohibited.
- 7.01G The owner or operator of a publicly owned treatment works which accepts hazardous waste for treatment is not required to apply for a permit and is deemed to have a permit under this section provided that such owner or operator complies with the requirements of 40 CFR 270.60(c), as is or as amended.
- 7.07A.1 The Director, after public notice and public hearing, as required by Sections 23-19.1-10(b) and 23-19.1-10(c) of the R.I.G.L., is authorized to issue, revoke, amend or suspend a permit or the Director may deny a permit. In doing so, the Director shall follow procedures established by these rules and regulations and by the applicable portions of 40 CFR 124.3 and 124.5, as are or as amended.

- 7.07A.2. A decision by the Director to deny a permit shall be issued after notice and an opportunity to be heard as required for permits under Section 7.07A., except that public hearings shall be held only as required by 40 CFR 124.12, as is or as amended.
- 7.07G. Permits may not be issued nor shall public notice be issued under Rule 7.07A. for any facility for which the application does not meet the substantive requirements of Rules 8.01 - 8.04, inclusive.
- 7.08B The permitting agency or other designated authorized personnel shall conduct inspections and shall have the right to enter without prior notice to inspect any hazardous waste management facility for which an application has been received or for which a permit has been issued. Any application shall constitute permission for or willingness to comply with inspections, tests and investigations by the Director or his agents.
- 8.01B All applications must be signed by the operator in accordance with the provisions of 40 CFR 270.11, as is or as amended. In instances where the applicant is not the owner of the facility, the application must be co-signed by the owner.
- 8.01H All applications for new facilities must be submitted to the Director at least 180 days prior to the expected commencement date of physical construction.
- 8.01G Information must be submitted regarding protection of groundwater equivalent to that required by 40 CFR 270.14(c), as is or as amended, for the appropriate type facility.
- 8.04U For facilities that store containers of hazardous waste:
1. The information required by 40 CFR 264.175, as is or as amended, including a description of the containment system showing that the design and construction is in conformance with 40 CFR 264.175(a), as is or as amended, and including:

- a. Bas.: design parameters, dimensions and materials of construction.
- b. How the design promotes drainage or how containers are kept from contact with standing liquids.
- c. Capacity of containment system.
- d. Provisions for run-off control/prevention.
- e. How accumulated liquids can be analyzed and removed to prevent overflow.

2. Sketches, drawings or data demonstrating compliance with 1.
3. Where incompatible wastes are stored or otherwise managed in containers, a description of the procedures used to ensure compliance with 40 CFR 264.177, as is or as amended.
4. Where flammable or reactive wastes are stored, a description of procedures used to ensure compliance with 40 CFR 264.176, as is or as amended.

9.03 Groundwater Monitoring: The owner or operator of the facility must maintain and comply with the groundwater monitoring plan required by Rule 8.04G. of these rules and regulations and 40 CFR 264.90 - 100, as is or as amended, unless this requirement has been waived by the Director on the basis of the criteria in 40 CFR 264.90(b)(3) and (4), as is or as amended.

9.10 Manifests: The facility owner or operator must not accept any waste without a completed Rhode Island Uniform Hazardous Waste Manifest, or other New England State manifest, and must process the manifest according to standards equivalent to 40 CFR 264.71, as is or as amended. The facility owner or operator must report to the Director the attempted delivery of all unmanifested waste using EPA Form 8700-11B or by providing all the information required by 40 CFR 264.76, as is or as amended. After signing the manifest, the owner or operator must mail a copy to the Department, a copy to the state

where the waste was generated and a copy to the generator. A copy is retained for his records.

**9.13 Record Availability:** The facility owner or operator must make available to the Director, upon request, all records including those required by 40 CFR 270.10(1), as is or as amended, which the Director feels pertinent to the enforcement of these rules and regulations and the facility operator must maintain these records on file for a minimum of three (3) years. In the event of unresolved enforcement actions, the records must be maintained until released by the Director. Upon closure, these records, including those showing waste disposal locations must be submitted to the local land authority and to the Director.

**9.20 Flood Plain Location:** Owners and operators of all treatment and storage facilities located in the 100 year flood plain must, if applicable, comply with the procedures identified in Rule 8.05 of these rules and regulations.

**9.21 Initiator:** Owners and operators of facilities that initiate a hazardous waste shipment must comply with Rules 5.00 - 5.11 of these rules and regulations.

**3.37-1 "Local land authority"** shall mean a city or town council.

**8.01F** The applicable requirements for the particular type facility equivalent to those found in 40 CFR 270.17-21, as are or as amended.

Table 1  
Acceptable Ambient Levels

Proposed Substances for Air Toxics Regulation

Draft - ~~October 1985~~ February 1987

( $\mu\text{g}/\text{m}^3$ )

	1 hr	24 hours	1 year		1 hr	24 hours	1 year
Acrylonitrile			0.07	Formaldehyde			
Aniline		3	.	Hydrazine			0.0003
<i>o</i> -Anisidine		1	0.02	Hydrochloric acid	2000	600	
Antimony dust + fumes		200		Manganese dust + fumes		0.2	
Arsenic			0.0002	Methyl cellosolve		100	
Benzene			0.1	MDI		1	
Benzidine			0.00002	MOCA			1
Benzotrichloride			0.0007	Nickel dust + fumes			0.002
Benzyl chloride	10		0.01	5-Nitro <i>o</i> -anisidine			0.08
Biphenyl		0.4		2-Nitropropane			0.1
Cadmium dust + fumes			0.0006	Perchloroethylene			0.05
Carbon tetrachloride			0.03	Toluene		2000	400
Chloroform			0.04	TDI		1	0.02
Chromium dust + fumes			0.00009	<i>o</i> -Toluidine			0.04
3,3' Dichlorobenzidine			0.002	1,1,2 Trichloroethane			7
1,2 Dichloroethane			0.04	Trichloroethylene			0.4
Dichloromethane			0.2	Triethylamine		200	20
Diethyl sulfate			0.2	Styrene			20
Diethyl phthalate	200	0.5		Xylenes		700	
Diphenylamine		200		Hydrogen fluoride	60		
Epichlorohydrin	200	0.8					
Ethylene oxide			0.01				



Table 2

## Acceptable Ambient Levels with LAER

Proposed Substances for Air Toxics RegulationFebruary 1987  
Draft - October 1985

	(mg/m <sup>3</sup> )					
	1hr	24 hours	1 year	1hr	24 hours	1 year
Acrylonitrile			0.7	Formaldehyde		
Aniline		3	.	Hydrazine		0.003
o-Anisidine		1	0.2	Hydrochloric acid	2000	600
Antimony dust + fumes		200		Manganese dust + fumes		0.2
Arsenic			0.002	Methyl cellosolve		100
Benzene			1	MDI		1
Benzidine			0.0002	MOCA		1
Benzotrichloride			0.007	Nickel dust + fumes		0.02
Benzyl chloride	10		0.1	5-Nitro o-anisidine		0.8
Biphenyl		0.4		2-Nitropropane		0.1
Cadmium dust + fumes			0.006	Perchloroethylene		0.5
Carbon tetrachloride			0.3	Toluene	2000	400
Chloroform			0.4	TDI	1	0.2
Chromium dust + fumes			0.0009	o-Toluidine		0.4
3,3' Dichlorobenzidine			0.02	1,1,2 Trichloroethane		7
1,2 Dichloroethane			0.4	Trichloroethylene		4
Dichloromethane			2	Triethylamine	200	20
Diethyl sulfate			0.2	Styrene		20
Dioctyl phthalate	200	5		Xylenes	700	
Diphenylamine		200		Hydrogen fluoride	60	
Epichlorohydrin	200	5				
Ethylene oxide			0.1			

AIR POLLUTION CONTROL REGULATION NO. 17

ODORS

Effective 22 February 1977

RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

DIVISION OF AIR AND HAZARDOUS MATERIALS

AIR POLLUTION CONTROL REGULATION NO. 17

ODORS

17. Odors

17.1 Prohibitions

No person shall emit or cause to be emitted into the atmosphere any air contaminant or combination of air contaminants which creates an objectionable odor beyond the property line of said person.

17.2 Odor Evaluations

A staff member of the Division of Air Resources shall determine by personal observation if an odor is objectionable, taking into account its nature, concentration, location, duration and source.

AIR POLLUTION CONTROL REGULATION NO. 9  
APPROVAL TO CONSTRUCT, INSTALL, MODIFY OR OPERATE

Effective 3 October 1971

Amended 2 May 1985

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RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
DIVISION OF AIR AND HAZARDOUS MATERIALS  
AIR POLLUTION CONTROL REGULATION NO. 9

APPROVAL TO CONSTRUCT, INSTALL, MODIFY OR OPERATE

9. Approval to Construct, Install, Modify or Operate

9.1 Definitions

As used in these regulations, the following terms shall, where the context permits, be construed as follows:

9.1.1 "Actual emissions" means the actual rate of emissions of a pollutant from an emissions unit, as determined in accordance with Subsections (a) through (c) below:

- (a) In general, actual emissions as of a particular date shall equal the average rate, in tons per year, at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. The Director shall allow the use of a different time period upon a determination that it is more representative of normal source operation. Actual emissions shall be calculated using the unit's actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.
- (b) The Director may presume that source specific allowable emissions for the unit are equivalent to the actual emissions of the unit.

(c) For any emissions unit which has not begun normal operations on the particular date, actual emissions shall equal the potential to emit of the unit on that date.

9.1.2 "Air pollution control system" means a system, device or equipment designed and installed primarily for the purpose of reducing or eliminating the emission of air contaminants to the atmosphere.

9.1.3 "Allowable emissions" means the emission rate of a stationary source calculated using the maximum rated capacity of the source unless limited by conditions of an operating and a construction permit and the most stringent of the following:

(a) Applicable standards as set forth in 40 CFR Parts 60 and 61 (New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants); or

(b) Any applicable State Implementation Plan emission limitations, including those with a future compliance date; or

(c) The emissions rate specified in a federally enforceable permit.

9.1.4 "Attainment or unclassifiable area" means for any air pollutant, an area which is not designated as a nonattainment area.

9.1.5 "Begin actual construction" means, in general, initiation of physical onsite construction activities on an emissions unit which are of a permanent nature. Such activities

include, but are not limited to, installing building supports and foundations, laying underground pipework, and constructing permanent storage structures. With respect to a change in the method of operation, this term refers to those on-site activities, other than preparatory activities, which mark the initiation of the change.

- 9.1.6 "Commence" as applied to construction of a major stationary source or major modification means that the owner or operator has all the necessary preconstruction approvals or permits and either has:
- (a) begun or caused to begin, a continuous program of actual on-site construction of the source, to be completed within a reasonable time; or
  - (b) entered into binding agreements or contractual obligations, which cannot be cancelled or modified without substantial loss to the owner or operator, to undertake a program of actual construction of the source to be completed within a reasonable time.
- 9.1.7 "Complete" means in reference to an application for a permit, that the application contains all the information necessary for processing the application.
- 9.1.8 "Construction" means any physical change or change in the method of operation (including fabricating, erecting, locating, modification or demolition of an emissions unit) which would result in a change in actual emissions.
- 9.1.9 "Emissions unit" means any part of a stationary source which emits or would have the potential to emit any air pollutant.



- 9.1.10 "Federally enforceable" means all limitations and conditions which are enforceable by the Administrator of the U.S. Environmental Protection Agency including those requirements developed pursuant to 40 CFR Parts 60 and 61 (New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants), requirements within the State Implementation Plan and any requirements established under Air Pollution Control Regulation No. 9.
- 9.1.11 "Fixed capital cost" means the capital needed to provide all the depreciable components.
- 9.1.12 "Fugitive emissions" means those emissions which could not reasonably pass through a stack, chimney, vent or other functionally equivalent opening.
- 9.1.13 "Good engineering practice" means with respect to stack heights, the height necessary to insure that emissions from the stack do not result in excessive concentrations of any air pollutant in the immediate vicinity of the source as a result of aerodynamic downwash, eddies and wakes which may be created by the source itself, nearby structures or nearby terrain obstacles as calculated according to the Rhode Island Guideline on Air Quality Modeling.
- 9.1.14 "Major modification" means any physical change or change in the method of operation of a major stationary source that would result in a significant net emission increase

of any air pollutant. Any net emission increase that is considered significant for volatile organic compounds shall be considered significant for ozone. A physical change or change in the method of operation shall not include:

- (a) Routine maintenance, repair and replacement.
- (b) An increase in the hours of operation or in the production rate, unless such change is prohibited by conditions of any federally enforceable permit issued after 21 December 1976 pursuant to 40 CFR 52.21 (PSD) or under Air Pollution Control Regulation No. 9.
- (c) Any change in ownership at a stationary source.
- (d) Use of an alternative fuel or raw material by reason of an order under Sections 2 (a) and (b) of the Energy Supply and Environmental Coordination Act of 1974 (or any superseding legislation) or by reason of a natural gas curtailment plan pursuant to the Federal Power Act.
- (e) Use of an alternative fuel at a steam generating unit to the extent that the fuel is generated from municipal solid waste.
- (f) Use of an alternative fuel or raw material by a stationary source which:
  - (1) the source was capable of accommodating before 6 January 1975 unless such change would be prohibited under any federally enforceable

permit condition which was established after  
6 January 1975 pursuant to 40 CFR 52.21 or  
under Air Pollution Control Regulation No. 9;  
or

- (2) the source is approved to use under any permit  
issued under 40 CFR 52.21 or under Air  
Pollution Control Regulation No. 9.

9.1.15 "Modify" means any physical or operational change to any  
machine, equipment, device, article or facility which may  
result in an increased emission rate to the atmosphere of  
any air contaminant. The following shall not be  
considered a modification:

- (a) Routine maintenance, repair, and replacement of any  
machine, equipment, device, article or facility or  
parts thereof as defined in Section 9.3.
- (b) Increase in production rate of any machine,  
equipment, device, article or facility as defined in  
Section 9.3 based solely upon the capabilities of  
existing process equipment.
- (c) Increase in hours of operation up to the maximum  
hours allowed in an operating or construction  
permit.
- (d) Use of an alternative fuel or raw material if the  
machine, equipment, device, article or facility was  
designed and approved to accommodate that  
alternative use.

- 9.1.16 "Necessary preconstruction approval or permits" means those permits or approvals required under state and federal air quality control laws and regulations and those air quality control laws and regulations which are part of the applicable State Implementation Plan.
- 9.1.17 "Nonattainment area" means for any air pollutant, an area which is shown by monitored data or is calculated by air quality modeling based on monitored data, to exceed any national ambient air quality standard for such pollutant and has been designated as such in the Federal Register.
- 9.1.18 "Potential to emit" means the maximum capacity of a stationary source to emit a pollutant, excluding secondary emissions, under its physical or operational design unless limited by the conditions of an approved construction and operating permit.
- 9.1.19 "Reconstruction" will be presumed to have taken place where the fixed capital cost of the new components exceeds 50 percent of the fixed capital cost of a comparable entirely new stationary source. Any final decision as to whether reconstruction has occurred shall be made in accordance with the provisions of 40 CFR 60.15 (f) (1) - (3). A reconstructed stationary source will be treated as a new stationary source for purposes of this regulation. In determining lowest achievable emission rate for a reconstructed stationary source, the provisions of 40 CFR 60.15 (f) (4) shall be taken into

account in assessing whether a new source performance standard is applicable to such stationary source.

9.1.20 "Secondary emissions" means emissions which occur as a result of the construction or operation of a major stationary source or major modification, but do not come from the major stationary source or major modification itself. Secondary emissions must be specific, well defined, quantifiable and impact the same general areas as the stationary source or modification. Secondary emissions include emissions from any off-site support facility which would not be constructed or increase its emissions except as a result of the construction or operation of the major stationary source or major modification. Secondary emissions do not include any emissions which come directly from a mobile source, such as emissions from the tailpipe of a motor vehicle, from a train or from a vessel.

9.1.21 "Significant" means in reference to a net emissions increase or the potential of a source to emit a rate of emissions that would equal or exceed any of the following rates:

Pollutant and Emissions Rate

Carbon monoxide: 100 tons per year (tpy)  
Nitrogen oxides: 40 tpy  
Sulfur dioxide: 40 tpy  
Particulate matter: 25 tpy  
Ozone: 40 tpy of volatile organic compounds  
Lead: 0.6 tpy  
Asbestos 0.007 tpy  
Beryllium: .0004 tpy

Mercury: 0.1 tpy  
Vinyl chloride: 1 tpy  
Fluorides: 3 tpy  
Sulfuric acid mist: 7 tpy  
Hydrogen sulfide (H<sub>2</sub>S): 10 tpy  
Total reduced sulfur (including H<sub>2</sub>S): 10 tpy  
Reduced sulfur compounds (including H<sub>2</sub>S): 10 tpy  
Any other air pollutant: 25 tpy

9.1.22 "Stationary source" means any building, structure, facility or installation which emits or may emit any air pollutant.

As used in portions of these regulations pertaining to nonattainment areas, the following terms shall, where the context permits, be construed as follows:

9.1.23 "Building, structure or facility" means all of the pollutant-emitting activities which belong to the same industrial grouping are located on one or more contiguous or adjacent properties and are under control of the same person (or persons under common control).

Pollutant-emitting activities shall be considered as part of the same industrial grouping if they belong to the same "Major Group" (i.e. which have the same two-digit code) as described in the Standard Industrial Classification Manual, 1972, as amended by the 1977 Supplement (U.S. Government Printing Office Stock Numbers 4101-0066 and 003-005-00176-0, respectively).

9.1.24 "Growth Allowance" means the total amount of volatile organic compound emissions that may be emitted in a given year that are not subject to the emission offset requirements of this regulation. The Growth Allowance

(G.A.) for any particular year can be defined by the following expression:

- (a) Growth Allowance (G.A.) = Stationary Source Growth Increment (for year in question + Carryover Emissions (C.E.) (from previous year).
- (b) Stationary source growth increment is defined as those emissions that represent the allowable growth of emissions in a given year and are detailed in the Reasonable Further Progress Section of the State Implementation Plan.
- (c) Carryover Emissions (C.E.) are defined as the difference between the Projected Emissions (P.E.) and the Inventoried Emissions (I.E.) that have been determined through the Department's annual emissions inventory for a given year.
- (d) Projected Emissions (P.E.) are defined as emissions used in projecting the total hydrocarbon inventory during the nonattainment time period and represent emissions detailed in the Reasonable Further Progress Section of the State Implementation Plan.

9.1.25 "Installation" means an identifiable piece of process equipment which emits or would have the potential to emit any regulated air pollutant.

9.1.26 "Lowest achievable emission rate" means for any stationary source, the more stringent rate of emissions based on the following:

- (a) The most stringent emissions limitation which is contained in the implementation plan of any state for such class or category of stationary source, unless the owner or operator of the proposed stationary source demonstrates that such limitations are not achievable; or
- (b) The most stringent emissions limitation which is achieved in practice by such class or category of stationary source. This limitation, when applied to a modification, means the lowest achievable emissions rate for the new or modified installation within the stationary source. In no event shall the application of this term permit a proposed new or modified stationary source to emit any pollutant in excess of the amount allowable under applicable new source performance standards.

9.1.27 "Major stationary source" means:

- (a) Any stationary source of air pollutants which emits or has the potential to emit 100 tons per year or more of any regulated air pollutant; or
- (b) Any physical change that would occur at a stationary source not qualifying under Subsection 9.1.27 (a) if the change would constitute a major stationary source by itself; or
- (c) A major stationary source that is major for volatile organic compounds shall be considered major for ozone.



9.1.28 "Net emissions increase" means the amount by which the sum of the following exceeds zero:

(a) Any increase in actual emissions from a particular physical change or change in the method of operation at a stationary source; and

(b) Any other increases and decreases in actual emissions at the source that are contemporaneous with the particular change and are otherwise creditable. Creditable increases or decreases are subject to the following;

(1) An increase or decrease in actual emissions is contemporaneous with the increase from the particular change only if it occurs between:

a. the date three years before construction on the particular change commences; and

b. the date that the increase from the particular change occurs.

(2) An increase or decrease in actual emissions is creditable only if the Director has not relied on it in issuing a permit for any source under these regulations which permit is in effect when the increase in actual emissions from the particular change occurs.

(3) An increase in actual emissions is creditable only to the extent that the new level of actual emissions exceeds the old level.

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- (4) A decrease in actual emissions is creditable only to the extent that:
- a. The old level of actual emissions or the old level of allowable emissions, whichever is lower, exceeds the new level of actual emissions.
  - b. It is federally enforceable at and after the time that actual construction on the particular change begins.
  - c. It has approximately the same qualitative significance for public health and welfare as that attributed to the increase from the particular change.

(5) An increase that results from a physical change at a source occurs when the emissions unit on which construction occurred becomes operational and begins to emit a particular pollutant. Any replacement unit that requires shakedown becomes operational only after a reasonable shakedown period, not to exceed 180 days.

9.1.29 "Resource recovery facility" means any facility at which solid waste is processed for the purpose of extracting, converting to energy or otherwise separating and preparing solid waste for reuse. Energy conversion facilities must utilize solid waste to provide more than 50 percent of the heat input to be considered a resource recovery facility under these regulations.

As used in portions of these regulations pertaining to attainment or unclassifiable areas, the following terms shall, where the context permits, be construed as follows:

9.1.30 "Baseline area" means any county in which the major source or major modification establishing the baseline date would construct or would have an air quality impact equal to or greater than  $1 \text{ ug/m}^3$  (annual average) of the pollutant for which the baseline date is established.

9.1.31 "Baseline concentration" means that ambient concentration level which exists in the baseline area at the time of the applicable baseline date. A baseline concentration is determined for each pollutant for which a baseline date is established and includes the actual emissions representative of sources in existence on the applicable baseline date. Actual emissions increases and decreases at any stationary source occurring after the baseline date will not be included in the baseline concentration, but will affect increment consumption.

9.1.32 "Baseline date" means the earliest date after 7 August 1977 that the owner or operator of a major stationary source or major modification subject to 40 CFR 52.21 or Air Pollution Control Regulation No. 9 submits a complete application. The baseline date is established for each pollutant for which increments or other equivalent measures have been established if the area in which the proposed source or modification would construct is

designated as attainment or unclassifiable under Section 107 (d) (1) (D) or (E) of the Clean Air Act for the pollutant on the date of its complete application and:

- (a) For a major stationary source, the pollutant would be emitted in significant amounts; or
- (b) For a major modification, there would be a significant net emissions increase of the pollutant.

9.1.33 "Best available control technology" means an emissions limitation (including a visible emissions standard) based on the maximum degree of reduction for each air pollutant which would be emitted from any proposed stationary source or modification which the Director, on a case-by-case basis, taking into account energy, environmental and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant. In no event shall application of best available control technology result in emissions of any pollutant which would exceed the emissions allowed by an applicable standard under 40 CFR Parts 60 and 61. If the Director determines that technological or economic limitations on the application of measurement methodology to a particular emissions unit would make the imposition of air emissions standards infeasible, a design,

equipment, work practice, operational standard or combination thereof, may be prescribed instead to satisfy the requirement of best available control technology. Such standard shall to the degree possible set forth the emission reduction achievable by implementation of such design, equipment, work practice or operation and shall provide for compliance by means which achieve equivalent results.

9.1.34 "Building, structure, facility or installation" means all of the pollutant-emitting activities which belong to the same industrial grouping are located on one or more contiguous or adjacent properties and are under the control of the same person (or persons under common control) except the activities of any vessel.

Pollutant-emitting activities shall be considered as part of the same industrial grouping if they belong to the same "major group" (i.e. which have the same two-digit code) as described in the Standard Industrial Classification Manual, 1972, as amended by the 1977 Supplement (U.S. Government Printing Office Stock Nos. 4101-0066 and 003-005-00176-0, respectively).

9.1.35 "Increment" means the maximum allowable increase in pollutant concentration over the baseline concentration as set forth below:

**Particulate Matter:**

Annual geometric mean: 19 ug/m<sup>3</sup>

24-hour maximum: 37 ug/m<sup>3</sup>

**Sulfur Dioxide:**

Annual geometric mean: 20 ug/m<sup>3</sup>

24-hour maximum: 91 ug/m<sup>3</sup>

3-hour maximum: 512 ug/m<sup>3</sup>

For any period other than an annual period, the applicable maximum allowable increase may be exceeded during one such period per year at any one location.

**9.1.36 "Major stationary source" means:**

- (a) Any of the following stationary sources of air pollutants which emit, or have the potential to emit, 100 tons per year or more of any air pollutant: fossil fuel fired steam electric plants of more than 250 million Btu's (British thermal units) per hour heat input; coal cleaning plants (with thermal dryers); kraft pulp mills; portland cement plants; primary zinc smelters; iron and steel mill plants; primary aluminum ore reduction plants; primary copper smelters; municipal incinerators capable of charging more than 250 tons of refuse per day; hydrofluoric, sulfuric and nitric acid plants; petroleum refineries; lime plants; phosphate rock processing plants; coke oven batteries; sulfur recovery plants; carbon black plants (furnace

process); primary lead smelters; fuel conversion plants; sintering plants; secondary metal production plants; chemical process plants; fossil fuel boilers (or combinations thereof) totaling more than 250 million Btu's per hour heat input; petroleum storage and transfer units with the total storage capacity exceeding 300,000 barrels; taconite ore processing plants; glass fiber processing plants; and charcoal production plants; or

- (b) Notwithstanding the stationary source size specified above, any stationary source which emits or has the potential to emit 250 tons per year or more of any regulated air pollutant; or
- (c) any physical change that would occur at a stationary source not otherwise qualifying as a major stationary source if the change would constitute a major stationary source by itself.
- (d) A major stationary source that is major for volatile organic compounds shall be considered major for ozone.

9.1.37 "Net emissions increase" means the amount by which the sum of the following exceeds zero:

- (a) Any increase in actual emissions from a particular physical change or change in the method of operation at a stationary source; and

(b) Any other increases and decreases in actual emissions at the source that are contemporaneous with the particular change and are otherwise creditable. Creditable increases and decreases are subject to the following:

- (1) An increase or decrease in actual emissions is contemporaneous with the increase from the particular change only if it occurs between:
  - a. the date three years before construction on the particular change commences; and
  - b. the date that the increase from the particular change occurs.
- (2) An increase or decrease in actual emissions is creditable only if it has not been relied on in issuing a permit for the source under these regulations, which permit is in effect when the increase in actual emissions from the particular change occurs.
- (3) An increase or decrease in actual emissions of sulfur dioxide or particulate matter which occurs before the applicable baseline date is creditable only if it is required to be considered in calculating the available remaining increment.
- (4) An increase in actual emissions is creditable only to the extent that the new level of actual emissions exceeds the old level.



- (5) A decrease in actual emissions is creditable only to the extent that:
- a. the old level of actual emissions or the old level of allowable emissions, whichever is lower, exceeds the new level of actual emissions;
  - b. it is federally enforceable at and after the time that actual construction on the particular change begins; and
  - c. it has approximately the same qualitative significance for public health and welfare as that attributed to the increase from the particular change.

- (6) An increase that results from a physical change at a source occurs when the emissions unit on which construction occurred becomes operational and begins to emit a particular pollutant. Any replacement unit that requires shakedown becomes operational only after a reasonable shakedown period, not to exceed 180 days.

## 9.2 Applicability and Exemptions

9.2.1 No person shall construct, install or modify or cause the construction, installation or modification of any source described in Subsection 9.3.1 without obtaining an approved construction permit from the Director.

9.2.2 No person shall operate or cause the operation of any

major source or make any major modification to any source without an approved operating permit from the Director as of six (6) months after the effective date of this regulation.

### 9.2.3 Exemptions

(a) The provisions of this regulation shall not apply to:

(1) incinerators constructed, installed, modified or used in owner-occupied dwellings having less than three units.

(2) incinerators used to burn or incinerate hazardous or extremely hazardous wastes, but such incinerators shall comply with the regulations that are promulgated under the Rhode Island Hazardous Waste Management Act concerning the burning of these materials.

(b) The holder of an approved construction, installation or modification permit may not transfer it without prior written notification to the Director. Each new owner or operator or holder of the permit shall be responsible for complying with all applicable regulations and any permit conditions.

### 9.3 Permits: General Requirements

9.3.1 A permit to construct, install or modify is required for the following:

- (a) Fuel burning equipment designed to burn:
- (1) Residual oil or solid fossil fuels having a heat input capacity of one million Btu or more per hour;
  - (2) All other liquid fuels having a heat input capacity of five million Btu or more per hour;
  - (3) Gaseous fuel having a heat input capacity of fifteen million Btu or more per hour; or
  - (4) Alternative fuels, including but not limited to, wood chips, hazardous wastes or waste oil having a heat input capacity of one million Btu or more per hour.
- (b) Liquid petroleum storage tanks, reservoirs and containers with a capacity of forty thousand gallons or more used for the storage of petroleum liquids having a true vapor pressure greater than 1.52 psia at 69°F;
- (c) Any incinerator, except as exempted in Subsection 9.2.3 (a);
- (d) Any source or process having the potential to emit five tons per year or more of lead;
- (e) Any other source or process except for those outlined in Subsection 9.3.1 (a) having the potential to emit one hundred pounds or more per day, or ten pounds or more per hour of any air contaminant or combination of air contaminants

into the atmosphere, including but not limited to the following categories:

- (1) Surface coating, spray and dip painting, roller coating, knife coating and electrostatic depositing;
- (2) Metal cleaning or surface preparation, degreasing, bright dipping, stripping, galvanizing and chrome plating;
- (3) Textile dyeing and finishing, including tenter frames, dryers, printers and solvent dyers;
- (4) Glass or fiberglass manufacturing, including melting furnaces, forming lines, curing ovens and product cooling lines;
- (5) The production of asphalt concrete, including rotary dryers, screening and conveying systems and mixers;
- (6) The production of metal castings, including cupolas, reverberatory furnaces, electric furnaces, crucible furnaces and sand handling systems; and
- (7) The transfer of petroleum products having a true vapor pressure greater than 1.52 psia at 69°F from the storage facility to or from a mobile vessel.

