State of Rhode Island and Providence Plantations

Department of Environmental Management

Office of Waste Management

Date: 31 March 1993

AS AMENDED
August 1996

Rules and Regulations for the

Investigation and Remediation

of Hazardous Material Releases
Short Title: Remediation Regulations

DEM-DSR-01-93

Index

Section 1	FINDINGS AND POLICY
Section 2	ORGANIZATION AND METHOD OF OPERATIONS
Section 3	DEFINITIONS
Section 4	PROHIBITIONS, MANAGEMENT, INSPECTIONS AND ANALYTICAL METHODS
Section 5	NOTIFICATION
Section 6	EMERGENCY AND SHORT-TERM RESPONSE
Section 7	SITE INVESTIGATION
Section 8	RISK MANAGEMENT
Section 9	REMEDIAL ACTION WORK PLAN
Section 10	REMEDIAL ACTION APPROVALS
Section 11	REMEDIAL ACTION
Section 12	VARIANCES AND EXTENSIONS
Section 13	PENALTIES AND APPEALS

List of Appendices

Appendix A	DEFINITIONS INCORPORATED BY REFERENCE IN THE REMEDIATION REGULATIONS
Appendix B	ANALYTICAL METHODS FOR REPORTING
Appendix C	HAZARDOUS MATERIAL RELEASE NOTIFICATION FORM
Appendix D	METHOD 2 DIRECT EXPOSURE CRITERIA
Appendix E	METHOD 2 LEACHABILITY CRITERIA
Appendix F	METHOD 2 GB GROUNDWATER OBJECTIVES
Appendix G	FORM OF ENVIRONMENTAL LAND USAGE AGREEMENT

1.00 FINDINGS AND POLICY

1.01 **Authority**: Under the authority of the Rhode Island General Laws, Chapter 42-35, Chapter 23-19.1, Chapter 23-19.14, Chapter 42-17.1-2, Chapter 46-12 and Chapter 46-13.1, particularly Sections 23-19.1-6, 23-19.1-10.3, 23-19.1-11.1, 46-12-3, and 46-12-5 of those Laws, the following rules and regulations are promulgated to administer these chapters for the investigation and remediation of contamination resulting from the unpermitted release of hazardous material, and shall be construed to be consistent with other Departmental regulations and the regulations of federal agencies.

1.02 **Legislative Intent and Policy**: The declaration of intent and public policy enumerated by the Legislature in Chapter 23-19.1, Chapter 23-19.14, Chapter 46-12 and Chapter 46-13.1-2, as amended, are hereby adopted as the administrative findings and policy upon which these rules and regulations are based.

These findings recognize and declare that it is the policy of the State not to allow the unpermitted introduction of pollutants into the environment of the State. It is also the policy of the State that the environment shall be restored, to the extent practicable, to a quality consistent with its beneficial uses.

The Department has determined that contaminated sites exist in the State which pose a direct and/or potential threat to human health and the environment. Furthermore, the contamination is often an obstacle to redevelopment due to the liability relating to the contaminated sites as a result of the fact that financial institutions are often cautious or unwilling to lend to businesses who wish to expand at or relocate to areas that have or are suspected to have contamination. The remediation and control of these contaminated sites will clear the way for re-use and redevelopment and will reduce the artificial economic incentive to develop previously undisturbed natural resources.

The purpose of these regulations is to create an integrated program requiring reporting, investigation and remediation of contaminated sites in order to eliminate and/or control threats to human health and the environment in a timely and cost-effective manner. To ensure consistency and certainty in the process, clean up objectives for soil and groundwater have been developed to manage the risks to human health and the environment, and are to be applied in a manner consistent with the current and reasonably expected future use of the contaminated property.

It has been and shall be the policy of the State to require performing parties to investigate, evaluate and remediate both existing and new unpermitted sources of pollutants which will or may likely adversely affect human health or impact the waters, including groundwater, of the State.

1.03 **Functions**: The primary functions of the Department pursuant to these rules and regulations are to regulate the investigation and remediation of contamination resulting from releases

of hazardous materials; the granting, denial, suspension or revocation of approvals and permits for remediation of that contamination; and the granting, denial, suspension, revocation or approval of the plans and specifications for the installation of any equipment for such remediation.

These regulations are intended to minimize environmental hazards resulting from the unpermitted release of hazardous materials. These regulations are not designed to address aesthetic considerations after risk-based remediation is complete. To the extent that nuisance conditions persist after human health and environmental risks have been eliminated, any disputes concerning these nuisance issues will continue to be addressed through other appropriate legal venues.

2.00 ORGANIZATION AND METHOD OF OPERATIONS

2.01 **Organization**: Section 42-17.1-2 of the Rhode Island General Laws (R.I.G.L.), as amended, provides the Director of the Department of Environmental Management with the powers and duties to exercise all functions, powers and duties vested by Chapters 1-22 in Title 46 of the R.I.G.L. and Chapter 19.1 in Title 23 of the R.I.G.L., and requires the Director to issue and enforce such rules, regulations and orders as may be necessary to carry out the duties assigned.

The Director is also charged with the protection of the environment from the effects of improper, inadequate or unsound management of hazardous waste which may pose a threat to public health and safety, and is the trustee for the natural resources of the State.

Section 46-12-3 of the R.I.G.L. empowers the Director to develop comprehensive programs for the prevention, control and abatement of new or existing pollution of the waters of the State and to make, issue, amend and revoke rules and regulations for the prevention, control and abatement of such pollution. Section 46-12-5 prevents the unpermitted or unapproved placement of a pollutant in any location where it may enter the waters of the State and prevents the unpermitted discharge of any pollutant into those waters. Section 46-12-28 includes groundwater as waters of the state and protects groundwater from the unapproved and unpermitted in-ground or surface discharge or disposal of industrial or commercial pollutants.

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 and hazardous waste treatment processes and operations. Section 23-19.1-6 grants the Director the authority to establish rules and regulations to protect the health and safety of the public and the environment from the effects of improper hazardous waste management.

2.02 **Operation and Enforcement:** The Department's Division of Site Remediation or its organizational successor within the Department is the lead State office for reviewing and approving response actions pursuant to these regulations.

When the Division becomes aware of an actual or potential release of hazardous materials, it may inspect and/or investigate the subject area in order to determine its compliance status and the necessity for response actions. For cases which have the potential for a release, such as an abandonment of containers of hazardous materials, the responsible party will be required to properly manage the material in order to eliminate any potential for harm to human health and/or the environment. A jurisdictional release of hazardous materials occurs when analytical results indicate an exceedance of the appropriate reportable concentrations defined in these regulations. Cases posing the potential to release hazardous materials and those consisting of actual releases require notification to the Division by the responsible party within 15 days of their discovery. The Division will attempt to respond in writing within 45 days of the receipt of the notification as to whether additional response actions will be required in accordance with these regulations.

If the Division determines that the reported release requires a response action, the area impacted by the release is considered to constitute a source area of contamination. A site with one or more source areas is considered to be a contaminated site. A contaminated site is the focus of the regulatory framework described in these regulations.

The Division will respond by informing known responsible parties of their obligations under these regulations through the issuance of a Letter of Responsibility. Failure to meet the obligations of these regulations may result in the issuance of enforcement actions including Notices of Violation and Immediate Compliance Orders or the filing of a civil action. These enforcement actions are not