(f) Any air pollution control system and appurtenances.

9.3.2 An operating permit from the Director is required as of

six (6) months after the effective date of this regulation for all major sources, all sources notified by the Director, all sources making or having made major modifications and all existing sources identified in Subsection 9.3.1 that have the potential to emit one hundred tons or more per year of any air contaminant.

9.3.3 Except as provided in Section 9.9 of this regulation, no person shall construct, install or modify or cause the construction, installation or modification of any stationary source described in Subsection 9.3.1 unless it applies the best available control technology (BACT).

(a) A stationary source shall apply BACT for each pollutant it would have the potential to emit.

(b) A modification shall apply BACT for each pollutant for which there would be a net emissions increase at the source.

In no event shall BACT be less stringent than any applicable emission rate contained in the Department's Air Pollution Control Regulations.

#### 9.4 Application for Approval of Plans to Construct, Install or Modify

9.4.1 Application for approval of plans to construct, install or modify shall be made in duplicate by the owner or operator of any source described in Subsection 9.3.1 on forms furnished by the Director and shall be signed by:

(a) an officer of the corporation if the applicant is a corporation; or

(b) one individual who is a member of the group if the applicant is a partnership or a group other than a corporation.

9.4.2 A separate application, in duplicate, is required for each source and air pollution control system described in Subsection 9.3.1.

9.4.3 Each application shall be accompanied by one set of plans, specifications and all other relative data that may be required by the Director to show:

- (a) how the source is designed and in what manner it will be operated and controlled; and
- (b) that approval of the application will not prevent the maintenance or attainment of any applicable ambient air quality standard or prevent the achievement of other air quality goals.

9.5 Administrative Action: Permits to Construct, Install or Modify

9.5.1 The Director shall act on a completed application for approval of plans to construct, install or modify within forty-five (45) days of its receipt and shall notify the applicant in writing of any action taken, including:

- (a) Approving the application and notifying the applicant on the applicable subsections of this regulation with which the applicant must comply; or
- (b) Notifying the applicant as to why the application has been denied.

9.5.2 If the application has been denied, the applicant may submit, in duplicate, answers to and comments on the Director's objections, and may request a hearing on the action. The Director shall consider the applicant's response and either affirm the prior decision or approve the application.

9.5.3 A permit to construct, install or modify shall allow the Director to:

(a) inspect the source or air pollution control system to ensure that:

(1) it is located as shown on the equipment location drawing, and

(2) it is constructed and being operated as indicated on the application;

(b) require the applicant to conduct emission tests to the specifications of the Director within sixty (60) days after the source or air pollution control system achieves its maximum or normal operating rate, but not later than one hundred eighty (180) days after initial start up;

(c) require the applicant to install sampling ports such that emission testing can be conducted in a safe manner;

(d) require the applicant to install a sampling valve for boilers burning oil to facilitate sample collection; and

(e) include the conditions outlined but not limited to those in Subsection 9.7.2.

9.5.4 An applicant may apply for an extension of the time limit by filing a written request to the Director stating the reasons for the request. Extensions may be granted for a period of not more than six (6) months.

9.5.5 The Director shall cancel or revoke a construction permit under the following conditions:

- (a) If construction, installation or modification has not commenced within one (1) year from its date of issuance;
- (b) If the work involved in the construction, installation or modification has been suspended for one (1) year or more;
- (c) If results of an emission test would indicate that emission standards cannot be achieved;
- (d) If the applicant has violated any of the conditions of the permit that would cause the source or air pollution control system to operate in such a manner that emission limitations could not be achieved; or
- (e) If the applicant has not secured the emission offsets required under Subsections 9.9.2 (b), 9.9.3 (c) and 9.9.3 (d).

9.5.6 If the construction permit has been cancelled or revoked, the applicant or holder of the permit may submit, in duplicate, a written request to the Director for the



reasons for its cancellation or revocation, and may request a hearing on the action.

**9.6 Application for Operating Permit**

9.6.1 Applications for an operating permit shall be made in duplicate by owners of all sources identified in Subsection 9.3.2 on forms furnished by the Director and shall be signed by:

- (a) An officer of the corporation if the applicant is a corporation; or
- (b) One individual who is a member of the group if the applicant is a partnership or a group other than a corporation.

9.6.2 An owner of a source may make a written request for an explanation from the Director on the methodology used in determining the source's potential to emit one hundred tons of any air contaminant per year. The Director shall respond in a timely manner to all written inquiries concerning the issue.

**9.7 Administrative Action: Operating Permits**

9.7.1 The Department shall inspect the source to determine if the conditions of the permit to construct, install or modify have been satisfied. If such an inspection determines that all the conditions have been satisfied, an operating permit shall be issued by the Director.

9.7.2 The Director may impose reasonable conditions on an operating permit, including but not limited to:

- (a) Maximum yearly hours of operation;
- (b) Maximum allowable emissions from the source;
- (c) Operation and maintenance criteria that are necessary to ensure that the maximum allowable emissions from the source are not exceeded;
- (d) Instrumentation to monitor and record emission data;
- (e) Operation of the source in a manner to ensure that attainment or maintenance of applicable state or national ambient air quality standards will not be violated; and
- (f) Operating permits shall be posted for easy access at the site of operation.

9.7.3 Operating permits initially shall be issued for a time period of between one and five years. The holder of an operating permit must make a written request for its renewal at least one hundred twenty (120) days prior to its expiration date. Thereafter, the operating permit may be re-issued for a five-year time period.

9.7.4 The Director may cancel or revoke an operating permit by notifying the holder of the permit in writing if any of the conditions of the operating permit have been violated.

9.7.5 If the operating permit has been cancelled or revoked, the holder of the permit may submit to the Director a written request for the reasons for its cancellation or revocation and may request a hearing on the action.

9.8 Transfer of an Operating Permit

9.8.1 Operating permits may not be transferred unless the holder receives written permission from the Director.

9.8.2 The new owner, operator, or person to whom the operating permit is transferred shall be responsible for complying with all applicable regulations and conditions of the permit.

9.9 Nonattainment Areas: Standards for Approving Plans to Construct, Install or Modify

9.9.1 For applications for new sources or major modifications to existing sources which have the potential to emit 100 tons or more of volatile organic compounds per year and are located in a nonattainment area with respect to the ozone standard, and for which the Director has determined that approval of the application will not cause the Growth Allowance to be exceeded, the following conditions must be met:

- (a) The major source must meet an emissions limitation that is considered the lowest achievable emission rate for this source as prescribed by the Director. This lowest achievable emission rate will be based on technological factors and can be in the form of a numerical emissions standard or a design, operational or equipment standard, and this requirement shall be a condition of the construction permit for such sources.
- (b) The applicant must certify that all existing major sources owned or operated by the applicant (or any

entity controlling, controlled by, or under common control with the applicant) located within the state are in compliance with all applicable state and federal air pollution rules and regulations and compliance schedules.

9.9.2 For applications for new sources or major modifications to existing sources which have the potential to emit 100 tons or more of volatile organic compounds per year and are located in a nonattainment area with respect to the ozone standard, and for which the Director has determined that approval of the application will cause the Growth Allowance to be exceeded, the following conditions must be met:

- (a) Subsection 9.9.1 (a) and (b) of this regulation.
- (b) The major source must provide evidence in accordance with Section 9.11 that it has reduced or has caused the reduction of emissions in sufficient quantities to offset the increase in emissions that will result from the approval of the application.
- (c) When the Director determines that the Growth Allowance has been exceeded, a finding will be made at that time concerning the emission offset ratio that will be used.
- (d) The emission offsets must:
  - (1) be approved by the Director, and be part of a construction permit, or otherwise made part of

the federally approved State Implementation Plan.

- (2) be effective prior to the issuance of the construction permit.

9.9.3 For applications from new sources or modifications to existing sources that are located in a nonattainment area with respect to the total suspended particulate (TSP), sulfur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>) and carbon monoxide (CO) standards, the applicant must:

(a) meet the conditions of Subsection 9.9.1 (a) and (b).

(b) provide data to show that the emissions from the source will not significantly increase the level of the pollutant that is responsible for the nonattainment status above the following significant levels:

<u>Pollutant</u>	<u>Averaging Time</u>				
	<u>Annual</u>	<u>24-Hr</u>	<u>8-Hr</u>	<u>3-Hr</u>	<u>1-Hr</u>
SO <sub>2</sub> (ug/m <sup>3</sup> )	1.0	5	-	25	-
TSP (ug/m <sup>3</sup> )	1.0	5	-	-	-
NO <sub>2</sub> (ug/m <sup>3</sup> )	1.0	-	-	-	-
CO (mg/m <sup>3</sup> )	-	-	0.5	-	2

- (c) Modifications to existing sources, and new sources which are not major, must meet the conditions of Subsection 9.9.2 (b) and (d) in the event data are presented that show the emission levels listed in Subsection 9.9.3 (b) are exceeded.

- (d) Major new sources and major modifications must meet the conditions of Subsection 9.9.2 (b) and (d) and, where applicable, demonstrate that the emission offsets, when considered together with the rest of the State Implementation Plan, represent Reasonable Further Progress.

#### 9.10 Growth Allowance

9.10.1 The Growth Allowance shall be governed by the following conditions:

- (a) The Growth Allowance shall be calculated by the Department by 1 July each year based on the results of the previous year's volatile organic compound emission inventory.
- (b) The baseline year for determining the Growth Allowance shall be 1980 for volatile organic compounds.
- (c) The emissions calculated by the Growth Allowance shall be distributed on a first-come-first-served basis based on the information that is required by the application for approval of plans to construct, install or modify.
- (d) No source will be allowed to consume more than 35 percent of the remaining Growth Allowance for the year the source will begin to operate.

#### 9.11 Emission Offset Demonstration

9.11.1 An emission offset may be approved by the Director if the

applicant can present technical support to demonstrate that the overall effect of granting approval of plans to construct, install or modify:

- (a) will represent, when considered together with the rest of the State Implementation Plan, Reasonable Further Progress for those pollutants responsible for the area's nonattainment status; and
- (b) for areas designated attainment for SO<sub>2</sub>, TSP, NO<sub>2</sub> and CO will not cause a net increase in concentration above the significant levels as listed in Subsection 9.9.3 (b).

9.11.2 Emission offsets can be achieved by reducing current emissions of the source to a point below the emission limitations of regulations in effect at the time of submission of the application by:

- (a) installing additional air pollution control equipment on an existing source currently operating but considered in compliance with regulations.
- (b) initiating a process change that will result in a reduction of emissions.
- (c) applying fugitive emission control measures that reduce actual emissions to less than is allowed by applicable regulations in effect at the time of application.
- (d) switching to a different type of fuel that will result in an emission rate in effect at the time of

application, if the applicant can demonstrate that:

(1) an adequate long-term supply of the new fuel is available; or

(2) the use of a specified alternative air pollution control measure would achieve the same degree of emission control in the event the source should switch to the original fuel at a later date.

(e) permanently curtailing production or operating hours below levels that are specified in an operating permit issued by the Department.

(f) permanently shutting down a facility, process or a source of emissions that is included in the state emissions inventory.

(g) establishing and supporting employer business travel control measures or employee commuter travel control measures that have quantifiable emission reductions that must be enforceable and not be already required by the Transportation Element of the State Implementation Plan.

(h) adopting any other measures that can be used for emission offsets that have been approved by the Director.

9.11.3 Offset credit will not be given for the following:

(a) Emission reductions that result from complying with existing or new rules and regulations, new source



performance standards, and national emission standards for hazardous air pollutants promulgated by the Department or the U.S. Environmental Protection Agency.

- (b) Increasing the stack height of a source beyond good engineering practice as defined by the U.S. Environmental Protection Agency.
- (c) The reduction of different pollutants, e.g. an increase in TSP emissions cannot be offset by a reduction of SO<sub>2</sub> emissions.
- (d) Process changes whereby materials that exhibit low photochemical reactivity are substituted for materials having higher photochemical reactivity.
- (e) Reductions of volatile organic compound emissions from 1 November to 31 March of any year to substitute for emission increases that occur during the rest of the year.
- (f) Emission reductions that occurred prior to 7 August 1977.

9.11.4 The following sources shall be exempt from the emission offset requirements:

- (a) Resource recovery facilities burning municipal solid wastes.
- (b) Pilot plants and portable facilities that will be in operation for less than six consecutive months.
- (c) Facilities utilizing alternative fuels in existing fuel burning equipment such that:

- (1) the equipment was capable of burning such fuel before 21 December 1976; or
- (2) the equipment must use such fuel by reason of an order in effect under Section 2 (a) and (b) of the Energy Supply and Environmental Coordination Act of 1974 (15 USC 791 et seq.), or under any superseding legislation, or by reason of a natural gas curtailment plan in effect pursuant to the Federal Power Act (16 USC 460 et seq.); or
- (3) the alternative fuel is to be used by reason of an order or rule issued under the provisions of Section 125 of the Clean Air Act as amended August 1977 (42 USC 7425).

9.11.5 Emission offsets achieved by shutting down an existing source or permanently curtailing production or operating hours below levels specified in the operating permit may be credited provided that:

- (a) The work force to be affected has been notified of the proposed shutdown or curtailment; and
- (b) The applicant can establish that it shut down or curtailed production less than one year prior to the date of the permit application; and
- (c) The proposed new source is a replacement for the shutdown or curtailment.

## 9.12 Banking of Emissions

9.12.1 The Director may credit a source with emission reductions that may be used at a later date for the purposes of meeting the emission offset provisions of Subsections 9.9.2 (b) and 9.9.3 (c) or 9.9.3 (d).

9.12.2 Emission reductions may not be banked by a source without prior approval of the Director and will be subject to the following conditions:

- (a) A request for banking emission reductions must be backed with technical information that demonstrates the nature of these reductions.
- (b) Emission reductions achieved prior to 7 August 1977 will not be subject to banking.
- (c) Emission reductions achieved during the time period between 7 August 1977 and the effective date of this regulation may be banked providing the source can present to the Director an adequate demonstration of emission reductions.
- (d) Emission reductions achieved after the effective date of this regulation may be banked if a request is submitted to the Director within six (6) months of the emission reduction.
- (e) Emission reductions shall be included as a condition of the construction and the operating permits.
- (f) Emission reductions must be achieved by a manner outlined in Subsection 9.11.2.

9.12.3 The Director shall credit a source with emission reductions to be banked using the following expression:

$$A = B (1 - C (D/E))$$

where A = emission reductions eligible to be banked (tons)

B = proposed emission reductions (tons)

C = percent reduction needed to meet the national ambient air quality standards in the year when the emission reduction was implemented (Z)

D = the number of months an emission reduction will be in effect prior to the projected attainment date that is being used in the current State Implementation Plan (months)

E = the number of months that is projected to attain standards (months)

9.12.4 The Director shall notify the source of the approved emission reductions that are banked and that emission reductions will not be reduced due to future changes in the percent reduction needed to meet standards.

9.12.5 The Director shall maintain a file of approved banked emissions. The file shall be available for inspection during normal office hours given adequate notice.

9.12.6 Emission reductions may not be transferred unless approved in writing in advance by the Director.

9.13 Attainment or Unclassifiable Areas: Standards for Approval to Construct, Install or Modify (PSD)

9.13.1 Applications for major stationary sources or major modifications in areas designated as attainment or

unclassifiable with respect to the particular pollutant being emitted must demonstrate that the following conditions will be met:

(a) Best Available Control Technology

- (1) A new major stationary source shall apply BACT for each pollutant it would have the potential to emit.
- (2) A major modification shall apply BACT for each pollutant for which there would be a net emissions increase at the source.

(b) Air Quality Impact Analysis

- (1) The owner or operator of the proposed source or modification shall demonstrate, by means of air quality modeling based on the applicable air quality models, data bases and other requirements specified in the EPA Guideline on Air Quality Models, that allowable emission increases from the proposed source or modification, in conjunction with all other applicable emission increases or decreases (including secondary emissions), would not cause or contribute to:
  - a. air pollution in violation of any national ambient air quality standard; or
  - b. any increase in ambient concentrations exceeding the remaining available increment for the specified air contaminant.

(c) Additional Impact Analysis

- (1) The owner or operator shall provide an analysis of the impairment to visibility, soils, and vegetation that would occur as a result of the source or modification and general commercial, residential, industrial and other growth associated with the source or modification.
- (2) The owner or operator shall provide an analysis of the air quality impact projected for the area as a result of general commercial, residential, industrial and other growth associated with the source or modification.

9.14 Air Quality Impact Analysis

9.14.1 The air quality impact analysis prepared in fulfillment of the requirements of Subsection 9.13.1 (b) shall include the following:

- (a) An analysis of ambient air quality in the area that the major stationary source or major modification would affect for each of the following pollutants:
  - (1) For the source, each pollutant that it would have the potential to emit in a significant amount;
  - (2) For the modification, each pollutant for which it would result in a significant net emissions increase.
- (b) The analysis shall include ambient air monitoring

data that has been gathered over a period of one year and shall represent the year preceding submission of the application. Ambient air monitoring data collected for a time period of less than one year (but not less than four months) or for a time period other than the year immediately preceding submission of the application may be acceptable if such data is adequate for determining whether the source or modification will cause or contribute to a violation of any applicable national ambient air quality standard or consume more than the remaining available increment.

- (c) For any pollutant for which no National Ambient Air Quality Standard exists, the analysis shall contain such air quality monitoring data as the Director determines is necessary to assess ambient air quality for that pollutant in any area that the emissions of that pollutant would affect.
- (d) Ambient air monitoring data will not be required if:
  - (1) the emissions increase of the pollutant from a new stationary source or the net emissions increase of the pollutant from a modification would cause air quality impacts less than the following amounts:

Carbon monoxide.....575 ug/m<sup>3</sup>, 8-hr avg.  
 Nitrogen dioxide.....14 ug/m<sup>3</sup>, ann. avg.  
 Total suspended  
 particulates.....10 ug/m<sup>3</sup>, 24-hr avg.  
 Sulfur dioxide.....13 ug/m<sup>3</sup>, 24-hr avg.  
 Lead.....0.1 ug/m<sup>3</sup>, 24-hr avg.  
 Mercury.....0.25 ug/m<sup>3</sup>, 24-hr avg.  
 Beryllium.....0.0005 ug/m<sup>3</sup>, 24-hr avg.  
 Fluorides.....0.25 ug/m<sup>3</sup>, 24-hr avg.  
 Vinyl chloride.....15 ug/m<sup>3</sup>, 24-hr avg.  
 Total reduced sulfur.....10 ug/m<sup>3</sup>, 1-hr avg.  
 Hydrogen sulfide.....0.04 ug/m<sup>3</sup>, 1-hr avg.  
 Reduced sulfur  
 compound.....10 ug/m<sup>3</sup>, 1-hr avg.;

or

- (2) the concentrations of the pollutant in the area that the source or modification would affect are less than the concentrations listed above.
- (e) Upon request, the owner or operator shall provide information on:
- (1) the air quality impact of the source or modification including meteorological and topographical data necessary to estimate such impact; and
  - (2) the air quality impacts and the nature and extent of any or all general commercial, residential, industrial and other growth which



has occurred since 7 August 1977, in the area  
the source or modification would affect.

#### 9.15 Increment Consumption

9.15.1 Increment consumption shall be governed by the following  
conditions:

- (a) No source or modification will be allowed to consume more than 75 percent of the remaining 24-hour increment or 25 percent of the remaining annual increment.
- (b) All State Implementation Plan revisions or relaxations that consume increment must begin actual construction or begin operation at the increased emission rate, if no construction is necessary, within eighteen (18) months of final approval of the State Implementation Plan revision or relaxation.

If actual construction or operation has not begun within eighteen (18) months, a revised air quality impact analysis meeting the requirements of Sections 9.13 (b) and 9.14.1 (a) through (e) shall be submitted prior to actual construction or operation.

This revised air quality impact analysis shall take into account actual emission increases and decreases at any stationary source that occurred after the original air quality impact analysis had been submitted.

The Director may revoke the State Implementation Plan revision or relaxation, following the procedure in Subsection 9.5.2, if the revised air quality impact analysis shows that allowable emission increases from the State Implementation Plan revision or relaxation, in conjunction with all other applicable emission increases or decreases, would cause or contribute to:

- (1) air pollution in violation of any national ambient air quality standard; or
- (2) any increase in ambient concentrations exceeding the remaining available increment for the specified air contaminant.

(c) The following concentrations shall be excluded in determining increment consumption:

- (1) Concentrations attributable to the increase in emissions from stationary sources which have converted from the use of petroleum products, natural gas, or both by reason of an order in effect under Sections 2 (a) and (b) of the Energy Supply and Environmental Coordination Act of 1974 (or any superseding legislation) over the emissions from such sources before the effective date of such an order:
- (2) Concentrations attributable to the increase in

emissions from sources which have converted from using natural gas by reason of natural gas curtailment plan in effect pursuant to the Federal Power Act over the emissions from such sources before the effective date of such plan;

(3) No exclusion of concentrations referred to in Sections (1) or (2) shall apply more than five years after the effective date of the conversion;

(4) Concentrations of particulate matter attributable to the increase in emissions from construction or other temporary emission-related activities of new or modified sources;

(5) Concentrations attributable to the temporary increase in emissions of sulfur dioxide or particulate matter from stationary sources which are affected by State Implementation Plan revisions meeting the following criteria:

a. The duration of the State Implementation Plan revision shall not exceed thirty (30) months; and

b. The duration of the exclusion is not renewable; and

c. The emissions increase from the source would not cause or contribute to the

violation of a national ambient air quality standard or impact an area where an applicable increment is known to be violated; and

- d. At the end of the State Implementation Plan revision, the emission levels from the source shall not exceed those levels occurring before the State Implementation Plan revision was approved.

#### 9.16 Applicability Exemptions

9.16.1 The requirements of Section 9.13 shall not apply to a major stationary source or major modification if:

- (a) The source or modification would be a major stationary source or major modification only if fugitive emissions, to the extent quantifiable, are considered in calculating the potential to emit of the stationary source or modification and such source is not one of the 28 named source categories identified in the definition "major stationary source" for attainment or unclassifiable areas; or
- (b) The source or modification is a portable stationary source which has previously received a permit under the requirements of Section 9.13; and if
  - (1) the source proposes to relocate and the emissions from the source at the new location would be temporary; and

- (2) the emissions from the source would not exceed its allowable emissions; and
- (3) the emissions from the source would impact no area where an applicable increment is known to be violated; and
- (4) reasonable notice is given to the Director prior to the proposed relocation identifying the proposed new location and the probable duration of operation at the new location. Such notice shall be given to the Director not less than thirty (30) days in advance of the proposed relocation.

9.16.2 The requirements of Subsection 9.13.1 (b) and (c) shall not apply to a major stationary source or major modification if, with respect to a particular pollutant, the allowable emissions of that pollutant from a new source, or the net emissions increase of that pollutant from a modification would be temporary and impact no area where an applicable increment is known to be violated.

#### 9.17 Phased Construction Projects

9.17.1 For phased construction projects, the determination of best available control technology shall be reviewed and modified as appropriate at the least reasonable time which occurs no later than eighteen (18) months prior to commencement of construction of each independent phase of the project. At such time, the owner or operator of the

applicable stationary source may be required to demonstrate the adequacy of any previous determination of best available control technology for the source.

#### 9.18 Stack Heights

9.18.1 The degree of emission limitation required for control of any air pollutant under these regulations shall not be affected in any manner by:

- (a) so much of a stack height, not in existence before 31 December 1970, as exceeds good engineering practice; or
- (b) any other dispersion technique not implemented before then.

#### 9.19 Post Construction Monitoring

9.19.1 The owner or operator of a major stationary source or modification shall, after construction of the source or modification, conduct such ambient monitoring as the Director determines is necessary to determine the effect emissions from the source or modification may have or are having on air quality.

9.19.2 Monitoring conducted for the purposes of satisfying Subsections 9.14.1 (b) and 9.19.1 shall meet the requirements of Appendix B to 40 CFR Part 58.

#### 9.20 Relaxations

9.20.1 At such time that a particular source or modification becomes a major stationary source or major modification solely by virtue of a relaxation in any enforceable

limitation which was established after 7 August 1980 on the capacity of the source or modification otherwise to emit a pollutant, such as a restriction on hours of operation, then the requirements of Section 9.13 shall apply to the source or modification as though construction had not yet commenced on the source or modification.

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
 DIVISION OF WATER RESOURCES — FRESH WATER WETLANDS SECTION  
 83 PARK STREET  
 PROVIDENCE, RHODE ISLAND 02903

Application No. \_\_\_\_\_

PRELIMINARY DETERMINATION APPLICATION

PROCESSING FEE: \$30.00

A P P L I C A N T	APPLICANT NAME _____ DOING BUSINESS AS _____ MAILING ADDRESS _____ CITY/TOWN _____ STATE _____ ZIP _____ PHONE NUMBER (____) _____ Area Code      Number	REQUEST FOR (Please check) Wetland _____ Determination _____ Review of Proposed _____ Site Alterations _____
O W N E R	OWNER'S NAME _____ DOING BUSINESS AS _____ ADDRESS _____ CITY/TOWN _____ STATE _____ ZIP _____ Signature of Owner (signature not necessary if signed letter of authorization has been provided) _____ Date _____	
S I T E I N F O	CITY/TOWN OF LOCATION _____ LOCATION OF SITE TO BE INSPECTED _____ TAX ASSESSOR'S PLAT AND LOT NO(S) _____ STREET ABUTTING SITE _____ DIRECTION TO SITE FROM ABUTTING STREET    ___ East ___ West ___ North ___ South NEAREST STREET INTERSECTION & DIRECTION FROM SITE _____ NEAREST UTILITY POLE NUMBER _____ HAS SITE BEEN FLAGGED (Yes/No) _____	
	BRIEF DESCRIPTION AND PURPOSE OF PROJECT _____ <div style="text-align: right;">                     ANY PREVIOUS APPL. FOR THIS SITE?                      IF YES PROVIDE APPLICATION NO.                      APPLICATION NO. _____                      ANY PREVIOUS COMPLAINT OR VIOLATION                      FOR THIS SITE? IF YES PROVIDE                      COMPLAINT NUMBER _____                      HAS THIS APPLICATION BEEN SUBMITTED                      IN RESPONSE TO A CONSENT AGREEMENT?                      YES/NO _____                 </div>	

I hereby certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information under the authority of the General Laws of 1956.

\_\_\_\_\_  
Applicant Signature

\_\_\_\_\_  
Date



PRELIMINARY DETERMINATION APPLICATION

FRESH WATER WETLANDS APPLICATION PACKAGE

This application package is provided to aid you in completing the Fresh Water Wetlands Applicability Determination Form

The application form must be completed by all persons applying for a Determination or an Alteration under DEM's Fresh Water Wetlands Program. All applications should be submitted to the following address:

R.I. Department of Environmental Management  
Fresh Water Wetlands Section  
83 Park Street, Second Floor  
Providence, R.I. 02903

**\*\*FAILURE TO PROVIDE ALL REQUESTED INFORMATION WILL\*\***  
**\*\* DELAY THE PROCESSING OF YOUR APPLICATION \*\***

PROCESSING FEE: \$30.00 (Thirty Dollars)

Make Check Payable to: R.I. General Treasurer

REV 12/86

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INSTRUCTIONS FOR COMPLETING THE PRELIMINARY APPLICATION FORM

NOTE: Unless otherwise specified, each item must be answered on the form. If a particular item does not fit the circumstances or characteristics of your activity, indicate by entering NA (Not Applicable). Please type or print on the lines provided.

THIS FORM MUST BE FILLED OUT COMPLETELY OR THE APPLICATION WILL BE RETURNED; THEREBY DELAYING THE PROCESSING OF YOUR APPLICATION.

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APPLICANT SECTION — Fill in the following information:

- name of person applying
- business
- mailing address
- phone number for daytime hours

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REQUEST

Wetland Determination Only

The Department of Environmental Management will determine if freshwater wetlands are present on the property in question.

Refer to the enclosed freshwater wetlands application checklist — Section I for required enclosures for this type of application. DO NOT SUBMIT PLANS INDICATING PROPOSED SITE ALTERATIONS for this type of request.

Note regarding Wetland delineations — When requested, the Department will confirm the correctness of a wetland edge delineation made by the applicant. The Department will not, however, identify the wetland edge for the applicant. Confirmation of a wetland edge may be accomplished under procedures listed in Section I fo the checklist.

Review of Proposed Site Alterations

The Department will review proposed site alterations of any and all types which may be proposed on your property. This review will determine the following:

- a. Whether or not there is a wetland present and if the Act applies to the proposed site alteration;
- b. Whether or not the proposed site alterations represents a significant alteration to the wetland present and/or;
- c. Whether the proposed site alterations may be approved without the need of a formal permit or must be reviewed through the Department's formal permit process.

If you are proposing site alterations or changes to your property, refer to the enclosed freshwater wetlands application checklist — Section II for required enclosures for this type of application.

OWNER SECTION - fill in the following information:

- name of the property owner
  - business
  - mailing address
  - signature of owner is not necessary if signed letter of authorization is provided.
- 

SITE LOCATION SECTION - Be as descriptive as possible when filling out this section.

- city/town in which the subject property is located;
- tax assessor's plat and lot numbers;
- street abutting the site & direction (north, south, east, or west) from the street;
- nearest street intersection and direction from site;
- nearest utility pole number.

THE SITE MUST BE FLAGGED FOR ANY REQUESTS FOR WETLAND ALTERATIONS.

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#### DESCRIPTION & PURPOSE OF PROJECT SECTION

Briefly describe the type of alteration/construction of the fresh water wetland. The DEM policy states that "DEM's approval of the project will be conditioned on the stated purpose and any changes in the purpose may subject the application to further review."

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#### PENALTY FOR SUBMITTING FALSE INFORMATION

Federal statutes provide for severe penalties for submitting false information on this application form.

18 U.S.C. Section 1001 provides that "Whoever, in any matter within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals or covers up by any trick, scheme, or device a material fact, or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statement or entry, shall be fined not more than \$10,000 or imprisoned not more than five years, or both."

SECTION I

REQUIREMENTS FOR WETLAND DETERMINATION ONLY

Application Fee: A thirty (30) dollar check or money order payable to: R. I. General Treasurer

triplicate (3) site drawings: size 8 1/2" X 11" minimum, 24" X 36" maximum

Title Block must appear on drawing and contain the following:

- \_\_\_\_\_ name
- \_\_\_\_\_ street
- \_\_\_\_\_ tax assessor's plat number
- \_\_\_\_\_ lot number (s)
- \_\_\_\_\_ city/town
- \_\_\_\_\_ date
- \_\_\_\_\_ scale

Scale of drawings must be no smaller than 1" = 100'.  
(larger scale preferred, e.g. 1" = 40')

Drawing must show the following information:

- \_\_\_ street abutting site with nearest Utility Pole No.
- \_\_\_ distance & direction to nearest street intersection
- \_\_\_ magnetic north arrow
- \_\_\_ property boundary outline
- \_\_\_ insert map showing location of site in community
- \_\_\_ fixed reference points indicated below:
  - \_\_\_ streams
  - \_\_\_ stone walls
  - \_\_\_ buildings
  - \_\_\_ fences
  - \_\_\_ edge of fields/woods
  - \_\_\_ trails
  - \_\_\_ parking lots
  - \_\_\_ approximate wetland locations if suspected

Topographic survey at no more than two (2) foot contour intervals

This is very helpful on large pieces of property. It is not required in all situations.

Confirmation of Wetland Delineations

Wetland edge must be flagged in the field with flags or markers numbered or lettered consecutively.

A site drawing, designed in accordance with the requirements above, must be provided which indicates the wetland edge and all numbered or lettered reference markers.

SECTION II

REQUIREMENTS FOR PROPOSED SITE ALTERATIONS AND CHANGES

\_\_\_\_\_ Application Fee: A thirty (30) dollar check or money order payable to: General Treasurer

\_\_\_\_\_ Triplicate (3) site plans: size 8 1/2" X 11" minimum, 24" X 36" maximum

\_\_\_\_\_ Title block must appear on drawing and contain the following:

- \_\_\_\_\_ name/project
- \_\_\_\_\_ street
- \_\_\_\_\_ tax assessor's plat number
- \_\_\_\_\_ lot number (s)
- \_\_\_\_\_ city/town
- \_\_\_\_\_ date
- \_\_\_\_\_ scale

\_\_\_\_\_ Plans requiring more than 1 sheet must be numbered consecutively (e.g. No. 1 of 3, No. 2 of 3, etc.)

\_\_\_\_\_ Scale of plans must be drawn no smaller than 1" = 100' (larger scale preferred e.g. 1" = 40')

\_\_\_\_\_ Plan must have a legend

\_\_\_\_\_ Plans must show the following information:

- \_\_\_\_\_ street abutting site with nearest utility pole
- \_\_\_\_\_ distance and direction to nearest street intersection
- \_\_\_\_\_ magnetic north arrow
- \_\_\_\_\_ property boundary outline
- \_\_\_\_\_ WETLAND EDGE MUST BE SHOWN
- \_\_\_\_\_ WETLAND SETBACK MUST BE SHOWN (e.g. 50' from wetland vegetation, 100' from stream <10' wide, and 200' from stream >10' wide)
- \_\_\_\_\_ insert map showing location of site in the community
- \_\_\_\_\_ fixed reference points as indicated below:
  - \_\_\_\_\_ rivers (width shown from scoured edge)
  - \_\_\_\_\_ intermittent streams
  - \_\_\_\_\_ stone walls
  - \_\_\_\_\_ buildings
  - \_\_\_\_\_ fences
  - \_\_\_\_\_ edge of fields/woods
  - \_\_\_\_\_ trails
  - \_\_\_\_\_ parking lots
  - \_\_\_\_\_ floodplain limit (100-year frequency storm)

\_\_\_\_\_ Proposed Filling and Excavation must be addressed by providing:

\_\_\_\_\_ \*Topographic contour line elevations at 2' intervals (1' intervals preferred) to include both of the following:

- \_\_\_\_\_ existing contour line elevation
- \_\_\_\_\_ proposed contour line elevation

\*If this application is being submitted in an attempt to resolve a violation, existing contours must reflect, as closely as possible, conditions PRIOR TO FILLING. Proposed contours must reflect the conditions you are seeking approval for.

\_\_\_\_\_ Specific notes must be provided on the plan indicating no grade changes are required to carry out the alteration (if filling is not proposed)

\_\_\_\_\_ location and contour elevation of the 100-year flood line (mean sea level)

\_\_\_\_\_ proposed limits of all vegetative clearing and surface disturbance

\_\_\_\_\_ all temporary and permanent erosion/sediment controls must be shown (e.g. staked haybales, silt fences, log/hay dams, loam/seed, rip-rap, mulch, plantings)

#### FIELD WORK TO BE PERFORMED:

This work must be completed prior to application submission regarding "proposed" work

\_\_\_\_\_ boundary of proposed limits of filling, clearing and soil disturbance must be flagged

\_\_\_\_\_ pond, retention/holding basins must be outlined by flagging and/or otherwise clearly marked

\_\_\_\_\_ subdivision lots must be clearly numbered

\_\_\_\_\_ The following must be staked and marked:

\_\_\_\_\_ corner locations of proposed structures

\_\_\_\_\_ corner locations of proposed septic systems

\_\_\_\_\_ Centerlines of roadways and pipelines must be flagged (distance between flags should be no greater than 100')

\_\_\_\_\_ Drainage swale centerlines must be flagged

SITE PLAN REQUIREMENTS FOR SPECIFIC CONSTRUCTION PROJECTS

Building Construction

Site plans should include the following:

- \_\_\_\_\_ outline & location of all proposed buildings, docks, pool, tennis courts, parking lots, etc.
- \_\_\_\_\_ driveway or access road outline and location
- \_\_\_\_\_ septic system
- \_\_\_\_\_ sewerlines
- \_\_\_\_\_ subdrains
- \_\_\_\_\_ utility lines to include:
  - \_\_\_\_\_ gas
  - \_\_\_\_\_ water
  - \_\_\_\_\_ electric
  - \_\_\_\_\_ telephone
  - \_\_\_\_\_ limits of filling and/or excavation by showing existing and proposed contours at 2' intervals or less.

\_\_\_\_\_ Specific note if grade changes are not proposed must be on the plan

Site plans must show the limits of the following alterations:

- \_\_\_\_\_ clearing
- \_\_\_\_\_ grading
- \_\_\_\_\_ soil disturbance
- \_\_\_\_\_ landscaping
- \_\_\_\_\_ appropriate erosion/sediment controls

Subdivision Development

Site plans should include the following:

- \_\_\_\_\_ proposed roadways and lots
- \_\_\_\_\_ proposed culverts, subdrains, drainage systems, swales, discharges, sewers, retention basins
- \_\_\_\_\_ proposed structures, driveways, septic systems
- \_\_\_\_\_ proposed limits of all clearing, grading, soil disturbance landscaping
- \_\_\_\_\_ proposed utility lines (gas, water, electric, telephone)
- \_\_\_\_\_ proposed discard sites for soil, stumps, trees, rocks, boulders
- \_\_\_\_\_ cross sections and profiles of roadways over watercourses and wetlands
- \_\_\_\_\_ existing and proposed contours at 2' contour intervals
- \_\_\_\_\_ appropriate erosion/sediment controls



## Pond Excavation or Dredging

\_\_\_\_\_ Site plans should include the following:

- \_\_\_\_\_ proposed pond site and outline
- \_\_\_\_\_ method of excavation or dredging
- \_\_\_\_\_ cross section of pond showing depth and side slopes
- \_\_\_\_\_ soil profile to within a foot below proposed pond bottom
- \_\_\_\_\_ location and outline of spoil disposal site with existing and proposed contours at 2' intervals
- \_\_\_\_\_ existing and proposed contours about the pond
- \_\_\_\_\_ proposed dam, weir, spillway, in detail
- \_\_\_\_\_ proposed water elevation
- \_\_\_\_\_ appropriate erosion/sediment controls

\*Note: Construction of a dam will require submission of an application to the Dams Safety Section, Division of Land Resources

## Road or Driveway Construction

- \_\_\_\_\_ proposed limits of all clearing, grading, soil disturbance, filling
- \_\_\_\_\_ material to be used for construction
- \_\_\_\_\_ type of paving if any
- \_\_\_\_\_ depth of excavation to remove unsuitable material
- \_\_\_\_\_ deposition site for excavated material
- \_\_\_\_\_ culverts, drainage systems, runoff swales (see engineering requirements)
- \_\_\_\_\_ waterline, sewerline, other pipeline installations
- \_\_\_\_\_ existing and proposed contours at 2' contour intervals or less
- \_\_\_\_\_ cross sections and profiles to scale
- \_\_\_\_\_ appropriate erosion/sediment controls both temporary and permanent

## Replanting

Where clearing, grading, filling, excavation (such as compensation excavation to replace lost flood storage area in flood plains adjacent to rivers) and soil disturbance is called for adjacent to wetlands and in vegetated habitat, it is highly desirable for your project to mitigate such losses of vegetated areas by replanting. Such replanting helps to mitigate the loss of wildlife habitat and to "buffer" impacts to other values associated with the wetland ecosystem. Your plan, if incorporating such measures, should include the following:

- \_\_\_\_\_ Total area of section to be replanted must be shown on the plan
- \_\_\_\_\_ Type of soil to be utilized for planting following disturbance
- \_\_\_\_\_ Species of grass mix to be used to establish soil stabilization and long term maintenance of disturbed soil
- \_\_\_\_\_ Types of shrubs and trees to be replanted including:
  - \_\_\_\_\_ heights of plants
  - \_\_\_\_\_ densities of plants
  - \_\_\_\_\_ species of plants
  - \_\_\_\_\_ time of year for planting
  - \_\_\_\_\_ will plants be replaced if not surviving at least 1 growing season?

## ENGINEERING REQUIREMENTS

If you are proposing changes in the drainage/runoff characteristics of an area (e.g. piping of river/streams, collection and discharge of surface drainage into a wetland, paving of large areas of watershed contributing to a wetland, etc.), you must have a REGISTERED PROFESSIONAL ENGINEER prepare the applicable requirements below:

### Drainage Effects

#### Culverts: for Rivers and Intermittent Streams

\_\_\_\_\_ a narrative defining anticipated impacts of installation including reference to local flooding problems.

- \_\_\_\_\_ must be designed to accommodate at least a 10-year frequency storm (recommended - 25 year storm)
- \_\_\_\_\_ system design drawing (with cross sections and profiles)
- \_\_\_\_\_ math computations and reference materials used;
- \_\_\_\_\_ flow rates -- existing/proposed
- \_\_\_\_\_ assumptions and conclusions
- \_\_\_\_\_ watershed areas & outline of watershed to culvert
- \_\_\_\_\_ charts and graphs marked for specific application
- \_\_\_\_\_ culvert size, type, material, slope, and inverts
- \_\_\_\_\_ rip-rap design details (must be adequate size to withstand expected velocities)
- \_\_\_\_\_ entrance/discharge structures
- \_\_\_\_\_ stream bottom elevation
- \_\_\_\_\_ culvert set below stream bottom to allow fish passage
- \_\_\_\_\_ erosion/sediment controls

#### Increases in Storm Water Runoff

- \_\_\_\_\_ engineering evaluation of peak discharge
- \_\_\_\_\_ volumes to be discharged (existing and proposed) based upon a 10-year frequency storm
- \_\_\_\_\_ velocity (existing and proposed) based upon a 10-year frequency storm
- \_\_\_\_\_ consideration of local flooding and rise of water elevation in the wetland
- \_\_\_\_\_ percolation structures

\_\_\_\_\_ Design of the holding pond for retention/detention basins to include:

- \_\_\_\_\_ primary release system
- \_\_\_\_\_ emergency spillway
- \_\_\_\_\_ dike details/cross-section
- \_\_\_\_\_ hydrograph of inputs and outputs vs. time(hours)

Holding Ponds/Retention Basins (Cont'd)

- \_\_\_\_\_ Math computations and reference materials used
- \_\_\_\_\_ Outline of watershed to basin design to retain at least a 10-year frequency storm \*(areas of known flooding at a lesser frequency must be considered.)
- \_\_\_\_\_ Engineer must submit a narrative defining anticipated impacts comparing existing and proposed conditions especially referring to local flooding problems
- \_\_\_\_\_ Appropriately designed erosion/sediment controls (e.g. rip rap, flow diffusers, stabilizing vegetation, check dams, etc.)
- \_\_\_\_\_ Engineering requirements on site plan must include:
  - \_\_\_\_\_ size
  - \_\_\_\_\_ area
  - \_\_\_\_\_ capacity
  - \_\_\_\_\_ cross section
  - \_\_\_\_\_ outfalls
    - \_\_\_\_\_ primary
    - \_\_\_\_\_ emergency
  - \_\_\_\_\_ spillways
    - \_\_\_\_\_ primary
    - \_\_\_\_\_ emergency
  - \_\_\_\_\_ inlet/outlet types
  - \_\_\_\_\_ invert elevations of pipes
  - \_\_\_\_\_ sizes and types of pipes
  - \_\_\_\_\_ erosion/sediment controls for:
    - \_\_\_\_\_ interior embankments
    - \_\_\_\_\_ exterior embankments
- \_\_\_\_\_ Maintenance schedule
- \_\_\_\_\_ Existing and proposed contours at 2' contour intervals

Municipal or Private Sewer Installations

- \_\_\_\_\_ Existing and proposed contours at 2' intervals
- \_\_\_\_\_ Profile and cross sections
- \_\_\_\_\_ Temporary culverts or diversions on stream crossings
- \_\_\_\_\_ Construction sequence
- \_\_\_\_\_ Appropriate erosion and sediment controls including controls for dewatering
- \_\_\_\_\_ Engineer must assure no interception /relocation of groundwater and/or streams/rivers
- \_\_\_\_\_ Math computations and reference materials used

## Subdrain Installation

- \_\_\_\_\_ Existing and proposed contours at 2' contour intervals (1' intervals preferred)
- \_\_\_\_\_ Profile
- \_\_\_\_\_ Size, type of pipe
- \_\_\_\_\_ Discharge structure and location
- \_\_\_\_\_ Engineer must submit a narrative defining anticipated impacts to adjacent wetland areas
- \_\_\_\_\_ Appropriate erosion/sediment controls
- \_\_\_\_\_ Math computations and reference materials used

## Flood Plain Effects

Department policy requires zero displacement of flood storage capacity and no detrimental obstructions in floodway to avoid significant increases in the base flood elevation.

written statement defining flood elevation during a 100-year frequency storm from the following:

- \_\_\_\_\_ U.S. Army Corps of Engineers
- \_\_\_\_\_ Soil Conservation Services
- \_\_\_\_\_ U.S. Geological Survey
- \_\_\_\_\_ Federal Emergency Management Agency
- \_\_\_\_\_ Registered Professional Engineer's Study

\_\_\_\_\_ Application should include:

- \_\_\_\_\_ Identification of 100-year base flood boundary with elevation
- \_\_\_\_\_ Fill volumes & excavation compensation
- \_\_\_\_\_ Erosion/sediment controls
- \_\_\_\_\_ Math computations & reference materials used
- \_\_\_\_\_ Assumptions and conclusions
- \_\_\_\_\_ Identification of floodway changes and impact expected
- \_\_\_\_\_ Lowest floor elevation
- \_\_\_\_\_ design drawing with 2' contour intervals for existing/proposed contours

## Engineering Criteria for Water Quality

Department policy requires that the proposed alteration have no detrimental affect on the water quality of the subject wetlands.

\_\_\_\_\_ Application must address the following:

- \_\_\_\_\_ sedimentation
- \_\_\_\_\_ chemical pollutants (eg.lead, hydrocarbons, etc.)

- \_\_\_\_\_ Water flows
- \_\_\_\_\_ Sedimentation basins
- \_\_\_\_\_ Ground water table
- \_\_\_\_\_ Wetlands water classification
- \_\_\_\_\_ Stormwater treatment system
- \_\_\_\_\_ Recommended maintenance schedule of proposed system
- \_\_\_\_\_ Appropriate erosion/sediment controls

\_\_\_\_\_ Limits of the following:

- \_\_\_\_\_ grading
- \_\_\_\_\_ clearing
- \_\_\_\_\_ soil disturbance
- \_\_\_\_\_ equipment operation

\_\_\_\_\_ Drainage Swale Requirements:

- \_\_\_\_\_ Must be designed to accommodate at least a 10-year frequency storm
- \_\_\_\_\_ Cross sections and profile
- \_\_\_\_\_ Plan view
- \_\_\_\_\_ Appropriate erosion/sediment controls
- \_\_\_\_\_ Math computations and reference materials used

## DESIGN HINTS FOR ALL PROJECTS

AVOID filling of wetlands. This is regarded as an immediate significant alteration requiring that you obtain a FORMAL PERMIT for your project.

AVOID channelization/relocation of rivers as this is also deemed a significant alteration.

Try to keep proposed culverts/piping to minimum necessary lengths. We suggest that culverts not exceed 50 feet in length in road crossings over streams. However, this is no guarantee that a Formal permit will not be required.

Uncompensated loss of flood storage will require a FORMAL PERMIT.

Pond proposed in bogs and most marshes will require a FORMAL PERMIT. Ponds should be designed adjacent to these wetlands, if possible.

ALWAYS attempt to protect and maintain as much existing vegetation in upland areas adjacent to wetlands as possible. Significant loss of vegetated "buffer" zones are likely to require a FORMAL PERMIT.

IF YOU HAVE ANY QUESTIONS REGARDING THESE REQUIREMENTS,  
CONTACT THE FRESH WATER WETLANDS SECTION AT (401) 277-6820.

## GLOSSARY

Act - the term 'Act' shall mean Sections 2-1-18 through 2-1-27 inclusive of the General Laws of 1956, as amended.

Alter, Alteration - the terms "Alter" (verb) and "Alteration" (noun) shall include, but not be limited to, excavation; drain installation; filling; drainage discharge; directing effluents or surface water flows into or out of; grading; diking; damming; diverting; adding to or taking from; or otherwise changing the character of any fresh water wetland.

a) Activities conducted outside of wetland areas shall be considered alterations of the wetland if such activities directly affect the ability of the wetland to moderate flooding, provide wildlife habitat, recharge the groundwater supply, or provide recreation. Such activities shall include:

- 1). Interception of ground or surface water (e.g., by surface or subsurface drain installation) feeding a fresh water wetland.
- 2). Conducting earth work which causes sediments to enter a fresh water wetland.

b) Activities which will not under normal circumstances be considered alterations shall include:

- 1). Selective tree cutting where no disruption of soil stability or existing topography is allowed.
- 2). Continuing agricultural practices (e.g., planting, cultivating, or grazing existing fields).
- 3). Brush and footpath cutting where no physical changes in topography are allowed.
- 4). Performing maintenance to existing structures where no physical changes to the structure are proposed.
- 5). Manual removal of debris or accumulated matter foreign to the wetland or stream channel where no changes in cross section or profile are allowed.

Applicant - shall mean the person, firm, partnership, corporation or government agency applying for approval to alter a fresh water wetland



or seeking determination concerning the applicability of the Act, and shall be limited to the owner of the subject property (including a leaseholder or purchaser under written purchase or sales agreement), or the agent of the owner or interest-holder with written authorization to submit an application.

Areas Subject to Flooding - the term "Areas Subject to Flooding" shall include depressions flooded by "Areas Subject to Storm Flowage: (as defined in Section 2.05) which collect, hold and/or meter our storm and flood waters; or special flood hazard areas delineated by the Department of Housing and Urban Development Federal Insurance Administration Flood Hazard Boundary Map currently administered by the Federal Emergency Management Agency (FEMA) for the cities and towns of the state, other than those areas defined as "Floodplain" in Section 2.14 of the Regulations, unless a more accurate site-specific study has been conducted by a registered professional engineer and approved by the Director.

Areas Subject to Storm Flowage - the term "Areas Subject to Storm Flowage" shall be defined as those channel areas, intermittent streams, and water courses other than that area defined as "River" in Section 2-1-20 of the Act which carry storm, surface, groundwater discharge or drainage waters, out of, into, and/or connect fresh water wetlands as defined by Section 2-1-20 of the Act and/or coastal wetlands. Such channels shall be recognized by the evidence of scouring, or a marked change in vegetative density and/or composition.

Culvert - a drain or waterway under a road.

Dam - (verb) to permanently impound surface water to depth of three (3) feet or more above the original river bed; or (noun) any structure capable of accomplishing the above, or any structure specifically designed to permanently impound storm flows (flood control dam).

Department - the term "Department" or DEM shall mean the Department of Environmental Management.

Detention Basin - an impoundment or excavated facility which stores peak runoff and releases the runoff at a controlled rate.

Dike - any embankment or ridge of either natural or manmade materials used to prevent the movement of liquids, sludges, solids, or other materials.

Director - the director of the Department or his authorized designee.

Disapprove - the term "To Disapprove," as used in Section 2-1-21(a) of the Act, shall mean to notify the director, in writing, of an official decision of the appropriate city or town council denying approval of an application to alter a fresh water wetland.

Divert - to change a stream or river from its natural course of flow or to relocate ground- or surface water into/ out of fresh water wetlands.

Drain - shall mean to artificially lower the normal surface water and/or groundwater elevation.

Edge - the term "edge" of a wetland, as used in Section 2-1-20 of the Act, shall mean the limit of the extent of the appropriate vegetational community or physical feature which determines the existence of a given wetland.

Fill - (verb) shall mean to place dirt, stones, gravel, sand, tree stumps, solid wastes, garbage or other foreign material on or in the wetland, or (noun) the material placed in the act of filling.

Flood Plain - shall mean that land area adjacent to a river which is, on the average, likely to be covered with flood water resulting from a 100-year frequency (1% probability) storm. It shall also mean that land so designated as flood plain on the U.S. Department of Housing and Urban Development Federal Insurance Administration Flood Hazard Boundary Map, currently administered by FEMA, unless a more accurate study of the subject flood plain has been adopted by regulation by the director, or unless a more accurate site-specific study has been conducted by a registered professional engineer.

Fresh Water Wetlands - shall include but not be limited to marshes; swamps; bogs; ponds; river; river and stream flood plains and banks; areas subject to flooding or storm flowage; emergent and submergent plant communities in any body of fresh water including rivers and streams and that area of land within fifty (50) feet of the edge of any bog, swamp, or pond.

Groundwater - water below the land surface in a zone of saturation.

Insignificant Alteration - an alteration where no detrimental modification of the basic natural capabilities of a fresh water wetland will result. In assessing the impact of a proposed alteration of wetland, the director shall consider the effect of the proposed alteration on the capability of the wetland to:

- a) Moderate the velocity and volume of flood flow through storage and/or absorption;
- b) Recharge the groundwater supply;
- c) Provide wildlife habitat;
- d) provide a recreational environment.

Map Survey - a set of maps providing an approximate delineation of the types, locations, and boundaries of wetland areas, but not necessarily indicate all wetland areas.

Objection of a Substantive Nature - an objection which alleges (on the bases of representation of fact) that the proposed alteration may be of detriment to values of a wetland, including among others, the abilities of a wetland to:

- a) Moderate the velocity and volume of flood flow through storage and/or absorption;
- b) Recharge the groundwater supply;
- c) Provide wildlife habitat;
- d) Provide a recreational environment.  
and/or absorption.

The determination of whether an objection to an application for permission to alter wetlands conforms to this definition shall be made under the procedure in the Fresh Water Wetland Rules and Regulations.

Plant or Vegetational Community - an association of plants that together comprise more than 50% of the plant cover present in a given area.

Project Area - that portion of subject wetland proposed for alteration and located within the applicant's applicant's property boundaries.

Riverbank - areas within 200 feet of any body of flowing water 10 feet wide or greater. Also areas within 100 feet of any body of flowing water less than 10 feet wide as defined in the "Act".

Sediment Basin - an impoundment or excavated facility constructed in or across a waterway or runoff course, and designed to allow sediments to precipitate.

Significant Alteration - an alteration where detrimental modification of the basic natural capabilities of a fresh water wetland will result. In assessing the impact of a proposed alteration on the capability of the wetland to:

- a) Moderate the velocity and volume of flood flow through storage and/or absorption;
- b) Recharge the groundwater supply;
- c) Provide wildlife habitat;
- d) Provide a recreational environment.

Width During Normal Flow - the distance between the edges of the normal channel of the river; such normal channel being indicated by evidence of scouring and/or a marked reduction in vegetative density.

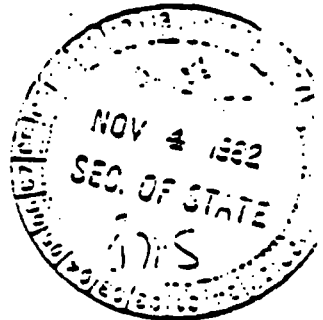
Wildlife Habitats - those fresh water wetlands that provide breeding, nursery, resting, or feeding grounds for birds, mammals, fish, reptiles, amphibians, invertebrates, or the individual plants and animals which provide food, cover, breeding sites or other life support systems for these forms of animal life.

STATE OF RHODE ISLAND  
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
DIVISION OF AIR & HAZARDOUS MATERIALS

*Not for  
affairs  
name day*

RULES AND REGULATIONS,  
FOR  
SOLID WASTE MANAGEMENT FACILITIES.

DECEMBER 1, 1982



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PART I ADMINISTRATIVE AND ORGANIZATIONAL MATTERS; DEFINITIONS

1.00 FINDINGS AND POLICY

1.01 Authority: Under the authority of the 1956 Rhode Island General Laws, Chapters 23-18.9 (1979 Reenactment), 23-19 (1979 Reenactment) and 42-17.1 (1977 Reenactment) the following Rules and Regulations are promulgated to administer those chapters as amended, and shall supersede all previous Rules and Regulations, except as provided in PART IV here

1.02 Legislative Intent and Policy: The declaration of intent and public policy enumerated by the Legislature in Sections 23-19-23-19-3 and 23-19-4, (1979 Reenactment), as amended, are hereby adopted as the administrative findings and policy upon which these regulations are based.

1.03 Administrative Findings: The following administrative findings are also made a basis for these regulations:

a) That threats to the public health and environment result in from improper solid waste management practices should be addressed in a timely and effective manner.

b) That solid waste management in Rhode Island should be undertaken with due regard to public health and safety, in an environmentally sound manner, and at the lowest possible cost to Rhode Island citizens.

c) That costs, necessity, environmental impacts, and social impacts from collection, hauling, and storage of municipal wastes receive full consideration in the development and licensing of future solid waste management facilities.

d) That contamination of water, land and air from past, present and future waste management activities be prevented to the greatest possible extent.

e) That use of resource recovery technologies is favored over land disposal technology.

1.04 Function: The primary functions of the licensing agency are to grant, deny, suspend or revoke licenses for the operation of solid waste management facilities and to grant, deny, suspend or revoke approval of the plans and specifications for the construction of solid waste management facilities and the installation of any equipment in such facilities. Any and all solid waste facilities and projects shall be subject to the regulatory and enforcement activities of the licensing agency.

These regulations are intended to minimize environmental hazards associated with the operation of solid waste transfer, resource recovery and disposal facilities. They are also designed to promote planning and implementation of solid waste management facilities where necessary and desirable throughout the state.

## 2.00 ORGANIZATION AND METHOD OF OPERATION

2.01 Organization: Sections 23-18.9-8 and 23-18.9-9 of the 1956 R.I.G.L., as amended, establishes the Department of Environmental Management as the licensing agency for solid waste management facilities. Section 42-17.1-2(p), as amended, grants the Director the authority to establish minimum standards, subject to the approval of the environmental standards board, for permissible types of refuse disposal facilities, the design, construction, operation, maintenance and location of disposal facilities. Subsection 42-17.1-2(s), as amended, authorizes the Department to issue and enforce rules, regulations and orders as may be necessary to carry out its duties. Subsection 42-17.1-2(u) authorizes the Department to give notice of alleged violations of law and to issue compliance orders where appropriate.

### 2.02 Method of Operations and Powers:

a) The licensing agency shall adopt, amend, promulgate and enforce such rules, regulations and standards with respect to all solid waste management facilities and projects to be licensed to further the accomplishment of the purposes of Chapters 23-18.9 and 23-19.

b) The licensing agency shall receive applications from applicants desirous of being licensed as a solid waste management facility or from applicants desirous of constructing such a facility or installing any equipment in such a facility. The application must be made upon forms provided by the licensing agency and shall also contain such other information as the licensing agency requires which may include affirmative evidence of ability to comply with such rules, regulations and standards as are lawfully prescribed pursuant to Chapters 23-18.9, 23-19 and 42-17.1-2.

### 2.03 Division of Air and Hazardous Materials

a) A unit of the Department of Environmental Management designated the Division of Air and Hazardous Materials shall perform all duties related to administration of these rules and regulations. Such duties include the receipt, analysis investigation and processing, of complaints, applications for licenses and approvals, conduct of inspections, and determination of violations.

b) Information, applications and other material related to these rules shall be available upon request by telephone (401 - 277-2797) or at:

Division of Air and Hazardous Materials  
Department of Environmental Management  
75 Davis Street  
Room 204  
Providence, R.I. 02903

(Hours: 8:30 a.m.  
1:30 p.m. daily  
except Saturdays,  
Sundays and Holidays)

3.00 DEFINITIONS

- 3.01 "Airport" shall mean a public-use airport open to the public without prior permission and without restrictions within the physical capacities of available facilities, as defined 40 CFR 257.3-3(e)(1)(1979).
- 3.02 "Applicant" shall mean a person seeking a new license or a license renewal for a solid waste management facility. It shall also include persons seeking to construct or add new equipment to an existing solid waste management facility.
- 3.03 "Asbestos" shall mean actinolite, amosite, anthophyllite, chrysotile, crocidolite, tremolite.
- 3.04 "Base Flood" shall mean a flood that has a 1 percent or greater chance of recurring in any year or a flood of a magnitude equalled or exceeded once in 100 years on the average over a significantly long period, as defined in 40 CFR 257.3-1(b)(1)(1979).
- 3.05 "Bird Hazard" shall mean an increase in the likelihood of bird/aircraft collisions that may cause damage to the aircraft or injury to its occupants. 40 CFR 257.3-8(e)(2)(1979).
- 3.06 "Bulky Waste" shall mean large items of solid waste such as appliances, furniture, auto parts, stumps, flottage, etc.
- 3.07 "Cell" shall mean compacted solid wastes that are completely enclosed by natural soil or cover material.
- 3.08 "Collection Station" shall mean a solid waste management facility where refuse arrives by automobile or vehicles other than collection vehicles from sites separate from the collection station for transfer to another solid waste management facility.
- 3.09 "Construction Waste" shall mean waste building material and refuse resulting from construction, remodeling and repair operations on houses, commercial buildings, pavements and other structures.
- 3.10 "Cover Material" shall mean clean soil or earth or other material approved by the Director that is used to cover compacted solid waste in a sanitary landfill.
- 3.11 "Critical Habitat" for a threatened or endangered species is defined in the Endangered Species Act, 16 U.S.C. 1532 and as may be amended.
- 3.12 "Demolition Waste" shall mean solid waste generated from the razing of buildings and other man-made structures.
- 3.13 "Department" shall mean the Rhode Island Department of Environmental Management.

- 3.14 "Destruction or adverse modification" (of a critical habitat or endangered or threatened species) shall mean a direct or indirect alteration of a critical habitat which appreciably diminishes the likelihood of the survival and recovery of threatened or endangered species using that habitat as defined in 40 CFR 257.3-2(c)(2)(1979) and as may be amended.
- 3.15 "Director" shall mean the Director of the Rhode Island Department of Environmental Management.
- 3.16 "Discharge" is defined in the Clean Water Act of 1977, 33 U.S.C. §1322(a)(9), as amended, and for the purposes of these regulations it shall include leaching.
- 3.17 "Disposal" shall mean the final disposition of waste.
- 3.18 "Dredged Material" is defined in the Clean Water Act of 1977, 33 U.S.C. §1402, as amended, and as may be amended.
- 3.19 "Endangered or Threatened Species" is defined in the Endangered Species Act, as amended, 16 U.S.C. §§1532(6), (15) and as may be amended.
- 3.20 "Facility" (See "Solid Waste Management Facility").
- 3.21 "Final Cover" shall mean cover material which will be permanently exposed to the environment.
- 3.22 "Flood Plain" is defined in the R.I. Fresh Water Wetlands 1956 R.I.G.L., as amended, Section 2-1-20, and in the "Rules and Regulations Governing the Enforcement of the Fresh Water Wetlands Act" (effective March, 1981), and as may be amended.
- 3.23 "Friable Asbestos Material" shall mean any material that contains more than 1 percent asbestos by weight and that can be crumbled, pulverized, or reduced to powder, when dry, by hand pressure.
- 3.24 "Groundwater" shall mean water collected and stored in the saturated zone beneath the ground surface.
- 3.25 "Groundwater Recharge Area" shall refer to those geohydrological areas identified as such on a map entitled "State of Rhode Island - '208' Areawide Water Quality Management Plan - Water Related Sensitive Areas" prepared by the Statewide Planning Program (project number FRC-JF-01-13).
- 3.26 "Groundwater Reservoir" shall refer to those geohydrological areas identified as such on a map entitled "State of Rhode Island - '208' Areawide Water Quality Management Plan - Water Related Sensitive Areas" prepared by the Statewide Planning Program (project numbers FRC-JF-01-13).
- 3.27 "Hazardous Waste" shall mean any waste as defined in the Rhode Island Hazardous Waste Management Act, §23-19.1-4, or in regulations adopted pursuant thereto, and as they may be amended.

- 3.28 "Impermeable Liner" shall mean a layer of natural or man-made material of sufficient thickness, density and composition so as to impede the passage of a fluid to a degree that will satisfy the standards required by the Department.
- 3.29 "Incinerator" shall mean an arrangement of chambers and equipment designed for burning solid, semi-solid or gaseous combustible waste to a gas and residue. Incinerators used only for the combustion of solid waste generated on site shall not be covered by this definition.
- 3.30 "Initial Cover" shall mean cover material that is spread and compacted on the top, side slopes and the face of compacted solid waste at least at the end of each operating day.
- 3.31 "Intermediate Cover" shall mean cover material which must resist erosion for a longer period of time because it is applied on areas where additional cells are not to be constructed for extended periods of time.
- 3.32 "Leachate" shall mean a liquid that has percolated through, or originated in solid waste and contains dissolved or suspended materials from solid waste.
- 3.33 "Licensing Agency" shall mean the Department of Environmental Management.
- 3.34 "Lift" shall mean a compacted layer of solid waste plus its overlying cover material in a sanitary landfill.
- 3.35 "Non-hazardous Liquid and Semi-Liquid Waste" shall mean any discarded material that is liquid or semi-liquid and which is not hazardous waste as defined in the Hazardous Waste Management Act, R.I.G.L. 23-19.1, or rules and regulations promulgated pursuant to such Act, and as these may be amended.
- 3.36 "Oil Spill Cleanup Debris" shall mean waste resulting from the cleanup or debris caused by spilling, depositing or placing of petroleum distillates, including but not limited to crank case oil, lubricants and hydraulic oil, penetrant oils, tramp oils, quenching oils and kerosene onto the land or waters of the State.
- 3.37 "Open Burning" shall mean the burning of any matter under such conditions that the products of combustion are emitted directly into the open atmosphere without passing through a stack or chimney.
- 3.38 "Person" shall mean an individual, firm, jointstock company, partnership, association, private or municipal corporation, government or quasi-governmental corporation, state, commission, political subdivision of a state, any interstate body, or the federal government or any agency or subdivision thereof.

- 3.39 "Pollution" shall mean the entrance or discharge of sewage as defined in the Rhode Island Water Pollution Act, 46-12-1 (1980 Reenactment), into any waters of the state including groundwaters, in such quantity, either by itself or in connection with other sewage so discharged, as to alter the physical or chemical properties or biology of said waters, including change in temperature, taste, color, turbidity or odor, and, to cause or be likely to cause damage to the public or to any person having a right to use said waters for human consumption, commercial or domestic uses, for boating, fishing or other purposes, or owning property in, under or bordering upon same.
- 3.40 "Practice" shall mean the act of disposal of solid waste, as defined in 40 CFR §257.2(1979) and as may be amended.
- 3.41 "Putrescible Waste" shall mean solid waste which contains organic matter capable of being decomposed by microorganisms and of such a character and proportion as to be capable of attracting or providing food for disease vectors or birds.
- 3.42 "Recycling" shall mean the reuse of recovered resources in manufacturing, agriculture, power production or other processes.
- 3.43 "Refuse" (See "Solid Waste").
- 3.44 "Residue" shall mean any solid that remains after completion of solid waste processing including incineration products such as bottom ash, fly ash and grate siftings.
- 3.45 "Resource Recovery" shall mean the processing of solid waste in such a way as to produce materials or energy which may be used in manufacturing, agriculture and other processes.
- 3.46 "Sanitary Landfill" shall mean a land disposal site employing an engineered method of disposal of solid waste in a manner that minimizes environmental hazards including spreading the solid waste in thin layers, compacting the solid waste to the smallest practical volume and applying cover material at the end of each operating day or at such more frequent intervals as may be necessary.
- 3.47 "Segregated Solid Waste" shall mean useful material which has been separated from the waste stream at the generation source for purpose of recovering and recycling these materials.
- 3.48 "Septic Waste" shall mean any solid, liquid, or semi-solid waste removed from septic tanks or cesspools.



- 3.49 "Sewage Sludge" shall mean a semi-liquid substance consisting of settled sewage solids combined with water and dissolved materials in varying amount.
- 3.50 "Solid Waste" shall mean garbage, refuse and other discarded solid materials generated by residential, institutional, commercial, industrial and agricultural sources but does not include solids or dissolved material in domestic sewage or sewage sludge, nor does it include hazardous waste as defined in the Rhode Island Hazardous Waste Management Act, Chapter 23-19.1. For purposes of these rules solid waste shall also include non-hazardous liquid, semi-solid, and containerized gaseous wastes, subject to any special conditions contained in these rules.
- 3.51 "Solid Waste Management Facility" shall mean any plant, structure, equipment, real and personal property, except mobile equipment or incinerators with a capacity of less than one thousand (1,000) pounds per hour, operated for the purpose of processing, treating, or disposing of solid waste but not segregated.
- 3.52 "State" shall mean the State of Rhode Island.
- 3.53 "Surface Public Water Supply" shall refer to surface water that supplies piped water for human consumption by means of a system having at least fifteen (15) service connections or regularly serving at least twenty-five (25) individuals for at least sixty (60) days of the year.
- 3.54 "Surface Water" shall mean a body of water whose top surface is exposed to the atmosphere including rivers, ponds, lakes, etc
- 3.55 "Take" or "Taking" is defined in the Endangered Species Act, 16 U.S.C. §1533, as amended, and as may be amended.
- 3.56 "Toe" shall mean the bottom of the working face or side slope of a land disposal site where deposited solid waste is in contact with virgin ground or a previous lift.
- 3.57 "Transfer Station" shall mean a facility where collection vehicle transfer solid waste to haulage vehicles for transportation to final disposal sites or other solid waste management facilities.
- 3.58 "Vector" shall mean a carrier, usually an insect or rodent, that is capable of transmitting a pathogen from one organism to another.
- 3.59 "Washout" shall mean the carrying away of solid waste by waters of the base flood, as defined in 40 CFR 257.3-1, (1979) and as may be amended.
- 3.60 "Waste" shall mean discarded solid, semi-solid or liquid material.

- 3.61 "Waste Management" shall mean actions taken to effectuate the receipt, storage, transportation and processing for resource recovery and for the ultimate disposal of solid waste.
- 3.62 "Water Table" shall mean the upper water level of a body of groundwater.
- 3.63 "Working Face" shall mean that portion of a land disposal site where solid waste is discharged by collection and/or haulage vehicles and is spread and compacted prior to placement of cover material.

## PART II LICENSING

### 4.00 GENERAL REQUIREMENTS AND PROCEDURES

- 4.01 Plans and Specifications: (a) Initial Application: Application for licenses must include plans and specifications. All applicants regardless of facility type, must demonstrate their ability to comply with all General Operating Regulations set forth in Part III of these regulations, as well as the general requirements in this rule. Each applicant must also submit all plans and specifications required for the particular type of facility, as enumerated in Rules 6.00 through 8.00. (b) Renewal Application - Applications for renewal of licenses must include an updated operating plan as required in these rules. Engineering design plans need only be resubmitted for the approval of design changes.
- 4.02 Time of Application: The application for approval to construct, develop, establish, manage, own or maintain or a license to operate a solid waste management facility shall be submitted at least six (6) months prior to the planned opening date for an original license and three (3) months prior to expiration date for renewal of a license.
- 4.03 Documentation of Ownership: Each application shall be accompanied by:
- a) A list of the direct and indirect owners of the proposed solid waste management facility and the underlying real property, whether individual, partnership or corporation. If a corporation, the list shall include all officers, directors and other persons owning ten percent (10%) or more of the corporate stock.
  - b) In the event that an entity other than the owner of the underlying real property or of the facility is responsible for the operation of the solid waste management facility, such entity shall also meet the requirements of 4.03 (1) above.
- 4.04 Zoning: Granting of a license, license renewal or permission for an equipment addition shall in no way affect the applicant's

responsibility to meet all zoning and other local ordinances, nor the applicant's responsibility to obtain any local permits

- 4.05 General Plan Requirements: All required plans, with the exception of those specifically designated below as "Initial Investigation Plans," shall be stamped by a professional engineer or land surveyor registered with the State of Rhode Island. The plans should be scaled to fit on a standard 24x36 inch sheet wherever possible. Larger sheets can be used when the minimum scale requires. Applicants shall submit two copies of each plan, as well as a complete set of reproducible transparencies of the plans.
- 4.06 Need: Pursuant to 1956 R.I.G.L. Section 23-13.9-3.1(1979 Reenactment), as amended, each applicant shall demonstrate that the proposed landfill will serve a vital interest of Rhode Island and will be consistent with the strategies developed in the solid waste management plan adopted pursuant to 1956 R.I.G.L. Section 23-19-11, as amended. In addition, the applicant shall submit detailed material on the following:
- a) Amount of waste (stream);
  - b) What area will be serviced and how it has been serviced prior to the submission of the applicant;
  - c) Environmental effects as opposed to other alternatives for waste disposal or resource recovery;
  - d) Cost to the affected communities compared to alternatives for waste disposal or resource recovery; -
  - e) Other factors relevant to need as requested by the Director.
- 4.07 Equipment Addition: Plans as required by the Department must be submitted prior to the addition of any equipment to an existing facility.
- 4.08 Closure Procedures: a) General: Each applicant shall submit a closure plan with the application for license or renewal that shall contain information required by this rule. Each applicant shall also submit a closure plan required for the particular type of facility as enumerated in Rules 6.00 through 8.00, and Rule 9.00.
- b) Financial Responsibility: 1) The applicant and/or licensee shall file an estimate of the costs of closing the facility after its capacity is reached or operations have otherwise terminated, or when the Director may require it. The estimate shall take into account both the general information listed in this rule, as well as closure plans stipulated for the particular type of facility as enumerated in Rules 6.00 through 8.00 and Rule 9.00.
- 2) Bond Requirement: When an applicant notifies the Director of impending closure or at any other time deemed necessary by the Director to insure that these rules and regulations are complied with, the applicant shall post a bond unless the Director determines that such bond is not

necessary to insure proper closure, closures and/or post closure monitoring. The bond shall equal the estimate in Rule 4.03(b)(1) or it may exceed such estimate if the Director determines that such estimate is not adequate to fund closure procedures, post closure monitoring or compliance with these rules and regulations.

Whenever the Director finds that the operator is in violation of any closure requirements for the facility, or at any other time deemed necessary by the Director to insure that these rules and regulations are complied with, the Director shall have the right to use part or all of the bond to complete such closure or other requirements. Part or all of the bond shall be forfeited upon receipt of an order entered after a hearing by the Director stating that the operator is in violation of any closure or other requirements for the facility. Upon issuance of a certificate of closure, part of the bond shall be released and a portion of said bond may be kept by the Director as he determines is necessary to insure that the required monitoring procedures shall be completed.

c) Certificate of Closure: An operator must maintain and operate a solid waste management facility in accordance with these rules and regulations until a certificate of closure is issued by the Director.

d) Notification of Closure: The operator shall notify the Director of the impending closure of the facility at least ninety (90) days prior to such closure.

## 5.00 ISSUANCE, RENEWAL AND CONDITIONS OF LICENSES

5.01 General Issuance and Renewal of Licenses: No person shall construct, develop, establish, manage, own or maintain a solid waste management facility, without first having obtained approval issued by the licensing agency. No person shall operate a solid waste management facility without first having obtained a license to operate from the licensing agency. Such a license or license renewal shall be issued for a period of one year from the date of issuance, unless sooner suspended or revoked. Each such license or license renewal shall be issued only for the facility named in the application and shall not be transferable or assignable except with the written approval of the licensing agency. Each license or license renewal shall show compliance with Rule 4.00, as well as, rules relating to the particular type of facility. The licensing agency reserves the right to extend the expiration of such license for such time as shall be deemed necessary by the Director.

- 5.02 Posting of License: A license issued hereunder shall be the property of the state and loaned to such licensee and it shall be kept posted in a conspicuous place on the licensed facility and must be kept legible and protected from the weather.
- 5.03 Change of Ownership, Administration and/or Location:
- a) Prior to a change in ownership, or legal entity, or location, or discontinuance of services, the licensing agency shall be notified.
  - b) A license shall immediately become void and shall be returned to the licensing agency upon change in location of any facility or sale, lease, or change in ownership or membership of the legal entity conducting, maintaining or operating the facility.
- 5.04 Approval For New Areas and/or Services: The license shall apply only to the solid waste management facility operating at the time the license is issued. Additional areas or services shall be subject to the approval of the license agency and requirements of licensure.
- 5.05 Separate Licenses:
- a) Separate licenses shall be required for solid waste management facilities which are located in separate geographical areas even though they are under the same management.
  - b) A separate license may be issued to a distinct part of a facility which can be identified as a separate unit.
- 5.06 Fees: The license fee as well as any other necessary charges shall be determined by R.I.G.L. Section 23-18.9-9, and as may be amended. Licenses shall expire one year from the date of issue, unless sooner suspended or revoked. A license may be renewed annually at a fee as determined by Section 23-18.9-9 and as may be amended.
- 5.07 Denial, Suspension, Revocation of License:
- a) Procedure and Grounds: The agency, after notice and opportunity for hearing to the applicant or licensee, is authorized to deny, suspend or revoke a license where it finds there has been a failure to comply with regulations established by the licensing agency or where the applicant or licensee is not in compliance with any approved operating or engineering plans adopted pursuant to Part II or Part III of these regulations.
  - b) Corrective Action: Whenever the licensing agency determines that a licensed solid waste management facility is not being operated in conformance with all of the regulations

established by the licensing agency, or, that the licensed facility is not being operated in conformance with an approved operating or engineering plan adopted pursuant to Part II or Part III of these regulations, it may, in lieu of or in addition, or revocation of the license of that facility, order the licensee to take whatever corrective action necessary to secure compliance with the regulations established by the licensing agency, subject to the provisions of R.I.G.L. section 42-17.1-2(u).

5.08 Inspections:

- a) The licensing agency shall make or cause to be made such inspections, take such tests and specimens and to make such investigations as it deems necessary.
- b) The licensing agency or other designated authorized personnel shall conduct inspections and shall have the right to enter without prior notice to inspect any solid waste management facility for which an application has been received or for which a license has been issued. Any application shall constitute permission for or willingness to comply with inspections, tests and investigations by the Director or his agents.
- c) The licensing agency shall be afforded reasonable opportunity by the applicant or licensee to view the facility, examine records, obtain such required information as may be required for the inspection, testing and investigation. Refusal to permit reasonable inspections, tests and investigations shall constitute valid grounds for denial, revocation or suspension of a license.
- d) The inspector may leave a copy of the inspection report at the facility and such report shall constitute notice of any deficiencies. Such deficiencies as are noted in the inspection report may be used as the basis of a notice of violation and may be taken into account in any license renewal proceeding, in any request for new areas and/or services, and in any equipment addition request.

5.09 Inspection Reports and Correction of Deficiencies:

Every solid waste management facility shall be given prompt notice by the licensing agency of deficiencies reported as a result of an inspection, test or investigation. Such notification may be made by regular mail - postage prepaid from the Director to the person or facility inspected, tested or investigated. Notice may also be made by leaving a copy of the inspection report with an employee at the facility.

5.10 Penalties: Any person who constructs a solid waste management facility or installs equipment in such a facility without first obtaining approval of the plans and specifications for the same or any person who operates such a facility without obtaining a license to do so from the director shall be punished by a fine of not more than five hundred dollars (\$500.00) or by imprisonment for not more than thirty (30) days or both such fine and imprisonment, and every person shall be deemed guilty of a separate and distinct offense for each day during which such violation shall be repeated or continued, pursuant to R.I.G.L. 23-16

6.00 SANITARY LANDFILLS

General

6.01 Information: In addition to meeting the general requirements set forth in Rule 4.00 above, each applicant shall submit plans required by this rule.

6.02 Initial Investigation Plans: A copy of the latest geologic survey map available, with the site outlined, should be submitted to the Department prior to all other required information. This will allow initial investigations of the area relating to wetlands and aquifers before large investigation and development expenditures are made. A report of the investigation will be made to the applicant within 15 working days of submittal of the map.

6.03 Radius Plan: A radius plan including all the information listed below shall be submitted. The radius plan must be drawn to a minimum scale of one inch to two hundred feet (1" = 200') adjusted to fit on a standard 24x36 inch sheet and including all areas within a one-quarter (1/4) mile radius out from all property lines of the site. The required information includes:

- 1) Zoning of the areas as required by Rule 4.04 above.
- 2) All buildings and dwellings
- 3) All water supplies (wells, etc.)
- 4) All surface water courses and other wetlands
- 5) All roads
- 6) All boring locations
- 7) Legal boundaries of site
- 8) North arrow
- 9) Extent of 100 year flood plain (where applicable)

6.04 Site Plan: A site plan including all of the information listed below for all areas within the site shall be submitted. The site plan must be drawn to a minimum scale of one inch to one hundred feet (1" = 100') adjusted to fit on a standard 24x36 inch sheet. The required information includes:

1. Initial ground contours at five-foot intervals
2. Final Proposed contours at five-foot intervals
3. Boring locations
4. Proposed leachate collection and treatment facilities (if any)
5. Proposed gas controls (if any)
6. Buildings (if any)
7. Wells (if any)
8. Surface water courses (if any)
9. Roads (if any)
10. Cross section lines (See Rule 6.05)
11. Areas to be used for storing salvaged materials
12. Areas to be used for special waste as listed in Rule 10.06
13. Ground water monitoring wells
14. Legal boundaries of site
15. Power lines, pipe lines, rights of way and other utilities
16. Proposed fences
17. Weighing facilities (if any)
18. North Arrow
19. Location of borrow areas (if any)
20. Boundaries of areas to be filled as indicated in operating plan (See 6.08)

**6.05 Cross Sections:** Typical cross section plans including all the information listed below shall be submitted. A minimum of two cross sections will be required of right angled center lines passing through the approximate middle of the site. The cross section plans should be drawn using a minimum horizontal scale of one inch to one hundred feet (1" = 100') and a minimum vertical scale of one inch to ten feet (1"=10'). All required details should be drawn using equal vertical and horizontal scales. The required information includes:

1. Proposed lifts
2. Virgin ground
3. Maximum ground water table
4. Bedrock location
5. Side slopes
6. Details of surface drains and ditches
7. Final fill elevations and grades
8. Limits of excavations
9. Final cover elevations
10. Details on access road construction
11. Details of leachate collection systems (if any)
12. Details of gas venting facilities (if any)
13. Details of ground water monitoring wells

**6.06 Borings:** Borings will be required of all proposed areas to be filled. The minimum number of borings required will be as listed below:

<u>Proposed No. of Acres to be Filled</u>	<u>No. of Borings</u>
1-10	5
11-50	6
51-100	12
101-200	18
Over 200	24 (plus 1 for 10 acres over 20)



a) All borings should be driven to a minimum depth of twenty (20) feet below the proposed bottom level of refuse or to refusal. The following information contained on the boring logs should be submitted:

1. Depth of the maximum elevation of the ground water table (to be measured at a minimum of 24 hours after the boring is taken)
2. Soil description
3. Method of drilling
4. Blow counts
5. Date boring was taken

b) The boring should be located to give the best indications of subsurface conditions for the whole site that can be obtained considering the limited number of borings required. The ground-water table elevation determination shall be made when the water table is highest; this occurs usually during the months of January through April. (Specific dates may be determined on a yearly basis by the Director.) All boring holes must be maintained for future water table elevation determinations. If the Department feels it necessary, additional borings may be required.

6.07 Groundwater Plan: With the information obtained from the boring program required by 6.06 above, groundwater contours for the site shall be developed. A site plan which identifies groundwater contours at two (2) foot intervals shall be submitted to the Department prior to locating the required monitoring wells. Such site plan shall be reviewed annually. The Director may require the submission of an updated plan.

6.08 Operating Plan:

a) An operating plan shall be submitted including information on all of the areas listed below. The duration of the operating plan shall equal that of the license. The operating plan shall be reviewed by the applicant prior to license renewal and any changes to such plan shall be submitted to the Department for approval at that time.

b) The applicant must demonstrate an ability to comply with all General Operating standards and with the Sanitary Landfill standards listed in Rules 9.00 and 10.00 respectively. The following information shall be included in the plan:

1. Type of landfill method to be used (trench, area, etc.)
2. Proposed sequence of filling operation
3. Fire control and prevention provisions
4. Operating hours
5. All types of refuse to be accepted with corresponding approximate percentages of the total refuse
6. Personnel and duties
7. Projected use of completed site
8. Dust control program

9. Vector control program
10. Litter control program
11. Odor control program
12. Procedures to promote vegetative growth on completed area
13. Equipment to be on site during operating hours
14. Substitute equipment arrangements
15. Communications equipment available
16. Population and service area
17. Winter operations
18. Provisions for limited access
19. Weighing facilities (if any)
20. Estimated life of landfill
21. Aesthetic considerations
22. Salvaging operations
23. Handling procedures for special wastes as listed in Rule 10.06 (if any)
24. Leachate treatment operations (if any)
25. Surface drainage control methods

6.09 Cover Material: A sieve analysis, performed by a competent soils testing agency, will be required of the material to be used for cover. An estimation of the amount (in cubic yards) of cover material available and the source will also be required. If the cover material is to be purchased, a letter from the vendor stating the amounts which can be supplied must also be submitted.

6.10 Site Engineering: The following areas shall be marked with stakes at the site at the time of the engineering survey. The stakes must be visible and must be maintained at all times.

1. Area enclosed by legal boundaries
2. Areas to be filled as indicated in operating plan
3. Areas to be used for storing salvaged materials
4. Areas to be used for special waste as listed in Rule 10.06

6.11 Closure Plan: a) Pursuant to the requirements set forth in Rule 4.08 above, the operator shall submit a closure plan including information on the following:

- 1) Fences, gates, etc.
- 2) Groundwater and surface water monitoring devices and stakes
- 3) Final cover areas
- 4) Top soil and vegetation cover
- 5) Final grades
- 6) Legal boundaries

b) Accompanying the plan in Rule 6.11(a), the operator or applicator also submit specifications on the following:

- 1) Date of proposed closure
- 2) Methods of restricting access and preventing additional waste disposal
- 3) Methods of protecting ground and surface water and controlling air emissions
- 4) Date on which all solid waste disposal areas will be covered with two (2) feet of clean fill.
- 5) Date of covering disposal area with top soil and installation of impermeable covering, if any, and planting with vegetation.
- 6) Method of maintaining final grades and promoting surface runoff
- 7) Method of maintaining monitoring system after closure of facility.

6.12 Conservation Easement: Prior to and as a condition of granting a license for a solid waste management facility, the owner of the land on which the facility is to be located shall grant to the State of Rhode Island and Providence Plantations a perpetual conservation easement. The easement shall be recorded in the land evidence records of the city (cities) or town (towns) in which the land is located and shall describe the permitted facility and the activities to be conducted therein. Under the terms of the easement the director or his duly authorized agents shall have a perpetual right to enter upon such land at reasonable times for the purpose of inspecting the facility, or for the purpose of conducting tests where the facility is or was located. Such easement shall include a prohibition on any excavation of the facility site without prior written approval from the Director. The conservation easement shall also include the notation required by Rule 10.15 below.

## 7.00 INCINERATORS

7.01 General Information: The following requirements are related to the incinerator building site and the incinerator building itself. All general requirements set forth in Rule 4.00 must be submitted. All information relating to the residue disposal site required by Rule 6.00 must also be submitted.

7.02 Initial Investigation Plans: A copy of the latest geologic survey map available, with the incinerator building site and building marked and outlined, should be submitted to the Department prior to all other required information. This will allow initial investigations of the areas relating to wetlands and aquifers before large investigations and development expenditures are made. A report of the investigation will be made to the applicant within 15 working days of submittal of the map.

7.03 Radius Plans: A radius plan including all the information listed below shall be submitted. The radius plan must be drawn to a minimum scale of one inch to two hundred feet (1" = 200') adjusted to fit on a standard 24x36 inch sheet and including all areas within a one-quarter (1/4) mile radius out from all property lines of the site. The required information includes:

1. Zoning of the area as required by Rule 4.04 above
2. All buildings and dwellings
3. All water supplies (wells, etc.)
4. All surface water courses
5. All roads
6. Legal boundaries of site
7. North arrow

7.04 Site Plan: A site plan including all of the information listed below for all areas within the site shall be submitted. The site plan must be drawn to a minimum scale of one inch to one hundred feet (1" = 100') adjusted to fit on a standard 24x36 inch sheet. The required information includes:

1. Proposed leachate collection and treatment facilities (if any)
2. Buildings (if any)
3. Wells (if any)
4. Surface water courses (if any)
5. Roads (if any)
6. Areas to be used for storing salvaged materials
7. Legal boundaries of site
8. Power and pipe lines and other utilities
9. Proposed fences
10. Weighing facilities (if any)
11. North arrow
12. On site residue disposal areas (if any)
13. On site ash storage areas (if any)
14. Site drainage facilities
15. On site traffic patterns
16. Landscaping
17. Buffer zone

7.05 Construction and Engineering Plans: A complete set of construction and engineering plans and specifications relating to the incinerator building and all other associated buildings must be submitted to the Department.

7.06 Operating Plan:

a) An operating plan shall be submitted including information on all of the areas listed below. The duration of the operating plan shall equal that of the license. The operating plan shall be reviewed by the applicant prior to license renewal and any changes to such plan shall be submitted to the Department for

approval at that time.

b) The applicant must demonstrate an ability to comply with all General Operating standards and with the Incinerator Operating standards listed in Rules 9.00 and 11.00 respectively. The following information shall be included in the plan:

1. Operating hours
2. Operating and design capacities
3. Types of refuse to be accepted with corresponding approximate percentages of the total refuse
4. Personnel and duties
5. Dust control program
6. Odor control program
7. Litter control program
8. Substitute disposal arrangements
9. Communication equipment available
10. Population and service area
11. Provisions for limited access
12. Weighing facilities (if any)
13. Aesthetic considerations
14. Residue disposal arrangements
15. Fire control and prevention provisions
16. Pit and other refuse storage areas cleaning procedures
17. Routine overhaul and maintenance schedules
18. Residue and fly ash storage
19. Special waste handling procedures as listed in Rule 10.06
20. Bulky waste handling procedures
21. Water and waste water treatment and disposal
22. On site traffic control

7.07 Closure Plan: Pursuant to the requirements set forth in Rule 4.08 above, the operator shall submit a closure plan including information on the following:

- 1) Fences, gates, etc.
- 2) Legal boundaries
- 3) Measures taken to remove all remaining refuse and residue
- 4) Date of proposed closure
- 5) Methods of restricting access and preventing additional waste disposal
- 6) Methods of protecting ground and surface water and controlling air emissions.
- 7) Intended future use of the facility.

8.00 TRANSFER STATIONS, COLLECTION STATIONS AND RESOURCE RECOVERY FACILITIES

8.01 General Information: The following requirements are related to the facility and its site only. All information relating to other types of facilities used in the final disposal or intermediate processing of the refuse must be submitted as required in the rules relating to the particular types of operations. The applicant must also meet the general requirements of Rule 4.00 above.

- 3.02 Initial Investigation Plan: A copy of the latest geologic map available, with the building(s) and site(s) marked and outlined, should be submitted to the Department prior to all other required information. This will allow initial investigations of the area relating to wetlands and aquifers before large investigation and development expenditures are made. A report of the investigation will be made to the applicant within 15 working days of submittal of the map.
- 3.03 Radius Plan: A radius plan including all the information listed below shall be submitted. The radius plan must be drawn to a minimum scale of one inch to two hundred feet (1" = 200') adjusted to fit on a standard 24x36 inch sheet and including all areas within a one-quarter (1/4) mile radius out from all property lines of the site. The required information includes:
1. Zoning of the area as required in Rule 4.04 above.
  2. All buildings and dwellings
  3. All water supplies (wells, etc.)
  4. All surface water courses
  5. All roads
  6. Legal boundaries of site
  7. North arrow
- 3.04 Site Plan: A site plan including all of the information listed below for all areas within the site shall be submitted. The site plan must be drawn to a minimum scale of one inch to one hundred feet (1" = 100') adjusted to fit on a standard 24x36 inch sheet. The required information includes:
1. Proposed leachate collection and treatment facilities (if any)
  2. Buildings (if any)
  3. Wells (if any)
  4. Surface water courses (if any)
  5. Roads (if any)
  6. Areas to be used for storing salvaged materials
  7. Legal boundaries of site
  8. Power and pipe lines and utilities
  9. Proposed fences
  10. Weighing facilities (if any)
  11. North arrow
  12. Locations of buffer zones
  13. Landscaping
  14. On site traffic patterns
  15. Site drainage facilities
- 3.05 Construction and Engineering Plans: A complete set of construction and engineering plans and specifications relating to all buildings and equipment of the facility must be submitted to the Department.

9. Operating Plan:

a) An operating plan shall be submitted including information on all of the areas listed below. The duration of the operating plan shall equal that of the license. The operating plan shall be reviewed by the applicant prior to license renewal and any changes to such plan shall be submitted to the Department for approval at that time.

b) The applicant must demonstrate an ability to comply with all General Operating standards and with the Transfer Station, Collection Station and Resource Recovery Facility standards listed in Rules 9.00 and 12.00 respectively. The following information shall be included in the plan:

1. Operating hours
2. Operating and design capacities
3. Types of refuse to be accepted with corresponding approximate percentages of the total refuse
4. Personnel and duties
5. Dust control program
6. Odor control program
7. Litter control program
8. Substitute disposal and/or transfer arrangements
9. Communications equipment available
10. Population and service area
11. Provisions for limited access
12. Weighing facilities (if any)
13. Aesthetic considerations
14. Residue disposal arrangements (for resource recovery facilities)
15. Final disposal arrangements (for transfer & collection stations)
16. Vector control program
17. Fire control and prevention provisions
18. On site traffic patterns
19. Special waste handling procedures as listed in Rule 10.06
20. Bulky waste handling procedures
21. Routine house cleaning schedules

8. 7 Closure Plan: Pursuant to the requirements set forth in Rule 4.08 above, the operator shall submit a closure plan including information on the following:

- 1) Fences, gates, etc.
- 2) Legal boundaries
- 3) Measures taken to remove all remaining refuse and residue
- 4) Date of proposed closure
- 5) Methods of restricting access and preventing additional waste disposal
- 6) Methods of protecting ground and surface water and controlling air emissions
- 7) Intended future use of the facility.

## PART III OPERATING REGULATIONS

### 9.00 GENERAL OPERATING STANDARDS

9.01 Applicability: The following regulations contained in this rule shall apply to all solid waste management facilities. In addition, operating regulations for the particular type of facility must also be complied with as enumerated in Rules 10.00 through 12.00.

#### 9.02 Access:

a) Time: Access to the solid waste management facility shall be limited to the hours in which authorized operating personnel are on duty at the facility. Additional time shall be designated before and after normal operating hours to allow for "housekeeping chores", such as initial and intermediate cover application at sanitary landfills, wind-blown refuse control at all facilities, etc. There shall be no access to the facility during these times.

b) Physical Restraints: There shall be gates at all entrances to facilities which will prevent access to the facility except at such times as permitted under 9.02 (a) above. These gates should be locked when the site is unsupervised. Where the Department determines that the topography, vegetation or structures on or near the site adequately prevents unauthorized access, no further controls are required. Otherwise, fences may be required around the facility to limit unauthorized access.

9.03 Salvage: Only controlled removal and handling of waste for utilization shall be permitted at the site. Material to be salvaged should be unloaded at a salvage area separate from the working face. Salvaging of refuse shall be conducted in such a manner so as not to impede the proper operation of the facility and to insure the health and safety of all persons engaging in such activities.

#### 9.04 Water:

a) Surface Water Pollution: The facility or practice shall not cause pollution of the waters of the United States so as to violate the Water Pollution Act, 1956 R.I.G.L., Chapter 46-12, as amended, or, Section 402 of the Clean Water Act, 33 U.S.C. 1251 et seq. Nor shall the facility or practice cause a discharge of dredged material or fill in violation of Section 404 of the Clean Water Act, as amended.

b) Groundwater Pollution: A facility or practice shall not cause pollution of groundwater beyond the solid waste boundary or an approved alternate boundary. In addition, the facility shall comply with the requirements of the Clean Water Act, 33 U.S.C. 1251 et seq., and the regulations adopted pursuant to the Act, specifically 40 CFR §257.3-4, and as may be amended.



- 9.05 Vector Control: The facility shall not operate or continue to exist unless an on-site vector population is minimized by periodic application of cover material and by other appropriate techniques that will protect public health. Conditions shall be maintained that are sanitary and therefore unfavorable for the harboring, feeding and breeding of vectors. Control of insects and rodents where needed shall be effected by means of a program directed by a professional exterminator utilizing insecticides and/or rodenticides or other means approved by the Department.
- 9.06 Signs:
- a) There shall be erected at the entrance to the solid waste management facility a sign, clearly legible and visible, which shall contain the following:
    1. Name of facility and operator.
    2. Names of cities and towns served under contract (if any)
    3. Emergency phone number
    4. Restricted Materials (if applicable)
    5. Operating hours.
  - b) The Department may require directional signs within the facility, where necessary, to direct drivers to the appropriate unloading area, assist in traffic control and to regulate speed within the facility.
- 9.07 Communication: A suitable means of communication (telephone, two-way radio, etc.) shall be available at every solid waste management facility.
- 9.08 Air:
- a) Open Burning: Open burning of any type at a solid waste management facility shall be prohibited.
  - b) Air Standards: The facility or practice shall not violate State implementation plans approved or promulgated pursuant to: Chapter 23-23, 1956 R.I.G.L., as amended; the rules and regulations adopted to implement such Chapter; Section 110 of the Clean Air Act, 42 U.S.C. 7410(1977); and, as these may be amended.
  - c) Odors: Suitable measures shall be taken to minimize odors originating at all solid waste management facilities. This may be accomplished by immediately covering the odor producing materials with cover material at sanitary landfills or by immediate processing and/or disposal at other solid waste management facilities.
- 9.09 Inspections: All land, buildings, facilities and equipment used in the disposal, transfer, or processing of solid waste must be available for inspection by the Director at any reasonable time.

- 9.10 Endangered Species: No facility or practice shall cause or contribute to the taking of any endangered or threatened species pursuant to the Endangered Species Act, 16 U.S.C. 1531 et seq., and/or the regulations adopted to implement such Act, and as may be amended. The facility or practice shall not cause or contribute to the destruction or adverse modification of the critical habitat of endangered or threatened species.
- 9.11 Dust Control: The operator shall undertake suitable measures to control dust whenever necessary at every solid waste management facility, access roads to the facility and all other areas related to the facility's operation. This may be accomplished by spraying small amounts of water over the dust producing area and/or by the application of suitable chemicals or paving materials on access roads.
- 9.12 Control of Litter: Suitable measures shall be taken to minimize the scattering of refuse. The operator shall provide for routine maintenance and general cleanliness of all areas related to the facility's operation.
- 9.13 Safety Provisions:  
a) General: Solid waste management facilities shall be designed, operated and maintained in such a manner as to protect the health and safety of users of the facility and personnel associated with the operation of the facility, and persons in close proximity to the facility.  
b) Bird Hazard: A facility disposing of (or handling) putrescible wastes shall not pose a bird hazard to aircraft.
- 9.14 Operating and Engineering Plans: A facility shall be operated in conformity with its approved operating and engineering plans. Variances from such plans shall be permitted only after prior written approval from the Director.
- 9.15 Closure Procedure:  
a) Before a solid waste management facility may begin closure procedures, an application for closure must be filed and plans must be approved by the Department. The application shall contain information required by Rule 4.08 as well as closure plans prescribed for the particular type of facility. The applicant seeking permission to close shall demonstrate the feasibility of such closure plans, including compliance with all appropriate closure regulations.  
b) Once closure plans are approved by the Department, they shall be implemented by the applicant.

c) Requests for deviations from previously approved closure plans shall be in writing and written approval from the Department must be obtained prior to implementation.

d) After the closure plans have been fully implemented, the Department shall be notified so that an inspection may be made by Department personnel. A list of the deficiencies, if any, will be returned to the owner of the facility. After the Director determines that all deficiencies have been corrected and that closure is complete, a certificate of closure may be issued.

e) Revocation of certificate of closure: The Director may, at any time, revoke a certificate of closure, where the Director deems such action is necessary to protect the environment or the health and safety of any persons affected by the facility.

10.00 SANITARY LANDFILL OPERATING STANDARDS:

10.01 General: Sanitary landfill facilities shall meet all regulations set forth in this rule in addition to the General Operating Standards in Rule 9.00.

10.02 Working Face: The width of the working face shall be kept as narrow as is consistent with the proper operation of trucks and equipment in order that the area of waste material exposed during the operating day is minimal. No working face shall exceed one hundred fifty (150') feet in width when measured across the operating surface of the fill. Except where separate areas are designated on the engineering design for specific wastes, no more than one working face shall be in use at any one time.

10.03 Lift Height: No lift shall exceed twelve (12) feet in depth unless otherwise specified on the engineering design for the site.

10.04 Cover Material:

a) Initial Cover: All top surfaces and faces of the working lift shall be covered with six inches of cover material at least at the end of each working day.

b) Intermediate Cover: An additional six inch layer of cover material shall be applied over the six inch initial cover layer within one week after the disposal of refuse to all top surfaces and faces where an additional lift is not to commence within six (6) months.

c) Final Cover: A total thickness of twenty-four (24) inches of cover material shall be maintained on all surfaces and faces when the final planned elevation is reached, when no additional lift is to be added for one year, or when the landfill operation is terminated. Final cover shall include an application of soil of sufficient type and thickness to support vegetative growth, as required in subsection (g).

d) Cover Material Supply: A four (4) day supply of cover material shall be stored upon the landfill property at all times. This supply should be calculated on the basis of one part cover material to four parts of compacted waste (1,000 lbs/yd<sup>3</sup>).

e) Maintenance of Cover Material: All applications of cover material shall be maintained by the operator.

f) Permeability of Cover Materials: The Director may specify the permeability of cover material used on a site specific basis. The Director may also require the use of an impermeable cover to mitigate water pollution or for other purposes described in these rules.

g) Vegetation: The operator shall plant and maintain vegetative growth on all completed areas.

10.05 Water Pollution:

a. General: 1) No sanitary landfill shall be operated so as to cause or to be likely to cause pollution of the ground waters or surface waters of the State at or beyond the boundary of the sanitary landfill. For purposes of these rules, ground water monitoring well results taken pursuant to rule 10.11 shall be deemed to be results of ground water beyond the property line of the sanitary landfill in the absence of actual ground water results at or beyond such property line.

2) In determining whether said operation of a sanitary landfill is causing or is likely to cause pollution of the ground waters or the surface waters of the State, the Director shall consider the following factors:

i. Groundwater monitoring results from the facility show levels in excess of any one or more amounts for individual dissolved or liquid compounds as delineated in Appendix A.

ii. Groundwater monitoring results from the facility show contamination by one or more volatile organic or other compounds in excess of suggested-no-adverse-response levels (SNARLS) established by the United States Environmental Protection Agency.

iii. Topography, hydrology and geology of the area encompassing the sanitary landfill indicates a likelihood of contamination of a surface water body or ground water.

iv. Ground water leaving the property is likely to impact private or public drinking wells downgradient from the facility.

v. Ground water leaving the facility is likely to impact ground water used for commercial or industrial processes downgradient from the facility.

vi. Public water supply is not available for use downgradient from the facility.

vii. Ground water discharges into a body of surface water which is used or classified for private drinking water sources, commercial or industrial processes or recreational or other uses and the discharge from the facility is likely to negatively impact these uses.

3) In the event that the Director finds that the operation of a sanitary landfill is causing or is likely to cause pollution of the ground waters or the surface waters of the State, the Director may evaluate the operation of said sanitary landfill and require such measures as are necessary to abate, eliminate or avoid such pollution, including but not limited to the following:

- i. Ground water removal and treatment.
- ii. Contaminated ground water encapsulation.
- iii. Alternate sources of drinking water to impacted individuals.
- iv. In-ground treatment of contaminated ground water.
- v. The lowering of the ground water table in the area of the facility.
- vi. The limiting or exclusion of surface water percolating into refuse filled areas.
- vii. Obtaining waivers from individuals impacted from contaminated ground water.
- viii. Closure of the facility.

b. Surface Water: 1) No sanitary landfill shall be conducted within the watershed of any surface public water supply. Furthermore, no refuse shall be deposited within two hundred feet (200') of any surface water.

2) Sanitary landfills shall not be located on drainage areas of surface public water supplies.

c. Ground Water: 1) No sanitary landfill shall be conducted where solid waste may be in direct contact with ground waters of the State. A minimum of five (5) feet of soil is required between the highest water table level and the lowest level of deposited refuse. At the Director's discretion, a greater separation may be required.

2) Sanitary landfills shall not be located within 400' of an existing public water supply well. At the Director's discretion, a greater separation may be required.

d. Ground Water Reservoirs and Recharge Areas: 1) As provided in R.I.G.I Section 23-18.9-8.2, no person shall dispose of solid waste on or in the ground overlying ground water reservoirs or ground water recharge areas, provided that such ground water reservoirs or ground water recharge areas have been designated on the basis of hydrogeologic data, as an existing or planned public drinking water source by the municipality in which such reservoir or recharge area is located and that such municipality has enacted a municipal ordinance relating to ground water reservoirs or ground water recharge areas.

2) Where an existing solid waste management facility-landfill overlies such ground water reservoir or ground water recharge area designated by the municipality in accordance with subsection (a) hereof, the Director is authorized to order cessation of solid waste disposal operations and closure of said landfill under the following conditions:

i. The municipality has, after notice and public hearing, by resolution to the Director requested the Director to determine whether the continued operation of any solid waste management facility-landfill on or over any such reservoir or recharge area presents a hazard to the public drinking water source, and

ii. The Director after investigation, notice and hearing to said landfill, determines that such existing solid waste management facility-landfill does present a hazard to the public drinking water source.

10.06 Waste Handling:

a. Unloading of Waste: The unloading of solid waste shall be controlled and restricted to an area such that the material can easily be incorporated into the working face.

b. Spreading and Compacting of Waste: Solid waste shall be spread in layers of approximately two feet (2') in depth and compacted.

c. Litter: Wind-blown refuse shall be controlled by using fences or other means. The sanitary landfill shall be kept free of wind-blown refuse at times.

d. Handling of Special Waste:

1) Bulky Waste: Bulky waste shall be disposed of at the toe of the working face and incorporated into the working cell or stored in a separate area of the landfill approved by the Department for the purpose of salvaging these items. Any salvaged material may be stored with a cover for a maximum period approved by the Department.

2) Demolition Waste: Combustible demolition waste shall be covered daily along with other refuse or disposed of no closer than 500 feet to any refuse filled area.

3) Construction Waste: All construction waste shall be disposed of by covering along with daily refuse.

4) Brush: Any brush accepted at a sanitary landfill must be stored a minimum distance of 200 feet from the working face or buried. All brush not buried must be chipped within one week after arrival. Chipped brush may be stored indefinitely in this area.

5) Non-hazardous Liquid Waste:

i. Non-hazardous liquid waste shall be disposed of in a sanitary landfill only if special provisions are made for such disposal and are approved by the Department.

- ii. Any sanitary landfill accepting non-hazardous liquid waste for disposal on or in the ground shall install monitoring wells which are constructed and located in accordance with Department instructions. Samples shall be taken from each well and analyzed by a certified laboratory at least once every three months. Analyses shall be made for determinations as required by the Department. Should monitoring well analyses or any other means of detection indicate pollution of the waters of the State by the sanitary landfill, the acceptance of non-hazardous liquid waste shall be discontinued immediately. A system, acceptable to the Department, of interception, collection and treatment shall be implemented at once and shall continue until the possibility of pollution of the waters of the State by the sanitary landfill shall no longer exist. Prior to re-acceptance of the discontinued material, an engineering design which describes corrective measures to prevent recurrence of the pollution (and which is acceptable to the Department) must be submitted and the design implemented.
- iii. Any non-hazardous liquid waste accepted for disposal shall be covered immediately after it is dumped at any sanitary landfill. No uncovered pools of these materials will be allowed at any time.
- 6) Oil Spill Clean-up debris: Oil spill cleanup debris shall be disposed of only within special facilities constructed within the sanitary landfill. Such special facilities shall, as a minimum, be designed and constructed to meet the standards of a prototype facility described below in Appendix B of these rules and regulations.
- 7) Asbestos Disposal:
- i. Friable asbestos material shall not be disposed in a sanitary landfill unless the operator of the sanitary landfill has received specific approval from the director to accept such material. This approval shall be granted based on, but not necessarily limited to, the amount of refuse accepted at the landfill, the equipment and personnel available, and the need for asbestos disposal facilities. This approval may be revoked by the Director at any time.
- ii. Friable asbestos material shall not be accepted by a sanitary landfill approved for disposal of such material unless the friable asbestos material has been treated with water and labeled or processed into a non-friable form according to 40 CFR 61.20(j)(3)(i) or (ii), respectively, as is or as shall be amended.
- iii. Asbestos material accepted at a sanitary landfill shall be placed at the bottom of the working face and immediately covered with either a minimum of 2 feet of refuse or a minimum of 6 inches of clean fill.
- iv. There shall be no visible emissions of asbestos material from any sanitary landfill which has accepted asbestos material.

10.07 Equipment Requirements:

a. General Requirements: All equipment used shall meet the performance requirements necessary for operating the sanitary landfill in accordance with the operating requirements contained in these regulations.

b. Required Equipment for Refuse and Cover Material Handling: The table below will be used in determining the minimum number of pieces of landfilling equipment (front end loaders, bulldozers or landfill compactors) with operators that will be required on the site during all operating hours.

<u>Tons/Day Handled</u>	<u>Minimum Number of Pieces of Equipment</u>
0 - 100	1
100 - 200	2
200 - Over	3

Each piece of equipment must have a minimum basic weight without blade, bucket or other accessories of 17,000 pounds.

c. Equipment Breakdown: Arrangements in writing for emergency equipment shall be made to allow for operating equipment breakdown. Emergency equipment shall be on the site within twenty-four (24) hours of operating equipment breakdown.

10.08 Gas Control: Measures shall be taken to prevent the lateral movement of gases generated within the fill and to prevent the accumulation of these gases within confined structures on or adjacent to the fill area. Sanitary landfills using impermeable cover must adequately vent covered areas to prevent the accumulation of these gases.

10.09 Fire Protection: A facility shall not pose a hazard to the safety of persons or property from fires. In addition, the following requirements must be met:

a) All sanitary landfills shall arrange in writing for a nearby fire department to provide emergency service whenever called.

b) There shall be within 1,000 feet of the working face either an adequate supply of water under pressure or a stockpile of earth equivalent to four days cover material for use exclusively in fighting fires.

c) All landfill equipment (dozers, front end loaders and landfill compactors) shall be supplied with fire extinguishers.

10.10 Surface Drainage: The operator shall make provisions to have the sanitary landfill site, including the fill surface, graded and provided with a drainage system to minimize surface water runoff onto and into the fill, to prevent erosion of the fill, to drain off rain water falling on the fill and to prevent the collection of standing water. Measures will have to be taken to prevent sedimentation associated with surface drainage. The minimum top surface slopes shall be three percent. The maximum side slopes shall be no steeper than 3/1.



- 10.11 Monitoring Wells: (a) Sanitary landfills shall install monitoring wells at locations chosen by the Department for the purpose of monitoring groundwater conditions. The operator shall arrange for the sampling and analysis for constituents designated by the Director and on a schedule as determined by the Director. The operator shall notify the Director at least 48 hours prior to sampling groundwater monitoring wells. The Director may, in his discretion, sample such groundwater monitoring wells pursuant to rule 5.08.
- (b) New sanitary landfills shall conduct preliminary sampling and analysis for constituents designated by the Director prior to commencing operation of the facility.
- 10.12 Distance to Property Lines: No refuse shall be disposed of within two-hundred (200') feet of any property line. The Director may at his discretion require a greater distance.
- 10.13 Limited Access: Dumping of any solid waste at a sanitary landfill after one-half hour past sunset will not be allowed.
- 10.14 Flood Plain: No refuse shall be deposited such that the facility will restrict the flow of the 100 year base flood, reduce the temporary water storage capacity of the 100 year flood plain, or result in the wash out of solid waste.
- 10.15 Deed Restrictions: a) The operator shall insure that notations are properly made upon the deed for the disposal site land. The notation shall be amended as frequently as necessary to insure that all sites are properly documented. No license renewal shall be granted until the operator demonstrates that such notation has been made and/or updated. Such notation shall include:
- 1) type of waste disposed of at the site;
  - 2) the exact location of such waste;
  - 3) notice that excavation of previously filled areas shall not be conducted without prior written approval from the Department.
- b) No certificate of closure shall be granted to the land disposal facility until subsection (1) above has been met and the deed has been properly recorded.
- 10.16 Height Monitoring: An annual survey of the landfill height shall be taken by a properly licensed Rhode Island engineer or land surveyor. This survey shall be submitted to the Department within 30 days after the survey. Once the facility is within eighty (80) percent of its proposed final site elevation, the Department may require more frequent surveys as necessary to insure such elevation is not exceeded.
- 10.17 Excavation: The operator shall not excavate previously filled areas without prior written approval from the Director.

- 12.03 Waste Water and Leachate: All water used in processing the solid waste, cleaning the facility, as well as all leachate from the refuse collected in storage pits and transfer areas shall be disposed of in a manner that will not pollute any source of private or public water supply or any of the waters of the State or groundwaters.
- 12.04 Fire Protection: All transfer stations, collection stations, and resource recovery facilities shall have a water supply, under pressure, located on each floor suitable for fire fighting purposes, or other suitable means approved by the Director.
- 12.05 Structures: All transfer operations, refuse storage, collection stations and resource recovery operations shall be conducted within the confines of a protective structure. Non-putrescible salvaged material and bulk items may be stored in containers outside the station only with Department permission and only for a time approved by the Department.
- 12.06 Equipment Failure and Shutdown Provisions: All transfer stations, collection stations and resource recovery facilities shall have an alternate method of disposal, approved in writing by the Department, with another solid waste management facility for use in the event of equipment failure or forced shutdown.
- 12.07 Brush Handling: Any brush accepted at a transfer station, collection station or resource recovery facility must be chipped within one week after arrival or transferred for disposal within 48 hours of arrival. Chipped brush may be stored at the site indefinitely.

#### PART IV APPLICABILITY OF REGULATIONS

##### 13.00 EXISTING SOLID WASTE MANAGEMENT FACILITIES:

- 13.01 General Applicability: Existing solid waste management facilities shall comply with the provisions of these rules on and after the effective date, except that operators shall comply with rules 4.03, 4.04, 4.06, 4.08, 6.00, 7.00, and 8.00 in accordance with the applicable schedule delineated in rule 13.02 or 13.03.
- 13.02 Currently Licensed Facilities: Operators of all solid waste management facilities which are operating pursuant to a license issued for the current license year during which these rules take effect shall comply with these rules by the next license renewal date, provided however, that if there is less than six months time between the effective date of these rules and the expiration of said license, the operator shall have an additional ninety (90) days beyond said expiration date to comply with these rules.
- 13.03 Other Existing Facilities: Operators of solid waste management facilities which are operating pursuant to G.L. section 42-35-14(c), or by agreement with or orders of the licensing agency, or which have applied but have not yet received a license for the current license year during which these rules take effect shall have six months from the effective date of these rules to comply.

13.01 Existing Rules: a) Where operators of existing facilities are given time to comply with the provisions of these rules pursuant to SW 13.01, 13.02 and 13.03, such operators shall continue to operate the facility in compliance with the provisions of the Rules and Regulations for Operating Solid Waste Management Facilities, effective March 16, 1975, and any licenses, approvals, or orders issued prior to the effective date of these rules.

b) All notices and orders issued pursuant to the Rules and Regulations for Operating and Licensing Solid Waste Management Facilities, effective March 16, 1975 and December 11, 1975, respectively, shall remain in full force and effect until further action of the Director.

#### 14.00 NEW SOLID WASTE MANAGEMENT FACILITIES

Persons proposing new solid waste management facilities or expansion or modification of existing facilities shall comply with these rules.

### PART V VARIANCES:

#### 15.00 PROCEDURES FOR APPROVAL OR DENIAL OF VARIANCES

15.01 Application for Variance: The application for a license, license renewal or other approval under section 5.01 may include or be amended to include a request for a variance from the provisions of the Rules and Regulations for Solid Waste Management Facilities. Such request for a variance shall be on forms provided by the licensing agency and signed by the owner and a registered professional engineer.

15.02 Review by Licensing Agency: The Director, through the Division of Air and Hazardous Materials, shall evaluate each request for a variance. Such variance may be granted provided that the Director finds that such variance will not be contrary to the purposes and policy expressed in rules 1.02 and 1.03 and that alternative methods proposed by the operator fulfill the purposes of the rule from which a variance is requested. The Director may require a public hearing prior to approving any variance where a substantial question exists as to the environmental or public health impacts of such variance. Denial of such variance may be appealed in accordance with the procedures delineated below.

### PART VI APPEAL AND HEARING PROCEDURE:

#### 16.00 OPPORTUNITY FOR HEARING:

16.01 Denials: Any person whose application for a license, license renewal, other approval, or a variance, has been denied by the licensing agency, acting through the Division, may appeal to the Director for review of the decision on which the denial is based.

- 16.02 Violations: Any person who has been issued a notice of violation of any of the provisions of these rules, may request a hearing, to show compliance, subject to the provisions of R.I.G.L. 42-17.1-2(u).
- 16.03 Time of filing: All requests for a hearing shall be made in writing within ten (10) days of receipt of the notice of denial or violation or other action and shall be addressed to the Division of Air and Hazardous Materials at the address designated in rule 2.03.
- 16.04 Hearings and Administrative Procedures: Pursuant to the authority granted to the Department in Chapter 42-17.1 (1977 Reenactment) and Chapter 42-35 (1977 Reenactment) the hearings and administrative procedures shall conform to the "Administrative Rules of Practice and Procedure for the Department of Environmental Management" (effective November 11, 1980.)

#### PART VII EFFECTIVE DATES

- 17.00 Effective Dates: These rules shall take effect on the date specified in the attached certification of promulgation by the Director of Environmental Management and the Environmental Standards Board.

## Appendix A

Inorganic Chemicals

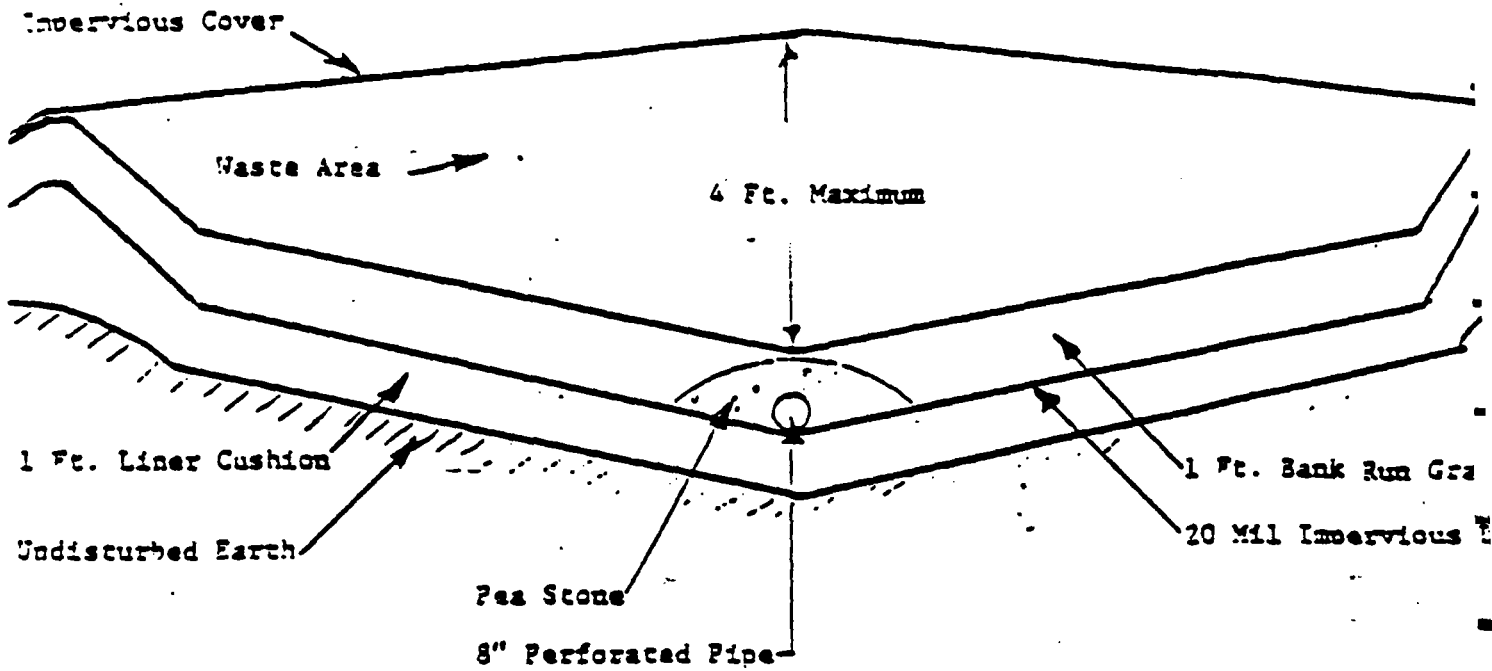
<u>Contaminant</u>	<u>Milligrams Per Liter</u>
Arsenic (As)	0.05
Barium (Ba)	1.
Cadmium (Cd)	0.010
Chromium (Cr)	0.05
Fluoride (F)	2.0
Lead (Pb)	0.05
Mercury (Hg)	0.002
Nitrate (as N)	10.
Selenium (Se)	0.01
Silver (Ag)	0.05

Organic Chemicals

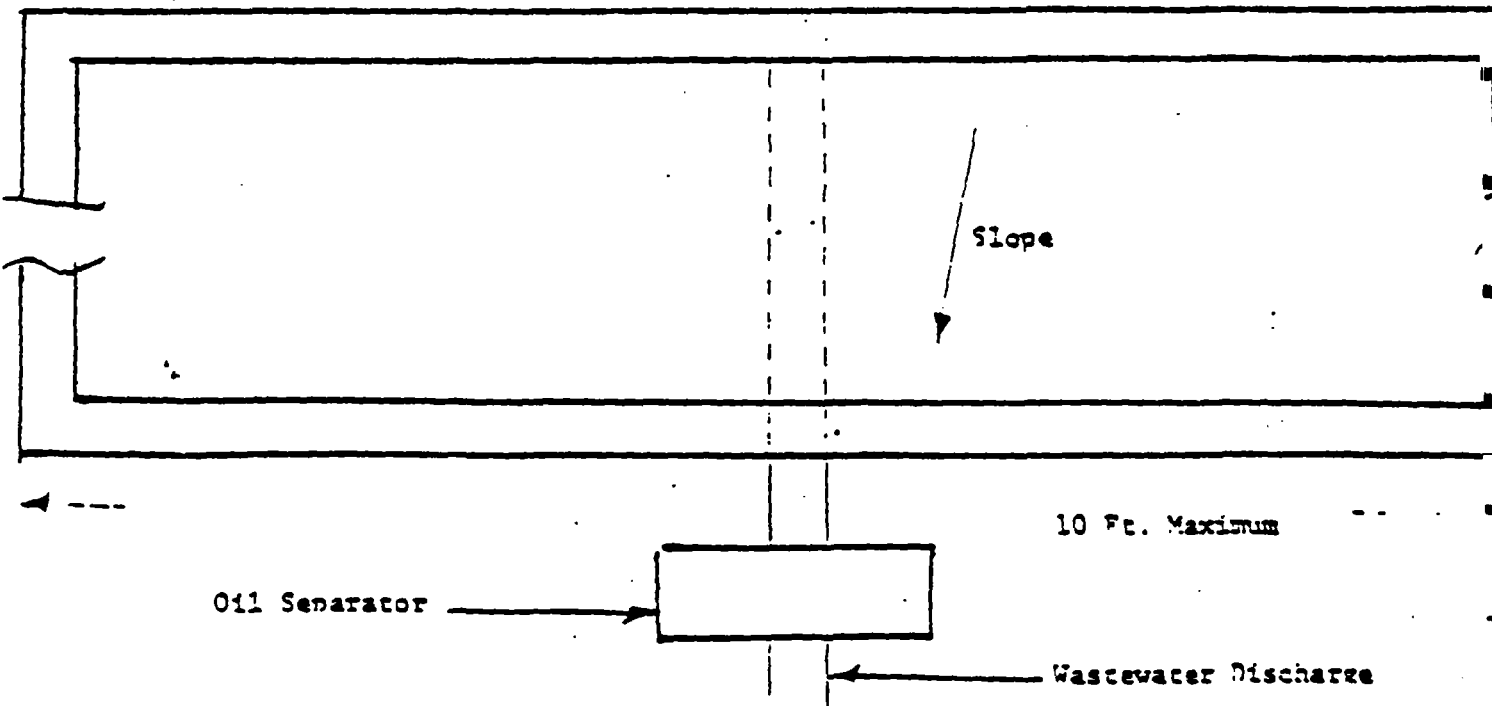
Total Trihalomethane	100 ppb
1,1,1 Trichloroethane	1,000 ppb
Tetrachloroethylene	20 ppb
Trichloroethylene	75 ppb

Appendix 3

Oil Spill Protocol Type Facility



Cross Section



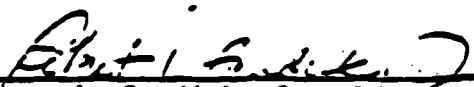
Plan View

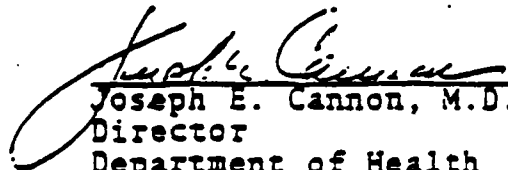
CERTIFICATION

The foregoing rules and regulations are hereby adopted and filed with the Secretary of State this \_\_\_\_\_ day of \_\_\_\_\_, 1982, to be effective on and after the 1st day of December, 1982, in accordance with the provisions of the General Laws of Rhode Island, 1956 (as amended), sections 42-35-3, 42-35-4, 42-17.1-2 and chapters 23-18.9, 23-19, and 42-17.3.

ATTEST A TRUE COPY

ENVIRONMENTAL STANDARDS BOARD  
and  
DIRECTOR, DEPARTMENT OF  
ENVIRONMENTAL MANAGEMENT

  
Robert L. Bendick, Jr., Director  
Department of Environmental  
Management

  
Joseph E. Cannon, M.D.  
Director  
Department of Health

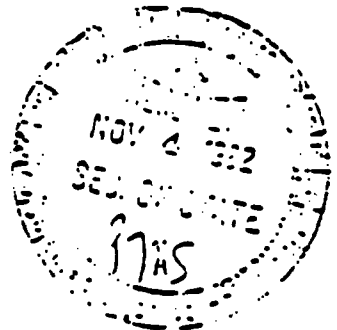
  
Don H. Rohrer  
Director of Administration

Date of  
Notice of Hearing on  
Proposed Regulations:

April 6, 1982

Date of  
Public Hearing:

April 29, 1982



*No specific effect on...*

STATE OF RHODE ISLAND  
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
RULES AND REGULATIONS  
GOVERNING THE ENFORCEMENT  
OF THE FRESH WATER  
WETLANDS ACT  
June 15, 1981



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(1)

STATE OF RHODE ISLAND  
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
RULES AND REGULATIONS  
GOVERNING THE ENFORCEMENT  
OF THE FRESH WATER  
WETLANDS ACT  
MARCH, 1981

1.00 ADMINISTRATIVE FINDINGS AND POLICY

1.01 Under the authority of Section 2-1-20.1 of the General Laws of 1956, as amended the following Rules and Regulations are being promulgated to administer Sections 2-1-18 through 2-1-24, inclusive, of the General Laws of 1956, as amended, and supersede all previous Rules and Regulations adopted therefor.

1.02 The declarations of intent and public policy enumerated by the General Assembly in Sections 2-1-18 and 2-1-19 are hereby adopted as the administrative findings and policy upon which these regulations are based.

1.03 In addition the following administrative findings are made as further basis for these regulations:

- (a) Any reduction in flood plains and water retention capacity of a Fresh Water Wetland increases the risk of loss of life and property in the drainage basin.
- (b) Alteration of wetlands may reduce groundwater levels, which may, in turn, adversely affect groundwater supplies, thus presenting a threat to the public health.
- (c) Alteration of wetlands may result in the loss of the most fundamental and valuable of all wildlife habitats, open space and recreational areas.
- (d) Alteration of wetlands frequently results in non-reversible damage to the resources, which are vital to the balance of the environment. Such damage may be permanently detrimental to the health and welfare of the public.

- (e) Alterations within wetland areas, or within the drainage basin surrounding wetland areas, often reduce the ability of wetlands to prevent flooding.
- (f) Alteration of wetlands often adversely affects soil stability and results in erosion.
- (g) Alteration of wetlands may adversely affect water quality and diminish the uses of water bodies through sedimentation and other causes.

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2.00 DEFINITIONS

2.01 Act - The term "Act" shall mean Sections 2-1-28 through 2-1-24 inclusive of the General Laws of 1956, as amended.

2.02 Alter, Alteration - The terms "Alter" (verb) and "Alteration" (noun) shall include, but not be limited to, excavation; drain installation; filling; drainage discharge; directing effluents or surface water flows into or out of; grading; diking; damming; diverting; adding to or taking from; or otherwise changing the character of any fresh water wetland.

(a) Activities conducted outside of wetland areas shall be considered alterations of the wetland if such activities directly affect the ability of the wetland to moderate flooding, provide wildlife habitat, recharge the groundwater supply, or provide recreation. Such activities shall include:

- (1) Interception of ground or surface water (e.g., by surface or subsurface drain installation) feeding a fresh water wetland.
- (2) Conducting earth work which causes sediments to enter a fresh water wetland.

(b) Activities which will not under normal circumstances be considered alterations of the wetland shall include:

- (1) Selective tree cutting where no disruption of soil stability or existing topography is allowed.
- (2) Continuing agricultural practices (e.g., planting, cultivating, or grazing existing fields).
- (3) Brush and footpath cutting where no physical changes in topography are allowed.
- (4) Performing maintenance to existing structures where no physical changes to the structure are proposed.
- (5) Manual removal of debris or accumulated matter foreign to the wetland

- 2.03 Applicant - The term "Applicant," as used herein, shall mean the person, firm, partnership, corporation or government agency applying for approval to alter a fresh water wetland or seeking determination concerning the applicability of the Act, and shall be limited to the owner of the subject property (including a leaseholder or purchaser under written purchase or sales agreement), or the agent of the owner or interest-holder with written authorization to submit an application.
- 2.04 Areas Subject to Flooding - The term "Areas Subject to Flooding" shall include depressions flooded by "Areas Subject to Storm Flowage" (as defined in Section 2.05) which collect, hold and/or meter our storm and flood waters; or special flood hazard areas delineated by the Department of Housing and Urban Development Federal Insurance Administration Flood Hazard Boundary Map currently administered by the Federal Emergency Management Agency (FEMA) for the cities and towns of the state, other than those areas defined as "Floodplain" in Section 2.14 of these Regulations, unless a more accurate site-specific study has been conducted by a registered professional engineer and approved by the Director (see Section 7.02).
- 2.05 Areas Subject to Storm flowage - The term "Areas Subject to Storm Flowage" shall be defined as those channel areas, intermittent streams, and water courses other than that area defined as "River" in Section 2-1-20 of the Act which carry storm, surface, groundwater discharge or drainage waters, out of, into, and/or connect fresh water wetlands as defined by Section 2-1-20 of the Act and/or coastal wetlands. Such channels shall be recognized by the evidence of scouring, or a marked change in vegetative density and/or composition. (see Section 7.02).
- 2.06 Dam - The term "Dam" (verb), as used in Section 2-1-21 of the Act, shall mean to permanently impound surface water to a depth of three (3) feet or more above the original river bed; or (noun) any structure capable of accomplishing the above, or any structure specifically designed to permanently impound storm flows (flood control dam). (See, also, Section 6.03).

- 2.07 Department - The term "Department" or DEM shall mean the Department of Environmental Management.
- 2.08 Detention Basin - The term "Detention Basin" shall mean an impoundment or excavated facility which stores peak runoff and releases the runoff at a controlled rate.
- 2.09 Director - The term "Director" shall mean the Director of the Department or his authorized designee.
- 2.10 Disapprove - The term "To Disapprove," as used in Section 2-1-21(a) of the Act, shall mean to notify the Director, in writing, of an official decision of the appropriate city or town council denying approval of an application to alter a fresh water wetland.
- 2.11 Drain - The term "Drain," as used in Section 2-1-21 of the Act, shall mean to artificially lower the normal surface water and/or groundwater elevation.
- 2.12 Edge - The term "Edge" of a wetland, as used in Section 2-1-20 of the Act, shall mean the limit of the extent of the appropriate vegetational community or physical feature which determines the existence of a given wetland, as defined in the Act.
- 2.13 Fill - The term "Fill" (verb), as used in Section 2-1-21 of the Act, shall mean to place dirt, stones, gravel, sand, tree stumps, solid wastes, garbage or other foreign material on or in the wetland, or (noun) the material placed in the act of filling.
- 2.14 Flood Plain - the term "Flood Plain," as used herein shall mean that land area adjacent to a river which is, on the average, likely to be covered with flood water resulting from a 100-year frequency (1% probability) storm, as further defined in Section 2-1-20 of the Act, and shall be that land so designated as flood plain on U.S. Department of Housing and Urban Development Federal Insurance Administration Flood Hazard Boundary Map, currently administered by FEMA, unless a more accurate study of the subject flood plain has been adopted by regulation by the Director, or unless a more accurate site-specific study has been conducted by a registered

professional engineer in accordance with Section 7.03 (see Appendix A entitled "Flood Plain Studies").

2.15 Growing Season - The term "Growing Season" shall mean the period from April 1 to October 31 of any calendar year.

2.16 Insignificant Alteration - The term "Insignificant Alteration," as used herein, shall be defined as an alteration (see 2.02) where no detrimental modification of the basic natural capabilities of a fresh water wetland will result. In assessing the impact of a proposed alteration of a wetland, the Director shall consider the effect of the proposed alteration on the capability of the wetland to:

- (a) Moderate the velocity and volume of flood flow through storage and/or absorption;
- (b) Recharge the groundwater supply;
- (c) Provide wildlife habitat;
- (d) Provide a recreational environment.

2.17 Map Survey - The term "Map Survey" shall mean a set of maps providing an approximate delineation of the types, locations, and boundaries of wetland areas, but not necessarily indicating all wetland areas. This map survey will be revised from time to time as additional data warrants.

2.18 Objection of a Substantive Nature - The phrase "An Objection of a Substantive Nature," as used in Section 2-1-22 of the Act, shall mean an objection which alleges (on the bases of representation of fact) that the proposed alteration may be of detriment to the values of a wetland, including among others, the abilities of a wetland to:

- (1) Moderate the velocity and volume of flood flows through storage and/or absorption;
- (2) Recharge the ground water supply;
- (3) Provide wildlife habitat;
- (4) Provide a recreational environment.



The determination of whether an objection to an application for permission to alter wetlands conforms to this definition shall be made under the procedure outlined in Section 5.05 of these Rules Regulations.

2.19 Plant or Vegetational Community - The term "Plant Community" and/or Vegetational Community" shall mean an association of plants that together comprise more than 50% of the plant cover present in a given area.

2.20 Project Area - The term "Project Area," as used in Section 2-1-22 of the Act, shall mean that portion of subject wetland proposed for alteration and located within the applicant's property boundaries.

2.21 Sediment Basin - The term "Sediment Basin," shall mean an impoundment or excavated facility constructed in or across a waterway or runoff course, and designed to allow sediments to precipitate.

2.22 Significant Alteration - The term "Significant Alteration," as used in Section 2-1-22 of the Act, shall be defined as an alteration where detrimental modification of the basic natural capabilities of a fresh water wetland will result. In assessing the impact of a proposed alteration on a wetland, the Director shall consider the effect of the proposed alteration on the capability of the wetland to:

- (a) Moderate the velocity and volume of flood flows through storage and/or absorption;
- (b) Recharge the ground water supply;
- (c) Provide wildlife habitat;
- (d) Provide a recreational environment.

2.23 Width During Normal Flow - The phrase "Width During Normal Flow," as used in Section 2-1-20 of the Act, shall mean the distance between the edges of the normal channel of the river; such normal channel being indicated by evidence of scouring and/or a marked reduction in vegetative density.

2.24 Wildlife Habitats - The term "Wildlife Habitats" shall mean those fresh water wetlands that provide breeding, nursery, resting, or feeding grounds for birds,

mammals, fish, reptiles, amphibians, invertebrates, or the individual plants and animals which provide food, cover, breeding sites or other life support systems for these forms of animal life.

3.00 FRESH WATER WETLANDS SECTION

3.01 Description of Operation -

A unit of the Department of Environmental Management, Division of Water Resources, designated as the "Fresh Water Wetlands Section", shall perform all duties related to the administration of the Act. Such duties will include the receipt, analysis, investigation and processing of wetland-related complaints, requests for preliminary determination, and applications for approval to alter fresh water wetlands.

3.02 Delegation of Authority

- (a) Natural Resources Specialists within the Fresh Water Wetlands Section are hereby specifically delegated authority to issue preliminary determinations under Section 2-1-22 of the Act and these regulations.
- (b) Natural Resources Specialists, Engineers of the Fresh Water Wetlands Section, Supervisor of the Division of Water Resources, and Officers of the Division of Enforcement are hereby specifically delegated authority to issue cease and desist orders and restoration orders pursuant to Sections 2-1-23 and 24 of the Act.
- (c) Natural Resources Specialists, Engineers of the Fresh Water Wetlands Section, and Supervisor of the Division of Water Resources are hereby authorized to file a complaint on behalf of the Director with the local city/town or state police where such staff person witnesses a violation of an order of the Director, for an offense punishable pursuant to Section 2-1-24 of the Act.

3.03 Information -

Information, copies of Wetland Survey Maps, forms or other materials related to the Fresh Water Wetlands Act shall be available upon request by telephone (277-682) or at:

Fresh Water Wetlands Section  
Department of Environmental Management  
83 Park Street  
Providence, Rhode Island 02908

Hours: 8:30 a.m. to 4:00 p.m. daily  
except Saturdays, Sundays, and Holidays.

3.04 Complaints -

All complaints of possible wetlands violations received by the Fresh Water Wetlands Section are investigated. If such a complaint reveals an actual wetlands violation, the investigative report will be filed and notice of the applicability of the Act will be given to the owner of the land upon which the violation has occurred.

3.05 Application Processing -

As closely as is practicable, all applications for preliminary determination and for permission to alter wetland will be processed in order received complete with all required enclosures. Applications will be considered out of sequence only when authorized by the Director or his designee.

Applications subject to a prior Notice of Violation will not be processed unless a consent agreement is reached with this Department to resolve said violation. (See Section 11.03(h)).

4.00 **PRELIMINARY DETERMINATIONS**

4.01 **Request for Preliminary Determination -**

- (a) Forms for making requests for preliminary determination of the applicability of the Act to a proposed project are available in accordance with Section 2-1-22 of the Act. Interested parties may obtain the appropriate forms from the Wetlands Section by telephone, mail or personal requests (see Section 3.02); such forms are hereby made a part of the rules and regulations.
- (b) Notification of the Director's decision on the applicability of the Act will be forwarded, at least once each month, to the appropriate city or town clerks for distribution to local officials, as specified in Section 2-1-22 of the Act.

4.02 **Factors Considered in Preliminary Determination -**

The Director shall, upon review of adequate plans and/or proposed work and inspection of the subject property, determine,

- (a) Whether a fresh water wetland is present on/or adjacent to the subject property, in accordance with the standards enumerated in the Act and these rules and regulations, and
- (b) If a wetland is present on/or adjacent to the subject property, whether the proposed alteration is a significant alteration of the subject wetland.

4.03 **Insignificant Alterations -**

- (a) Applications for preliminary determination involving fresh water wetlands which in the opinion of the Director, will result in an insignificant alteration to the subject wetland, will be approved, subject to such conditions as the Director may require to protect the subject wetland against significant alteration.
- (b) The following are the types of alterations which, under normal circumstances shall be considered insignificant by the Director. Note that other types of alterations not listed here may also be considered insignificant. However, certain circumstances peculiar to the subject wetland may make the alteration

significant and require a formal application.

- (1) Dug-out ponds of 1/2 acre or less in mineral swamps or in areas subject to flooding and storm flowage if, and only if, spoils are removed from the wetland, including adjacent upland area prescribed in Section 2-1-20 of the Act;
- (2) Cut and fill proposals involving only flood plain/riverbank wetlands, if net zero displacement of flood plain will result, i.e., if a project involves the filling of flood plain, such loss in flood plain holding capacity must be balanced elsewhere within the limits of the project by a corresponding increase in floodholding capacity. Appropriate engineering is required (see Section 7.03)
- (3) Surface drainage discharges into wetland areas where no known local flooding problems exist. If local flooding problems are known to exist, the information required in Section 7.02 of these rules and regulations must be supplied by the applicant and such a proposal will be approved only if appropriate mitigating measures are provided by the applicant;
- (4) Crossing of areas subject to storm flowage and rivers less than 10 feet wide where culvert is 50 feet or less in length, no wetland vegetation is to be destroyed or can be reestablished and no relocation of stream is proposed. Information required in Section 7.02 must accompany application and show no negative impact;
- (5) Corrective measures ordered by DEM (e.g., sediment basins);
- (6) Miscellaneous alterations where no wetland values are affected (See Section 1.03);
- (7) Excavation/Channelization of areas subject to storm flowage where appropriate engineering is submitted (see Section 7.02 and 7.04).

4.04 Emergency Alterations

(a) Upon oral application to the Director, approval for emergency alterations may be given in the form of a preliminary determination under the following circumstances:

- (1) Such application must be made by the appropriate official (e.g., city engineer) of a federal, state, city, or town agency.
- (2) No significant biological alteration of wetland is involved.
- (3) No displacement of flood plain involved.
- (4) Application and complete engineering as-built plans must be submitted if replacement varies from the original.

As-built plans must be submitted within 30 days of request for emergency approval. Such plans must show previous conditions and be accompanied information required in section 7.02. If plans/information show negative impact, appropriate modification will be required. Failure to accomplish required modifications within a reasonable time period (set by the Department) will be considered a violation of the terms of approval.

(b) Such oral application to the Director shall specify why the project is necessary for the protection of the public health and safety.

4.05 Replacement of Drainage Structures by Federal, State, City or Town Agencies

(a) Federal, State, City, or Town agencies may replace existing highway and bridge drainage pipes and culverts of the same size, flow capacity and at same invert elevation.

(b) An application for a preliminary determination must be submitted if any of the following circumstances is involved in the proposed work:

- (1) Biological alteration of a wetland will result.
- (2) Displacement of the flood plain will result.
- (3) The drainage structure to be installed varies in size or flow characteristics from the drainage structure to be replaced.

(4) Alteration of a river.

(c) Appropriate temporary (construction phase) and permanent erosion and sedimentation controls must be utilized. (See Section 7.04)



**5.00 FORMAL APPLICATIONS**

**5.01 General-**

Proposals which will result in significant alterations of fresh water wetlands are subject to the formal application procedures delineated in Section 2-1-22 of the Act.

**5.02 Applications for Approval to Alter a Fresh Water Wetland -**

Forms for making application for permission to alter a fresh water wetland are available, in accordance with Section 2-1-22 of the act. Interested parties may obtain these forms from the Wetlands Section by telephone, mail or personal request (see Section 3.02). The enclosures required to complete an application are specified on the application forms. Such forms are hereby made part of these rules and regulations.

**5.03 Policy for Denial of Approval -**

- (a) In the public interest, the Director is charged by the Act with "The protection of ... Fresh Water Wetlands from random, unnecessary, and/or undesirable ... disturbance or destruction".
- (b) Approval of a proposed alteration to a wetland will be denied by the Director, if, in his opinion, such alteration is inconsistent with the public interest, an public policy as stated in Sections 2-1-18 and 2-1-19 of the Act and section 1.00 of these regulations.
- (c) Approval of a proposed alteration to a wetland will be denied by the Director, if, in his opinion, such alteration will cause random, unnecessary and/or undesirable destruction of fresh water wetlands including, but not limited to:
  - (1) Reduction of the volume of a flood plain where such reduction could increase the probability of loss of life and/or property.
  - (2) Reduction of the ability of a wetland to moderate the damaging effects of flood flows.

- (3) Reduction of the ability of a wetland to recharge any ground water aquifer, with particular emphasis on those aquifers which may be, from time to time, designated by the appropriate municipal authority as an existing or potential drinking water supply pursuant to Section 23-19.1-10.1 of the R.I. General Laws.
- (4) Reduction in the use assigned to that class of water quality as defined in Rhode Island Water Quality Regulations for Water Pollution Control, RI DEM, 1979.
- (5) Reduction of the ability of any wetland tributary to a public water supply to remove pollutants from surface water.
- (6) Degradation of the natural character of any "unique" wetland (see Section 7.06).
- (7) Reduction of the value of any "valuable" wetland (see Section 7.06)

#### 5.04 Appeal of Director's Decision -

In cases of full or partial denial where no public hearing was required under the provisions of Section 2-1-22 of the Act, the applicant, and those objecting during the notice period of the pending application will be sent the decision by first class mail. The decision will state explicitly the reasons for denial. The applicant may within 10 days of the receipt of the decision, request in writing a public hearing before a designee of the Director of DEM to appeal the decision. Such a hearing will be conducted under the procedures set forth in Section 2-1-22 of the Act and Section 11.02 herein.

#### 5.05 Objections to Applications for Permission to Alter Wetlands -

- (a) Objections filed with the Department under the provisions of Section 2-1-22 of the Act will be considered valid only if they are in writing, signed, and received during the 45-day waiting period defined by the "Notice of Application". When the last day of the 45-day period falls on a weekend or holiday, the deadline will be extended through the next working day. Five days

after the deadline will be allowed for delivery of mail, but an objection received during this 5-day period will be considered valid only if postmarked within the 45-day waiting period.

- (b) The determination of whether an objection is of a substantive nature shall be made by a panel (in the form of a circulated signature sheet(s) consisting of:
1. Supervisor of Wetlands Section
  2. Senior engineer of Wetlands Section
  3. Department legal counsel
  4. Supervisor, Division of Water Resources

Panel Members will consider an objection substantive if it is based upon the intent and purpose of the Act as described in Section 1 herein and is not demonstrably false (either by staff evaluation of data already submitted by applicant or by staff reports).

A determination by one member of the panel that an objection is substantive will, under the provisions of Section 2-1-22 of the Act, necessitate a public hearing or alternative resolution of the objection (see (e) below).

- (c) If an objection is determined to be substantive, the applicant will be so notified. The applicant may then withdraw his/her application or pursue an alternative resolution of the objection (see (e) ). If he/she wishes to proceed, he/she must authorize the scheduling of the public hearing in writing and must also post a \$300 deposit to ensure payment of hearing expenses. The Department will then schedule the public hearing under the provisions of Section 2-1-22 of the Act. (See Section 11.02)

If an objection is ruled invalid or not substantive, the objector will be sent copy of the Department's decision, in which the objection and the reasons for such a ruling are noted.

- (d) An objector may withdraw his/her objection, or the appropriate Town/City Council its disapproval at any time prior to a final decision on the application.

(e) Prior to Public Hearing, an applicant will be allowed to refute objections under the following conditions:

1. The objection is based on a simple inadequacy of data submitted by the applicant prior to the 45-day waiting period for objections.
2. The applicant revises his/her proposal in such a way as to mitigate the negative impacts upon which the objection was based. Such a revision, however, must represent, in all respects, a less severe alteration of the wetland than that originally proposed.
3. In either case "1" or "2", the objector(s) will be notified of the corrections/revisions by first class mail and will be allowed 20 days to renew his/her objection. If the objector elects to renew his/her objection, such renewed objection will be evaluated as described in Section 5.05 (b).

## 6.00 REQUIRED SUBMISSIONS FOR FORMAL APPLICATIONS

### 6.01 General -

Design, drawings, computations and other technical materials submitted with applications must follow the appropriate generally accepted engineering techniques and methods. Technical submissions must be prepared by a Registered Professional Engineer in accordance with Section 2-1-22 of the Act. Such materials must clearly indicate the impact of the proposed project on the subject wetland and any mitigation measures to be utilized to reduce the impact and must be accompanied by a narrative description of proposed alteration of the wetland.

Applications will be processed only when all required submissions are received. Applications will not be processed if any unresolved violations exist on the subject property (or on property under the same ownership), unless such application includes resolution of all violations on subject property.

Applications will not be processed if any previous hearing bills have not been paid in full.

### 6.02 Site Plans -

Site plans for all proposed projects must show the existing site conditions including topography and major cultural features, as well as proposed contours, construction, drainage structures and all other work which may affect the subject wetland. In cases when alterations of wetlands have occurred after the effective date of the Act (July 16, 1971) or of its Amendment (May 9, 1974), without approval of the Director, the "existing site conditions" shown must reflect, as nearly as possible, the condition of the wetland prior to such alteration.

### 6.03 Dams -

In cases where dam construction, modification or maintenance is proposed, the "Application for the Approval of Plans and Specifications" (Section 46-19-3 of the General Laws) must accompany the wetlands application. Both applications will be processed concurrently.

7.00 REVIEW CRITERIA

7.01 General -

In addition to those factors considered under Sections 4.02 and 5.03, the following criteria shall apply.

7.02 Effect on Drainage -

Applications involving changes in the drainage and/or runoff characteristics (including any piping of streams or storm drainage) of an area must be accompanied engineering data certified by a Registered Professional Engineer that defines the anticipated effects of such changes. The engineering data should be based on the flows resulting from a 10-year frequency storm. The engineering data shall include copies of all reference materials and basic data used, computations made therefrom and conclusions reached in regard to existing and proposed flow rates. If a net increase in runoff is indicated, the engineer shall evaluate the effect that the increase will have on peak discharges, with specific reference to local flooding problems. In instances where known local flooding problems exist, the Department shall review the engineering evaluation on a case basis to determine if there will be a significant increase in flooding. If, in the opinion of the Director, there will be significant increase in flooding, a formal application will be required. The use of percolation structures, holding ponds, etc., to contain, and/or detain on-site, the additional runoff resulting from the proposed work is considered a desirable design feature.

7.03 Effect on the Flood Plain -

It is the policy of this Department to allow no reduction in net flood holding capacity of flood plains nor detrimental obstruction of floodways. Applications for alterations of flood plains must be accompanied by a written statement that defines the river's flood elevation during a 100-year frequency storm. The written statement can be in the form of a letter and/or study from the U.S. Army Corps of engineers, Soil Conservation Service or U.S. Geological Survey or in the form of a flood plain

study by a Registered Professional Engineer. The flood plain study shall include copies of all reference materials used, computations made and conclusions reached concerning the flood plain elevation. In keeping with the Department's policy of "Zero Displacement" of flood storage capacity, plans and computations for the proposed alterations shall include measures to be taken to compensate for any flood plain loss (as by excavating at some other location within the same reach of the river) with volume calculations and plans substantiating same.

#### 7.04 Effect on Soil Stability -

- (a) It is the policy of this Department to permit no project to cause sedimentation of fresh water wetlands. Proposed projects must include appropriate erosion and sedimentation control measures in those cases where there exists a potential for sedimentation of any wetland. Plans for such projects must indicate all such erosion and sedimentation controls, whether temporary (employed prior to permanent stabilization) or permanent. Suggested design criteria for sedimentation controls may be found in the Rhode Island Erosion and Sediment Control Handbook prepared by the United States Department of Agriculture's Soil Conservation Service and the Rhode Island State Conservation Committee.
- (b) Generally acceptable temporary controls include among others, sediment basins, stabilized hay bales or fiber mesh lining the limits of work, hay dams across water-courses, and straw mulch with jute netting on disturbed slopes. The Director may require that work be done during periods of low flow.
- (c) Generally acceptable permanent controls include catch basins with three foot sumps, bench terraces, berms, riprap-lined or gabion-lined channels, sediment basins, detention basins and riprap placed at the entrances and outfalls of culverts.
- (d) Sedimentation controls must be maintained at sufficient frequency to ensure continued effectiveness. If the Director finds that controls are inadequate, he may order the permit holder to maintain, replace or augment such controls.

7.05 Effect on Water Quality -

Where the Wetlands Section finds that there exists a substantial question concerning the impact of a proposed alteration on the water quality of a wetland, or where an objection of a substantive nature raising such a question is made to an application, the Wetlands Section shall request from the Division of Water Resources a review of the impact on water quality.

7.06 Effect on the Wildlife Habitat and Recreation -

An ecological field survey and evaluation shall be completed by the Fresh Water Wetlands Section for any fresh water wetland where a significant alteration has been proposed. Such evaluation shall, insofar as possible, be based on geologic origin, soils, surface and groundwater association, existing plant and animal communities, and surrounding land use patterns. Where applicable, such evaluation shall include use of a revised version of the "Wetland - Wildlife Evaluation Model", a numerical system based on wildlife diversity and productivity, found in Models for Assessment of Freshwater Wetlands, University of Massachusetts at Amherst, Publication No. 32. The revised version of this system shall be kept on file in the Wetlands Section. (Refer to 3.02). Review of the anticipated and/or probable effects of the proposed alterations on wildlife habitat and recreational value of the wetland shall be made by a Natural Resource Specialist prior to the final decision. This evaluation shall include a determination of whether the subject wetland is "unique" or "valuable" (as those terms are used in Section 5.03) under the following definitions:

- (a) Unique Wetland - The term "Unique Wetland" as used herein shall refer to those wetlands having special ecological or cultural significance within Rhode Island and possessing one or more of the following characteristics:
- (1) presence of rare or endangered plants or animals;
  - (2) presence of plants of unusually high visual quality and infrequent occurrence;



- (3) presence of plants or animals at or near the limits of their geographic range;
  - (4) unusually high production of native waterfowl;
  - (5) annual use by great numbers of migrating waterfowl, shore birds, marsh birds or wading birds;
  - (6) "outstanding" wildlife diversity and production as determined by the aforementioned "Wetland - Wildlife Evaluation Model";
  - (7) presence of outstanding or uncommon geomorphological features;
  - (8) presence of outstanding archaeological evidence;
  - (9) availability of reliable scientific information concerning the geological, biological or archaeological history of the wetland;
  - (10) designation as rare, endangered, exemplary or unique by the Rhode Island Natural Heritage Program.
- (b) Valuable Wetland - The term "Valuable Wetland" as used herein shall mean any wetland providing valuable wildlife habitat or valuable recreational environment;
- "Valuable Wildlife Habitat" shall refer to:
- (1) those marshes, swamps and bogs which are characterized by "high" diversity and production of wildlife, according to the aforementioned "Wetland - Wildlife Evaluation Model", and
  - (2) those rivers and ponds classified by regulation as Category A, B, or C by the DEM Division of Fish and Wildlife.

"Valuable Recreational Environment" shall mean a relatively natural or undeveloped area which, in its natural state, is capable of supporting recreation by the general public. Typical recreational activities would include, but not be limited to: education, hunting, fishing, trapping, hiking, canoeing, ice skating, skiing, bird watching and nature photography.

7.07 Amendments to the Proposal During Review Period -

If, during the review process, it is found that an application fulfills any one of the criteria which may cause random, unnecessary and/or undesirable destruction of fresh water wetlands (as outlined in Section 5.03) (c) ), the applicant will be so informed as soon as it is practically possible. The applicant may then amend his/her proposal or provide mitigating measures.

8.00 PERMIT

8.01 Permit to Alter Fresh Water Wetlands -

- (a) In accordance with Section 2-1-22 of the Act, the Director may issue permits to alter fresh water wetlands. Each such permit will be in the form of a letter making detailed reference to the subject application and may include any provisions which, in the opinion of the Director, are necessary for the protection of the wetlands.
- (b) A copy of such notice of permit shall be recorded by the owner of the subject property or the applicant, at the expense of the applicant, (and a true copy sent by certified mail to the Director prior to the commencement of work) in the land evidence records of the city/town where the subject property is located

8.02 Notice of Permit Card -

- (a) A yellow card, entitled "Notice of Permit Card" will be sent to the applicant with the permit. This "Notice of Permit Card" must be displayed prominently at the site of the subject project. Such "Notice of Permit" card is hereby made part of these rules and regulations.

8.03 Notice of Beginning and Completion of Work -

Applicant is required to notify this Department in writing at the commencing of the project, and is further required to notify this Department upon completion of the project. Upon receipt of this completion notification, the Department will conduct an on-site inspection.

After on-site inspection of the project and determination that the alteration of the wetland has been completed in accordance with the permit and the conditions of approval and any renewals thereof, the Director shall issue to the applicant or the owner of the subject property a notice of completion of work in letter form. The applicant or owner shall record, at his expense, the notice of completion of work in the land evidence records of the city/town where the subject wetland is located.

9.00 CEASE AND DESIST ORDERS AND RESTORATION ORDERS

9.01 The Director, when necessary in accordance with Sections 2-1-23 and 2-1-24 of the Act, will issue a notice of violation, cease and desist order and/or restoration order to the violator on an appropriate form either directly or by first class certified mail. Such forms are hereby made part of these rules and regulations.

9.02 The phrase To Restore Said Wetland "Within a Reasonable Time", as used in Section 2-1-24 of the Act, shall mean to restore said wetlands within a period of time deemed, by the Director, to be sufficient, based on: The magnitude and nature of the violation, the means or method available in making restoration, and on other factors not within the control of the violator, e.g., weather conditions and labor disputes.

9.03 In accordance with Section 2-1-24 of the Act, the Director shall record notices of violation and/or restoration orders in the land evidence records of the city or town wherein the subject violation lies. The owners or subsequent transferees of the property affected by a violation of the Act or these rules shall be responsible for restoration of the property.

10.00 SUSPENSION OR REVOCATION OF A PERMIT OR PRELIMINARY DETERMINATION

10.01 Where the Director has cause to believe that (a) the information or data submitted by the applicant in support of an application for a preliminary determination or for a permit to alter fresh water wetlands is false or erroneous, or that (b) the project is not being undertaken in strict accordance with the provisions of the permit or the preliminary determination, the Director shall issue a cease and desist order, and/or an order requiring the applicant to show cause why such a permit or preliminary determination should not be revoked or suspended and/or to require the applicant to restore the subject wetlands.

11.00 PUBLIC HEARINGS

11.01 Show Cause Hearings -

Within ten (10) days after the service of a written order to immediately cease and desist activities in violation of Section 2-1-21 of the Act and/or restore said wetland or revoking or suspending a preliminary determination or permit, the violator may make written request that the Director allow him to appear at the Director's office to show cause why such order should not stand. This provision for a show cause hearing in no way releases the violator from the requirements of the order.

11.02 Public Hearings Involving Formal Applications -

(a) When necessary, in accordance with Section 2-1-22 of the act, the Director will hold public hearings on proposed alterations to wetlands. Such hearings will be held in accordance with these rules, the Fresh Water Wetlands Act, the General Laws of 1956, as amended, and such other rules as the Director may prescribe regarding practice before the Department.

(b) Burden of Proof

The Burden of Proof that the subject proposal is not inconsistent with the provisions of the Act and these rules remain with the applicant.

11.03 General Procedures -

(a) Place of hearing

Public hearings will be held at a place designated by the Director. Where such hearing involves a formal application (11.02), such place shall be as convenient as reasonably possible to the site of the proposed project.

(b) Time of hearings

The time of the hearings shall be designated by the Director.

(c) Presiding Officer

The presiding officer shall be the Director or his representative, as designated by him in writing.

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(d) Duties of the Presiding Officer

The presiding officer has the responsibility of hearing the testimony of the witnesses and for making determinations under the Act and these rules. His/ her opinion as to admissibility shall be final.

(e) Change of Presiding Officer

The presiding officer may be changed by the Director at any time or times, provided, however, that no changes of presiding officer shall be allowed once said officer has begun a hearing on any application filed pursuant to this Act.

(f) Witnesses

All witnesses shall be sworn by the presiding officer. The witnesses shall be subject to examination by the presiding officer, parties to the proceeding, their counsel, and at the discretion of the presiding officer, any other interested persons.

(g) Prehearing Conferences

(1) Formal Applications -

The Director, at his/her discretion and/or upon request of the applicant may arrange for a prehearing conference to clarify or simplify the issues raised in the formal application, accept documentary evidence, or deal with other such matters as may aid in the disposition of the proceeding.

(2) Show-cause Hearings -

Prior to scheduling a formal show-cause hearing regarding a cease and desist order, the Director, through the Wetlands Section, may in its discretion convene a prehearing conference for the purposes listed in 11.03 (g), (1), and for the purpose of discussing the facts and issues raised in such order with the violator. The Wetlands Section shall give notice of conference to any complainant upon his request.

(h) Consent Orders

At any time prior to the issuance of a written decision and order by a hearing officer appointed by the Director subsequent to a hearing, an order may be entered, with the consent of the Wetlands Section and the violator, disposing of the matters alleged in a cease and desist order, or restoration order, or order revoking or suspending a preliminary determination or permit. Such consent order shall be deemed an order of the Director for purposes of prosecution pursuant to Rhode Island General Laws, Sections 2-1-23 and 24. A copy of such notice shall be furnished to complainant upon his request.

(i) Submission of Documentary Evidence in Advance

When necessary and practicable, the Director may require that all documentary evidence to be offered during a public hearing be submitted to him and to other appropriate parties in advance of the hearing date. Such advance submission will facilitate study of the material and preparation of cross-examination and rebuttal evidence.

(j) Continuances

The Director may, at his discretion, grant a continuance of the public hearing, upon request, if such request is made promptly and is shown to be necessary. During a hearing, if it appears in the public interest or in the interest of justice that further testimony or argument should be received, the Director may, at his discretion, continue the hearing by oral notice and fix the date for the introduction of additional evidence or presentation of argument. Such oral notice shall constitute final notice of such continued hearing.

(k) Reopening of Hearing

At any time after a hearing has been closed, but prior to the filing of his decision, the Director may reopen the proceeding to receive further evidence and/or to hear further argument.



(1) Decisions and Orders

Subsequent to the conclusion of the hearings, the presiding officer shall issue his/her decision based upon the record of the hearing separately stating all findings of the fact and conclusions of law. In the case of formal applications, such decision shall include an order denying or approving the application and may make the issuance of a permit to alter wetlands conditional on the prior submissions and approval of plans and specifications by the Fresh Water Wetlands Section and on such other conditions as he/she may determine to be necessary to diminish the impact on the subject wetland. Copies of the Decision and/or Order on a formal application shall be sent to the applicant and to those objecting to the application during the 45-day notice period and to other parties upon request.

12.00 FEES

12.01 The Director will assess a twenty-five dollar (\$25) fee for the filing of an application for approval to alter a fresh water wetland. All public agencies are exempt from this fee. Such fee is assessed to cover investigation and notification costs incurred pursuant to Section 2-1-22 of the Act.

12.02 In addition, the applicant will be liable for fees to cover costs incurred in the holding of a public hearing, if required under Section 2-1-22 of the Act. The applicant is required to reimburse the Department a reasonable fee to defray the costs incurred for all investigation, notices, publications and hearings required by Rhode Island General Laws, Section 2-1-22, relating to formal applications. The applicant shall reimburse the Department the following charges:

Newspaper Publication - actual cost.

Notices - actual cost of postage.

Recording of Proceedings - actual cost of appearance of stenographer and original transcript.

Location of Hearing - actual cost, if any, of renting a room or hall for the hearing.

The applicant shall pay to the Department of Environmental Management prior to the issuance of a notice of hearing the sum of \$300 as a deposit against the actual costs listed above.

13.00 APPLICABILITY

The above-stated rules and regulations shall be applicable to any and all completed applications filed with the Director on or after the effective date of these rules and to any and all orders or notices issued by the Director on or after the effective date of these rules.

14.00 SEVERABILITY

If any section or provision of these rules and regulations is held invalid by a court of competent jurisdiction, the remaining sections or provisions of these rules and regulations shall not be affected thereby.

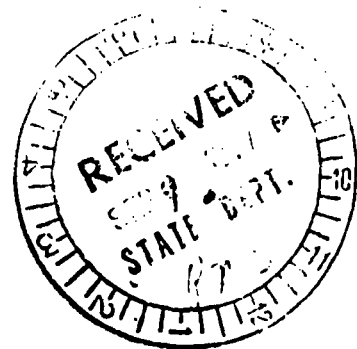
APPENDIX

FLOOD HAZARD STUDIES OF FEBRUARY 8, 1980

1. Flood Hazard Analyses Annaquatucket River, North Kingstown, Rhode Island, dated November, 1975, prepared by the United States Department of Agriculture Soil Conservation Service.
2. Flood Hazard Analyses Bailey Brook, Middletown, Rhode Island, dated September, 1974, prepared by the United States Department of Agriculture Soil Conservation Service.
3. Flood Plain Information Blackstone River, Cumberland, Lincoln, Central Falls and Pawtucket, Rhode Island, dated June, 1971, prepared by the Department of the Army New England Division, Corps of Engineers.
4. Flood Hazard Analyses Pocasset River and Meshanticut Brook, Cranston, Rhode Island, dated September, 1973, prepared by the United States Department of Agriculture Soil Conservation Service.
5. Addendum Flood Hazard Analyses Pocasset River and Meshanticut Brook, Cranston, Rhode Island, dated December, 1974, prepared by the United States Department of Agriculture Soil Conservation Service.
6. Flood Hazard Analyses Pocasset River, Johnston, Rhode Island, dated April, 1975, prepared by the United States Department of Agriculture Soil Conservation Service.
7. Flood Hazard Analyses Sand Hill Brook and Mill Creek, North Kingstown, Rhode Island, dated December, 1975, prepared by the United States Department of Agriculture Soil Conservation Service.
8. Flood Hazard Analyses Saugatucket River and Tributaries, South Kingstown Rhode Island, dated February, 1976, prepared by the United States Department of Agriculture Soil Conservation Service.

DEPARTMENT OF HEALTH  
DIVISION OF WATER SUPPLY

PUBLIC DRINKING WATER REGULATIONS



9 September 1977

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1. Definitions

- 1.1 Maximum Contaminant Level - The maximum permissible level of a contaminant present in the water. It applies to the water at a point of entry into the distribution system and at any point of use of the distribution system with the exception of turbidity which pertains only to a surface water source determined at a point of entry into the distribution system.
- 1.2 Public Water System - A system for the provision to the public of piped water for human consumption, provided such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year.
- The term "public water system" shall include all sources, and facilities involved in collecting, treating, storing and distributing the water.
- 1.3 Community Water System - A public water system which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.
- 1.4 Non-Community Water System - A public water system that is not a community water system.
- 1.5 Sanitary Survey - An on-site review of the water source, facilities, equipment, operation, and maintenance of a public water system for the purpose of evaluating the adequacy of such source, facilities, equipment, operation, and maintenance for producing and distributing safe drinking water.
- 1.6 Director - The word director as it appears shall be held to mean the Director of the Rhode Island Department of Health

or his duly authorized agent.

- 1.7 Person - The word "person" shall include an individual, partnership, association, or corporation, or any town or city or any agency thereof, or the state or any agency thereof, or any other legal entity.
- 1.8 Water Purveyor - Any person who owns or operates a public water system.
- 1.9 Dose Equivalent - The absorbed dose from ionizing radiation expressed in terms of Rads multiplied by such a factor as account for differences in biological effectiveness due to the type of radiation and its distribution in the body as specified by the International Commission on Radiological Units and Measurements (ICRU).
- 1.10 Rem - The unit of dose equivalent from ionizing radiation to the total body or any internal organ or organ system. A "millirem (mrem)" is 1/1000 of a rem.
- 1.11 Picocurie (pCi) - A unit of radioactivity equal to 2.22 nuclear transformations per minute.
- 1.12 Gross Alpha Particle Activity - The total radioactivity due to alpha particle emission as determined from measurements on a dry sample.
- 1.13 Manmade Beta Particle and Photon Emitters - All radionuclides emitting beta particles and/or photons listed in Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air or Water for Occupational Exposure, NBS Handbook 69, except the daughter products of thorium -

232, uranium - 235, and uranium - 238.

- 1.14 Gross Beta Particle Activity - The total radioactivity due to beta particle emission as determined from measurements on a dry sample.
- 1.15 Rad - Unit of absorbed dose equal to 100 ergs per gram in any medium.
2. Coverage - These regulations apply to any public water system unless a public water system meets all of the following conditions:
  - 2.1 The system consists only of distribution or storage facilities (and does not have any collection or treatment facilities).
  - 2.2 The system obtains all of its water from a public water system to which these regulations apply.
  - 2.3 The system does not sell water to any person.
3. New Water Sources - No source of water shall be developed for a public water system until a site plan prepared by a professional engineer or land surveyor registered in accordance with Chapter 5-8 of General Laws of Rhode Island, as amended, has been approved by the director. In the case of a proposed gravel packed or gravel developed well, the site plan shall contain pertinent information within at least 1,000 feet of the proposed well including, but not limited to, the location of existing and proposed sewage disposal systems and any other existing or proposed potential sources of pollution. Generally, the land within 400 feet of such wells shall be reserved for protection of the water quality of the well. This distance may be modified at the discretion of the director taking into consideration such factors

as the volume and type of waste material to be disposed or stored in close proximity to the land area reserved for protection of the well, the projected yield of the well, the depth below grade to impervious formation, the depth below grade to the water table, the type of soil in the area, or any other factors the director deems pertinent.

In the case of a proposed drilled (rock), driven, or dug well, the site plan shall show pertinent information within at least 500 feet of the proposed well including, but not limited to, the location of existing and proposed sewage disposal systems and any other existing or proposed potential sources of pollution. Generally, the land within 200 feet of such wells shall be reserved for protection of the water quality of the well. This distance may be modified at the discretion of the director taking into consideration such factors as the volume and type of waste material to be disposed or stored in close proximity to the land area reserved for protection of the well, the depth below grade to impervious formation, the depth below grade to the water table, the type of soil in the area, or any other factors the director deems pertinent.

4. Approval of Treatment Works, Storage and Pumping Facilities - No new water treatment works or water storage or pumping facilities shall be constructed or such existing works or facilities substantially altered until plans and specifications prepared by a professional engineer registered in accordance with Chapter 5-8 of the General Laws of Rhode Island, as amended, have been approved by the director.

5. Disinfection - All newly constructed public water systems or additions to existing systems shall be flushed, adequately disinfected, and the water examined for the presence of coliform organisms in accordance with the fourteenth edition of "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, American Water Works Association, Water Pollution Control Federation. No system shall be placed in use until such examinations disclose the absence of coliform organisms.
6. Connections Between Distribution Systems - No person shall maintain a physical connection joining a public water system with any other water system, unless such connection is approved by the director.
7. Tanks Connected to Unsafe Supplies - Any person who maintains a public water system connection to a tank which is also supplied with water from a water system found by the director to be unsafe shall maintain the tank open to atmospheric pressure, and the public water supply pipe shall terminate at least two pipe diameters above the maximum level of water in the tank. The tank overflow shall be of adequate size to fix definitely the maximum level.
8. Avoidance of Contamination in Tanks - Any person who is furnished water from a public water system and maintains a tank supplied only by such water shall have such tank so constructed and maintained to prevent contaminants from gaining access to the tank interior.
9. Assurance of Safety in Public Supply - Any person maintaining a public water system shall operate and maintain the water supply facilities so that the water furnished the public is safe.

10. Correction of Unsafe Conditions - When the water from a public water system is not safe or is subject to contamination, as determined by the director, the person maintaining such public water system shall take immediate action to correct sanitary defects, improve operation, provide necessary water treatment, or make any other changes or additions deemed necessary by the director to provide safe water.
11. Reports as to Public Supplies - Any person maintaining a public water system shall submit or cause to be submitted by operating personnel such reports of operation pertaining to the sanitary quality, treatment and output as may be required by the director. Such operation reports shall be submitted within fifteen (15) days after demand and shall be accurate and complete as required by the director. Violations of maximum contaminant levels shall be reported to the director within 48 hours after such a determination is made.
12. Certified Laboratories - For the purpose of determining compliance with these regulations, only analyses carried out by the Department of Health or in a laboratory approved by the Department of Health will be considered with the exception of turbidity determinations.
13. Ground Water Microbiology - Ground water sources shall meet the stipulated microbiological standard prior to disinfection where disinfection is practiced.
14. Consecutive Water System Monitoring - These regulations pertain to a public water system which is supplied by another public water system except as specifically modified by the director and agreed upon by the U. S. E.P.A. Administrator.

15. Variations and Exemptions - Variations and exemptions to these regulations may be granted by the director in accordance with the provisions of Sections 300g-4 and 300g-5 of 42 USC (Section 1415 and Section 1416 of Public Law 93-523) and Chapter 42-35 of the Rhode Island General Laws of 1956, as amended.

16. Community Water System Requirements

16.1 Inorganic Chemicals

Maximum contaminant levels for certain inorganic chemicals:

<u>Contaminant</u>	<u>Milligrams Per Liter</u>	<u>Contaminant</u>	<u>Milligrams Per Liter</u>
Arsenic (As)	0.05	Lead (Pb)	0.05
Barium (Ba)	1.	Mercury (Hg)	0.002
Cadmium (Cd)	0.010	Nitrate (as N)	10.
Chromium (Cr)	0.05	Selenium (Se)	0.01
Fluoride (F)	2.0	Silver (Ag)	0.05

Monitoring Frequency - Each active drinking water source maintained by a water purveyor shall be analyzed annually and in addition whenever there is reason to believe an inorganic maximum contaminant level is or may be exceeded. On each source where the fluoride concentration is artificially adjusted, a fluoride determination of the treated water shall be made and recorded daily by the water purveyor.

Analytical Techniques - Inorganic chemical analyses shall be made in accordance with the methods specified in the fourteenth edition of "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association,

American Water Works Association, Water Pollution Control Federation.

16.2 Organic Chemicals

Maximum contaminant levels for certain organic chemicals:

<u>Contaminant</u>	<u>Milligrams Per Liter</u>	<u>Contaminant</u>	<u>Milligrams Per Liter</u>
Endrin	0.0002	Toxaphene	0.005
Lindane	0.004	2,4-D	0.1
Methoxychlor	0.1	2,4,5-TP Silvex	0.01

Monitoring Frequency - Each active drinking water source maintained by a water purveyor shall be analyzed prior to 24 June 1978 and thereafter at least once every other calendar year and in addition whenever there is reason to believe an organic chemical maximum contaminant level is or may be exceeded.

Analytical Techniques - Organic chemical analyses shall be made in accordance with the analytical procedures set forth in the fourteenth edition of "Standard Methods for the Examination of Water and Wastewater," published by the American Public Health Association, American Water Works Association, Water Pollution Control Federation.

16.3 Turbidity

Applicability - The maximum contaminant level for turbidity applies only to surface water sources. The turbidity of the water shall be determined and recorded daily by the water



purveyor and measured at a representative entry point into the distribution system.

Maximum Contaminant Level for Turbidity - The maximum contaminant level for turbidity shall not exceed a monthly average of 1 turbidity unit (TU). An average of five (5) turbidity units shall not be exceeded for any 2 consecutive days.

Analytical Techniques - Turbidity measurements shall be made by the Nephelometric Method in accordance with the procedures set forth in the fourteenth edition of "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, American Water Works Association, Water Pollution Control Federation.

#### 16.4 Microbiological

Sampling - Samples for coliform organism examinations shall be collected on a schedule approved by the director at points which are representative of the conditions within the distribution system.

The number of distribution system samples examined each month for the presence of coliform organisms shall be a function of the population served by the system according to the following:

<u>Population Served</u>	<u>Min. Number of Samples Per Mo.</u>	<u>Population Served</u>	<u>Min. Number of Samples Per Mo.</u>
*25 to 1,000	1	23,201 to 24,000	27
1,001 to 2,500	2	24,001 to 24,900	28
2,501 to 3,300	3	24,901 to 25,000	29
3,301 to 4,100	4	25,001 to 28,000	30
4,101 to 4,900	5	28,001 to 33,000	35
4,901 to 5,800	6	33,001 to 37,000	40
5,801 to 6,700	7	37,001 to 41,000	45
6,701 to 7,600	8	41,001 to 46,000	50
7,601 to 8,500	9	46,001 to 50,000	55
8,501 to 9,400	10	50,001 to 54,000	60
9,401 to 10,300	11	54,001 to 59,000	65
10,301 to 11,100	12	59,001 to 64,000	70
11,101 to 12,000	13	64,001 to 70,000	75
12,001 to 12,900	14	70,001 to 76,000	80
12,901 to 13,700	15	76,001 to 83,000	85
13,701 to 14,600	16	83,001 to 90,000	90
14,601 to 15,500	17	90,001 to 96,000	95
15,501 to 16,300	18	96,001 to 111,000	100
16,301 to 17,200	19	111,001 to 130,000	110
17,201 to 18,100	20	130,001 to 160,000	120
18,101 to 18,900	21	160,001 to 190,000	130
18,901 to 19,800	22	190,001 to 220,000	140
19,801 to 20,700	23	220,001 to 250,000	150
20,701 to 21,500	24	250,001 to 290,000	160
21,501 to 22,300	25	290,001 to 320,000	170
22,301 to 23,200	26		

\*If a community water system utilizing only ground water sources serves 25 to 1,000 persons, the minimum number of distribution system samples examined may be reduced to 1 per quarter at the discretion of the director.

Analytical Techniques - Coliform organism examinations shall be made in accordance with the analytical procedures set forth in the fourteenth edition of "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, American Water Works Association, Water

Pollution Control Federation.

Bacterial Maximum Contaminant Level - Membrane Filter Technique -

The number of coliform organisms found shall not exceed a monthly arithmetic mean of 1 per 100 milliliters. No single sample shall exceed 4 coliform organisms per 100 milliliters when less than 20 samples are examined per month. When 20 or more samples are examined per month, the number of coliforms shall not exceed 4 per 100 ml in more than 5 percent of the samples examined.\*

Bacterial Maximum Contaminant Level - Fermentation Tube Technique -

Coliform organisms shall not be present in more than 10 percent of the 10 milliliter portions examined per month. No single sample shall yield 3 or more coliform positive 10 milliliter portions when less than 20 samples per month are examined. When 20 or more samples are examined per month, not more than 5 percent of the samples examined shall yield 3 or more coliform positive 10 milliliter portions.\*

Check Samples - When the number of coliform organisms in a sample as determined by the membrane filter technique exceeds 4 per 100 milliliters, daily check samples shall be collected and examined until the results obtained from at least 2 consecutive samples show less than 1 coliform organism per 100 milliliters. When a sample shows 3 or more positive 10

\*Compliance at the discretion of the director may be based upon a quarterly rather than monthly reporting period provided the minimum required number of samples for the system is less than four per month.

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milliliter portions following the fermentation tube technique, daily check samples shall be collected and examined until the results obtained from at least 2 consecutive samples show no positive tubes.

Such check or any special purpose sample shall not be included when calculating the monthly arithmetic mean nor when counting the total number of samples examined for the month. A check sample point shall not be dropped as a future sampling station unless approved by the director.

16.5 Radioactivity

Monitoring Frequency - Each source of a community water system shall be analyzed for gross alpha particle activity and, if necessary, Radium 226 and Radium 228 at least once every 3 years. Each surface water source only of a community water system shall be analyzed for manmade radioactivity at least once every 4 years provided such system serves in excess of 100,000 persons.

Maximum Contaminant Level for Gross Alpha Particle Activity and Radium 226 and 228 -

<u>Contaminant</u>	<u>Picocuries per Liter (pCi/l)</u>
Radium 226 and Radium 228 Combined	5
Gross alpha particle activity	*15

\*If the gross alpha particle activity is 5 pCi/l or less, there is no need to analyze for Radium 226 and Radium 228. If the gross alpha particle activity exceeds 5 pCi/l, the sample must be analyzed for Radium 226. If the concentration of Radium 226 exceeds 3 pCi/l, the concentration of Radium 228 shall be determined.

Maximum Contaminant Level for Manmade Beta Particle and

Photon Emitters - The average annual concentration of manmade beta particle and photon emitters shall not produce an annual dose equivalent of 4 millirems/year.

Compliance may be assumed if the average annual concentration of gross beta particle activity is less than 50 pCi/l and the average annual concentration of tritium and strontium 90 are less than 20,000 pCi/l and 8 pCi/l respectively and the sum of their annual dose equivalent does not exceed 4 millirems/year.

Analytical Techniques - Analyses to determine compliance with the radioactivity requirements shall be made in accordance with the methods specified in the fourteenth edition of "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, American Water Works Association, Water Pollution Control Federation. Compliance shall be based on a composite sample of 4 quarterly samples or the average result obtained from the analyses of four samples collected at four successive quarterly intervals.

- 16.6 Public Notification - The water purveyor shall notify each customer in writing within 3 months of any variance or exemption granted by the director or any failure to comply with these regulations. Such notice shall be repeated every 3 months as long as the failure continues or the variance or exemption remains in effect. Consumers shall be similarly notified if the conditions of a variance or exemption are not fulfilled.

Whenever a maximum contaminant level is exceeded, and the condition is not corrected promptly after discovery, additional public notification shall be made by the water purveyor in a manner approved by the director.

16.7 Records - Records of analyses performed outside the Department of Health shall be maintained by the water purveyor. The records of each sample analyzed to comply with these regulations shall contain the following information:

1. The time, date, and place of sampling and the name of the sample collector
2. The sampling point and the reason for collection
3. Date analysis started and completion date if more than one day is needed
4. Name of laboratory and person responsible for performing the analysis
5. The analytical technique or method used
6. The results of the analysis

Records of microbiological examinations shall be readily available for at least 5 years.

Records of organic and inorganic chemical, radiological, and turbidity analyses shall be readily available for at least 10 years.

Any written document relating to a sanitary survey of a public water system shall be kept for at least 10 years.

Records of action taken to correct a violation of these

regulations shall be kept for at least 3 years after the last action taken with respect to the particular violation involved.

Records concerning a variance or exemption granted to a system shall be kept for at least 5 years following the expiration date of such variance or exemption.

17. Non-Community Water System Requirements

17.1 Microbiological

Sampling - At least one representative distribution system sample shall be examined for the presence of coliform organisms each calendar quarter during which the system is in operation.

Analytical Procedure - Coliform organism examinations shall be made in accordance with the analytical procedures set forth in the fourteenth edition of "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, American Water Works Association, Water Pollution Control Federation.

Bacterial Maximum Contaminant Level - Membrane Filter Technique -

The number of coliform organisms found shall not exceed an average of 1 per 100 milliliters in samples examined in any 3 month period or fraction thereof. No sample shall exceed 4 coliform organisms per 100 milliliters.

Bacterial Maximum Contaminant Level - Fermentation Tube Technique -

Coliform organisms shall not be present in more than 10 percent of the 10 milliliter portions examined in any 3 month period or fraction thereof. No sample shall yield 3 or more coliform

positive 10 milliliter portions.

Check Samples - When the number of coliform organisms in a sample as determined by the membrane filter technique exceeds 4 per 100 milliliters, daily check samples shall be collected and examined until the results obtained from at least 2 consecutive samples show less than 1 coliform organism per 100 milliliters. When a sample shows 3 or more positive 10 milliliter portions following the fermentation tube technique, daily check samples shall be collected and examined until the results obtained from at least 2 consecutive samples show no positive tubes.

Such check or any special purpose sample shall not be included when calculating the monthly arithmetic mean nor when counting the total number of samples examined for the month. A check sample point shall not be dropped as a future sampling station unless approved by the director.

## 17.2 Nitrate

Maximum Contaminant Level - The maximum contaminant level for nitrate (expressed as N) is 10 milligrams per liter.

Monitoring Frequency - The nitrate concentration of each active drinking water source maintained by a water purveyor shall be determined annually.

Analytical Techniques - Nitrate analyses shall be made in accordance with the methods specified in the fourteenth edition of "Standard Methods for the Examination of Water



and Wastewater" published by the American Public Health Association, American Water Works Association, Water Pollution Control Federation.

17.3 Turbidity

Applicability - The maximum contaminant level for turbidity applies only to surface water sources. The turbidity of the water shall be determined and recorded daily by the water purveyor and measured at a representative entry point into the distribution system.

Maximum Contaminant Level for Turbidity - The maximum contaminant level for turbidity shall not exceed a monthly average of 1 turbidity unit (T.U.). An average of five (5) turbidity units shall not be exceeded for any 2 consecutive days.

Analytical Techniques - Turbidity measurements shall be made by the Nephelometric Method in accordance with the procedures set forth in the fourteenth edition of "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, American Water Works Association, Water Pollution Control Federation.

17.4 Public Notification - Whenever a variance or exemption is granted or there is failure to comply with any of these regulations, the water purveyor shall notify consumers in a manner approved by the director. Consumers shall also be notified by the water purveyor in a manner approved by the director if the conditions of a variance or exemption

are not fulfilled. A notice shall be easily understood, complete, and conspicuous, both as regard to location and size of print, and shall clearly present the facts.

17.5 Records

Records of analyses performed outside the Department of Health shall be maintained by the water purveyor. The record of each sample analyzed to comply with these regulations shall contain the following information:

1. The time, date, and place of sampling and the name of the sample collector
2. The sampling point and the reason for collection
3. Date analysis started and completion date if more than one day is needed
4. Name of laboratory and person responsible for performing the analysis
5. The analytical technique or method used
6. The results of the analysis

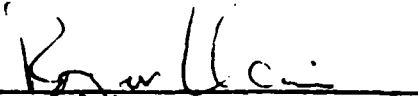
Records of microbiological examinations shall be readily available for at least 5 years and records of nitrate analyses and turbidity determinations shall be readily available for 10 years. Any written document relating to a sanitary survey of a public water system shall be kept for at least 10 years.

Records of action taken to correct a violation of these regulations shall be kept for at least 3 years after the

last action taken with respect to the particular violation involved.

Records concerning a variance or exemption granted to a system shall be kept for at least 5 years following the expiration date of such variance or grant.

The foregoing rules and regulations, after due notice and hearing, are hereby adopted and filed with the Secretary of State this ninth day of September 1977, to become effective twenty (20) days thereafter, in accordance with the provisions of Chapter 46-13 and 42-35 of the General Laws of Rhode Island, 1956, as amended.

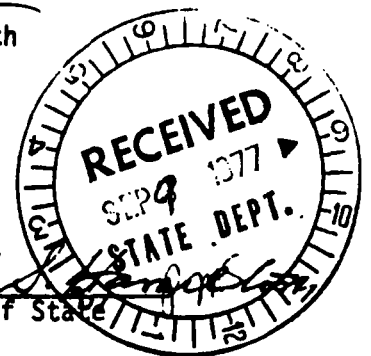
  
Roger Klein  
Acting Director of Health

Notice given on 12 May 1977

Hearing held on 6 June 1977

Filed: 9 September 1977

  
Secretary of State  
*Ed. Dep.*



*John*  
*McNair 6/11*  
*Ray [unclear]*  
*[unclear]*

Underground Injection Control Program  
Rules and Regulations

State of Rhode Island and Providence Plantations  
Department of Environmental Management  
Division of Water Resources

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Section 1

PURPOSE

It is the purpose of these regulations to preserve the quality of the groundwater of the State and thereby protect groundwater from contamination by discharge from injection wells and other subsurface waste disposal of hazardous and other wastes. It is the policy of the Department of Environmental Management to assure the proper location, design, construction, maintenance and operation of injection wells and other subsurface disposal systems to prevent such groundwater contamination. Therefore, it is in the public interest that the following regulations be enforced pursuant to the authority of Chapter 42-17.1 and Chapter 46-12 of the Rhode Island General Laws.

Section 2: Definitions

- 2.01 Aquifer - a geologic formation, group of formations, or part of a formation that is capable of yielding a significant amount of water to a well or spring.
- 2.02 Director - the Director of the Department of Environmental Management or any designee.
- 2.03 Disposal - discharge, deposit, injection, dumping, spilling, leaking, or placing any waste into or on any land.
- 2.04 Domestic Sewage - wastewaters originating from residential dwellings and consisting primarily of human and household wastes.
- 2.05 Facility - any injection well, either state, privately or federally owned, or any other structure or equipment subject to the provisions of these rules and regulations.
- 2.06 Fluid - any material or substance which flows or moves whether in a semi-solid, liquid, sludge, gas, or any other form or state.
- 2.07 Formation - a mappable unit of consolidated or unconsolidated rock characterized by a degree of lithologic homogeneity.
- 2.08 Groundwater - water below the land surface in a zone of saturation.
- 2.09 Hazardous Waste - defined as in the Rhode Island Hazardous Waste Management Act (Title 23 Chapter 19.1).
- 2.10 Person - an individual, trust, firm, joint stock company, corporation, (including a quasi-government corporation) partnership, association, syndicate, municipality, municipal or state agency, fire district, club, non-profit agency or any subdivision, commission, department, bureau, agency or department of state or federal government (including quasi-government corporation) or of any interstate body.
- 2.11 Pollution - the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water.
- 2.12 Public Water System - a system providing the public with piped water for human consumption; provided such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily for at least 60 days out of the year.
- 2.13 Underground Source of Drinking Water (USDW) - an aquifer or its portion which:
- a) (1) supplies any public water system; or

- (2) contains a sufficient quantity of groundwater to supply a public water system; and
  - i. currently supplies drinking water for human consumption; or
  - ii. contains fewer than 10,000 mg/l total dissolved solids.

2.14 Well - a bored, drilled or driven shaft, or a dug hole, whose depth is greater than the largest surface dimension.

2.15 Well Injection - the subsurface emplacement of fluids through a well.

### Section 3: Application

3.01 These rules apply to injection wells, subsurface disposal systems of a non-domestic nature and multiple dwelling, community or regional system for the injection of domestic wastes. These rules do not apply to injection wells or subsurface disposal systems used to dispose of individual or single family residential domestic waste.

3.02 These rules do not apply to the disposal of domestic waste discharged to a subsurface disposal system except in the case of utilization of a well, septic tank or cesspool or any other means which meets the definition of a bored, drilled or driven shaft, or a dug hole, whose depth is greater than the largest surface dimension.

### Section 4: Effective Date and Notification

4.01 These rules shall be effective when adopted by the Director and filed in the Office of the Secretary of State pursuant to Chapters 42-17.1 and 46-12 of the General Laws of Rhode Island of 1956, as amended.

4.02 Any person operating a system to inject fluid into the ground at the time of the effective date of these rules and regulations shall notify the Director of the existence of such system and shall have one (1) year from the effective date of these rules and regulations to apply for the necessary order of approval.

### Section 5: Prohibitions

5.01 No person shall install, construct, alter, repair, or cause to be installed, constructed, altered, or repaired any Class I, II, III or IV injection wells as defined in 11.01.



- 5.02 No person shall dispose of hazardous waste into any other subsurface disposal system unless it is in accordance with the Hazardous Waste Management Facility Operating Rules and Regulations pursuant to the General Laws of 1956, Chapters 42-35, 42-17.3 and 23-19.1.
- 5.03 No person shall operate any facility which:
- (a) pollutes or endangers the groundwater quality of the state; or
  - (b) violates any rule, regulation or standard of any Federal or State agency.

Section 6: Orders of Approval

- 6.01 No person shall inject fluid into the ground unless such person has first obtained an order of approval from the Director.
- 6.02 No person shall install, construct, alter, repair, or cause to be installed, constructed, altered, or repaired, any injection well until such person has obtained written approval of the plans and specifications of the work from the Director.
- 6.03 No person shall dispose of fluid through other means of subsurface disposal unless such person has first obtained an order of approval from the Director.
- 6.04 No person shall install, construct, alter, repair, or cause to be installed, constructed, altered, or repaired, any subsurface disposal system used to dispose of waste of a non-domestic nature until such person has obtained written approval of the plans and specifications of the work from the Director.

Section 7: Conditions for Approval

- 7.01 An order of approval shall be obtained by providing the Director with plans, specifications, sample analysis for priority pollutants and other information that is required to establish affirmative evidence that the facility for which the application is being made will be in compliance with the rules and regulations that are lawfully prescribed under Chapters 42-17.1, 46-12, and 23-19.1.
- 7.02 An order of approval shall be granted only for those facilities which the applicant can show by a preponderance of evidence, will be located, designed, constructed and operated so as to prevent the following:
- a) pollution or endangerment of the groundwater quality in the State,
  - b) violation of any rule or regulation or standard of any Federal or State agency.

Section 8: Order of Compliance

8.01 If any person is found by the Director to be in violation of these regulations, the Director shall make his findings in writing to that effect and shall enter an order directing such person to cease discharging and close the injection well or to adopt, use, or to operate properly, as the case may be some practicable and reasonably available system. Such order may specify the particular system or means to be adopted, used or operated. However, in the case where there is more than one such practicable and reasonably available system or means, such order shall give to the person violating these regulations the right to adopt or use such one of said systems or means as said person may choose.

Section 9: Approval of System Selected

9.01 The person against whom such order of compliance is entered shall, in a manner consistent with the provisions of these rules and regulations, submit to the Director a plan or statement describing the system or means which he proposes to adopt before proceeding to install any such system or means.

9.02 In case such person subsequently desires to make any substantial change in such system or means so adopted, he shall, before proceeding to do so, file with the Director a plan or statement describing such change.

Section 10: Proceedings for Enforcement

10.01 The Superior Court of Providence County shall have jurisdiction in equity to enforce the provisions of these rules and regulations or order issued pursuant thereto. Proceedings for enforcement shall be instituted and prosecuted in the name of the Director and in such proceeding in which injunctive relief is sought, it shall not be necessary for the Director to show that without such relief the injury which will result will be irreparable or that the remedy at law is inadequate.

Section 11: Injection Well Classification System

11.01 Injection wells shall be approved or prohibited according to the following system:

(a) Class I (Prohibited)

1) Wells used by generators or hazardous waste or owners or

operators of hazardous waste management facilities to inject hazardous waste beneath the lowermost formation containing, within one quarter mile of the well bore, an underground source of drinking water.

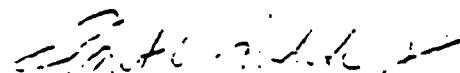
- 2) Other industrial and municipal disposal wells which inject fluids beneath the lowermost formation containing, within one quarter mile of the well bore, an underground source of drinking water.
- (b) Class II (Prohibited) Wells which inject fluids:
- 1) Which are brought to the surface in connection with conventional oil or natural gas production and may be commingled with wastewaters from gas plants which are an integral part of production operations, unless those waters are classified as a hazardous waste at the time of injection.
  - 2) For enhanced recovery of oil or natural gas; and
  - 3) For storage of hydrocarbons which are liquid at standard temperature and pressure.
- (c) Class III. (Prohibited) Wells which inject for extraction of minerals including:
- 1) Mining of sulfur by the Frasch process;
  - 2) In situ production of uranium or other metals; this category includes only in situ production from ore bodies which have not been conventionally mined. Solution mining of conventional mines such as stopes leaching is included in Class V.
  - 3) Solution mining of salts or potash.
- (d) Class IV (Prohibited)
- 1) Wells used by generators of hazardous waste or of radioactive waste, by owners or operators of hazardous waste management facilities, or by owners or operators of radioactive waste disposal sites to dispose of hazardous waste or radioactive waste into a formation which within one quarter ( $\frac{1}{4}$ ) mile of the well contains an underground source of drinking water.
  - 2) Wells used by generators of hazardous waste or of radioactive waste, by owners or operators of hazardous waste management facilities, or by owners or operators of radioactive waste disposal sites to dispose of hazardous waste or radioactive waste above a formation which within one quarter ( $\frac{1}{4}$ ) mile of the well contains an underground source of drinking water.

- 3) Wells used by generators of hazardous waste or owners or operators of hazardous waste management facilities to dispose of hazardous waste, which cannot be classified under paragraphs (a)(1) or (d)(1) and (2) of this section (e.g., wells used to dispose of hazardous waste into or above a formation which contains an aquifer).

(e) Class V wells include:

- 1) Cesspools or other devices that receive wastes, which have an open bottom and sometimes have perforated sides. (The UIC requirements do not apply to single family residential cesspools.)
- 2) Dry wells used for the injection of wastes into a subsurface formation.
- 3) Septic system wells used to inject the waste or effluent from a multiple dwelling, business establishment, community or regional business establishment septic tank; or for a multiple dwelling, community or regional cesspool. (The UIC requirements do not apply to single family waste disposal systems.)
- 4) Air conditioning return flow wells used to return to the supply aquifer the water used for heating or cooling in a heat pump.
- 5) Cooling water return flow wells used to inject water previously used for cooling.
- 6) Drainage wells used to drain surface fluid, primarily storm runoff, into a subsurface formation.
- 7) Recharge wells used to replenish the water in an aquifer.
- 8) Salt water intrusion barrier wells used to inject water into a fresh water aquifer to prevent the intrusion of salt water into the fresh water.
- 9) Sand backfill wells used to inject a mixture of water and sand, mill tailings or other solids into mined out portions of subsurface mines.
- 10) Subsidence control wells (not used for the purpose of oil or natural gas production) used to inject fluids into a non-oil or gas producing zone to reduce or eliminate subsidence associated with the overdraft of freshwater.
- 11) Wells used for the storage of hydrocarbons which are gases at standard temperature and pressure.
- 12) Geothermal wells used in heating and aquaculture.
- 13) Nuclear disposal wells.

The foregoing rules and regulations, after due notice and hearing, are hereby adopted and filed with the Secretary of State this 21st day of May, 1984, to become effective twenty (20) days thereafter, in accordance with the provisions of Chapter 46-12, 42-17 and 42-35 of the General Laws of Rhode Island, 1956, as amended.

  
\_\_\_\_\_  
Robert L. Sendick, Jr., Director  
Department of Environmental Management

Notice given on July 21, 1983  
Hearing held on August 24, 1983  
Effective \_\_\_\_\_, 1984

The foregoing rules and regulations are hereby approved for filing with the Secretary of State in accordance with the provisions of the General Laws of Rhode Island, 1956, as amended, Chapter 42-35, specifically Section 42-17.3-2 and the Public Law of Rhode Island, 1978, Chapter 229 and Chapter 46-2.

Attest a true copy.

ENVIRONMENTAL STANDARDS BOARD

17 May 1984  
Date

Joseph E. Cannon  
Joseph E. Cannon, M.D., M.P.H.  
Director of Health

18 May 1984  
Date

Donald Rohrer  
Donald Rohrer  
Director of Administration

May 1984  
Date

Robert L. Bendick, Jr.  
Robert L. Bendick, Jr.  
Director of Environmental Management





STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
75 Davis Street  
Providence, R. I. 02908

17 October 1984

*[Handwritten signature and initials]*

On 15 August 1984, the Rhode Island Department of Environmental Management (DEM) received primacy from the United States Environmental Protection Agency (EPA) to administer an Underground Injection Control (UIC) Program. This places the responsibility and the authority to regulate subsurface discharge of non-domestic wastes with the DEM. In accordance with regulations established by the UIC Program, all users of subsurface disposal systems for the disposal of non-domestic waste must obtain an order of approval from the DEM. Users have one year from the effective date of the Rhode Island Underground Injection Control Rules and Regulations, which is 10 June 1984, to comply.

Orders of approval will be considered for subsurface disposal systems that can be categorized as a Class V well/disposal system as set forth in the Rules and Regulations as follows:

Section 3: Application

- 3.01 These rules apply to injection wells, subsurface disposal systems of a non-domestic nature and multiple dwelling, community or regional system for the injection of domestic wastes. These rules do not apply to injection wells or subsurface disposal systems used to dispose of individual or single family residential domestic waste.
- 3.02 These rules do not apply to the disposal of domestic waste discharged to a subsurface disposal system except in the case of utilization of a well, septic tank or cesspool or any other means which meets the definition of a bored, drilled or driven shaft, or a dug hole, whose depth is greater than the largest surface dimension.

Class V systems include the following:

1. Cesspools or other devices that receive wastes, which have an open bottom and sometimes have perforated sides. (The UIC requirements do not apply to single family residential cesspools.)
2. Dry wells used for the injection of wastes into a subsurface formation.
3. Septic system wells used to inject the waste or effluent from a multiple dwelling, business establishment, community or regional business establishment septic tank; or for a multiple dwelling, community or regional cesspool. (The UIC requirements do not apply to single family waste disposal systems.)
4. Air conditioning return flow wells used to return to the supply aquifer the water used for heating or cooling in a heat pump.
5. Cooling water return flow wells used to inject water previously used for cooling.
6. Drainage wells used to drain surface fluid, primarily storm runoff, into a subsurface formation.
7. Recharge wells used to replenish the water in an aquifer.
8. Salt water intrusion barrier wells used to inject water into a fresh water aquifer to prevent the intrusion of salt water into the fresh water.
9. Sand backfill wells used to inject a mixture of water and sand, mill tailings or other solids into mined out portions of subsurface mines.
10. Subsidence control wells (not used for the purpose of oil or natural gas production) used to inject fluids into a non-oil or gas producing zone to reduce or eliminate subsidence associated with the overdraft of freshwater.
11. Wells used for the storage of hydrocarbons which are gases at standard temperature and pressure.
12. Geothermal wells used in heating and aquaculture.
13. Nuclear disposal wells.

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Subsurface disposal systems that cannot be classified in the categories outlined are prohibited.

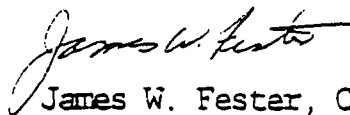
The application process requires the user to complete the enclosed forms and provide information concerning the facility, the disposal system, the waste discharged, and any pertinent historical information. Specific information that is required include the following:

1. A site plan of the facility designating all buildings, property lines, the disposal system, wells on the property and a north arrow.
2. A diagram of the disposal system, indicating piping, junction boxes, tanks, leach fields and wells. The dimensions of all major components must appear on the diagram.
3. The type of waste(s), the concentration of waste(s), and the amount of waste(s) discharged.
4. The date of the disposal system installation, past problems, and changes in the type of waste discharged.

When the above information and the application are received by the DEM, a review of the application will be made by DEM personnel. If necessary, the Department may request additional information or sampling before a decision on an order of approval is finalized.

If you have any questions, please feel free to contact Michael Mulhare at (401) 277-2234.

Sincerely,



James W. Fester, Chief  
Division of Water Resources  
Department of Environmental Management

JWF/MM/nas



U.S. ENVIRONMENTAL PROTECTION AGENCY  
OFFICE OF DRINKING WATER  
**INVENTORY OF INJECTION WELLS**  
(This information is collected under  
the authority of the Safe Drinking Water Act.)

**I. DATE PREPARED**  
(mo., day, & year)

**II. FACILITY I.D. NUMBER**

**III. TRANSACTION TYPE** - ('X' one)

- 1. DELETION
- 2. FIRST TIME ENTRY
- 3. CHANGE OF ENTRY

**IV. FACILITY NAME AND LOCATION**

C	A. NAME										
01											
C	B. STREET ADDRESS OR ROUTE NUMBER										
02											
C	C. CITY OR TOWN				D. ST.	E. ZIP CODE		F. COUNTY		G. INDIAN LAND (mark 'X')	
03											

**V. LEGAL CONTACT: TYPE, NAME, PHONE, MAILING ADDRESS, AND OWNERSHIP**

C	A. TYPE (mark 'X')		B. NAME (last, first, & middle initial)						C. PHONE (area code & no.)			
04	<input type="checkbox"/> 1. OWNER <input type="checkbox"/> 2. OPERATOR											
C	D. ORGANIZATION											
05												
C	E. STREET OR P.O. BOX											
06												
C	F. CITY OR TOWN				G. ST.	H. ZIP CODE		I. OWNERSHIP ('X' one)				
07								<input type="checkbox"/> P. PRIVATE <input type="checkbox"/> M. PUBLIC <input type="checkbox"/> O. OTHER (specify) _____ <input type="checkbox"/> S. STATE <input type="checkbox"/> F. FEDERAL				

**VI. WELL INFORMATION**

WELL OPERATION STATUS:		UC = UNDER CONSTRUCTION		AC = ACTIVE		TA = TEMPORARILY ABANDONED		PA = PERMANENTLY ABANDONED AND APPROVED BY STATE		AN = PERMANENTLY ABANDONED AND NOT APPROVED BY STATE	
C	A. CLASS AND TYPE	B. TOTAL NO. OF WELLS	C. WELL OPERATION STATUS					D. COMMENTS (optional)			
			UC	AC	TA	PA	AN				
08											
09											
10											
11											
12											
13											
14	205										

Section I. Enter date in order of month, day, and year.

Section II. In the first two positions, insert the appropriate U.S. Postal Services State Code. In the remaining positions, insert the appropriate DUNS, GSA, or State Facility Number, preceded by a one position alphabetic identifier:

D - DUNS Number  
G - GSA Number  
S - State Facility Number

Example: A Federal facility (GSA - 123456789) located in Virginia would be entered as: VAG123456789.

Section III. Transaction type.

Deletion: Place an 'X' in this box and enter the Facility ID Number.

First time entry: Place an 'X' in this box and fill in all appropriate information.

Change of entry: Place an 'X' in this box, enter the Facility ID Number, and fill in the information to be changed.

Section IV. Facility Name and Location

Item A: Insert the official or legal name of the facility.

Item B, C, D, and E: Self-Explanatory.

Item F: Insert the numeric county code acquired from the Federal Information Processing Standards Publication (FIPS Pub 6-1) June 15, 1970, prepared by the U.S. Department of Commerce, National Bureau of Standards. For Alaska, use the Census Division Code developed by the U.S. Census Bureau.

Item G: Place an 'X' in the box if the facility is located on an Indian reservation.

Section V. Legal Contact.

Item A: Place an 'X' in the appropriate box to indicate the type of legal contract. For wells operated by a lease, the operator is the legal contact.

Items B, C: Self-Explanatory.

Item D: If the legal contact is an individual, give the name of his/her business organization to expedite mail distribution.

Item E, F, G, and H: Self-Explanatory.

Item I: Place an 'X' in the appropriate box to indicate the type of ownership.

Section VI. Well Information.

Item A: Enter in these two positions the class and type of injection wells to be inventoried at this facility. Use the most pertinent code selected from the list below. For example: 2R for enhanced recovery injection wells and 3M for solution mining wells, etc.

Item B: Enter the total number of injection wells for each specified class/type.

Item C: Insert the number of wells for each class/type under each operation status.

CLASSIFICATIONS AND TYPES OF INJECTION WELLS

WELL CODE CLASS/TYPE	PRIMARY FUNCTION OF INJECTION WELLS	WELL CODE CLASS/TYPE	PRIMARY FUNCTION OF INJECTION WELLS	WELL CODE CLASS/TYPE	PRIMARY FUNCTION OF INJECTION WELLS
Class I	Industrial, Municipal, and Nuclear Storage Wells That Inject Below Deepest Underground Source of Drinking Water.	2X	Other Class II wells	Class V	All Other Wells That Inject into or above an Underground Source of Drinking Water
II	Industrial disposal well	Class III	Special Process Injection Wells	5A	Air conditioning/cooling water return well
1M	Municipal disposal well	3G	In situ gassification wells	5B	Salinity barrier well
1N	Nuclear waste disposal or storage well	3M	Solution mining well	5D	Storm water drainage well
1X	Other Class I wells	3S	Sulfur mining well by Frasch process	5F	Agricultural drainage well
Class II	Oil and Gas Production and Storage Related Injection Wells	3T	Geothermal well	5G	Other drainage wells
2A	Annular injection well	3U	Uranium mining well	5R	Recharge well
2D	Produced fluid disposal well	3X	Other Class III wells	5S	Subsidence control well
2H	Hydrocarbon storage well	Class IV	Hazardous Facility Wells That Inject into or above an Underground Source of Drinking Water	5W	Waste disposal well
2R	Enhanced recovery injection well.	4H	Hazardous facility injection well	5X	Other Class V wells

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS  
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

To the Director of Environmental Management:

Respectfully represents the undersigned, \_\_\_\_\_

Located in the County of \_\_\_\_\_ that (he) (it) desires to adopt a system or means to prevent pollution as defined in Title 46, Chapter 12 of the General Laws of 1956, as amended, and the Underground Water Source Protection Program, Rules and Regulations, effective June 10, 1984 in accordance therewith, which system or means of subsurface discharge and the proposed location thereof are described in the plans accompanying this application which are marked \_\_\_\_\_

and specifications marked \_\_\_\_\_

And this applicant prays that the Director of Environmental Management may enter an order approving the above mentioned system or means of subsurface discharge which the applicant desires to adopt.

Dated this \_\_\_\_\_ day of \_\_\_\_\_ A.D. 19\_\_

(Signature of applicant) \_\_\_\_\_

(Title) \_\_\_\_\_

(Street Address) \_\_\_\_\_

(Town or City) \_\_\_\_\_

(The name and address of the attorney or counsel for said applicant, if any, shall appear upon the application)

(Name) \_\_\_\_\_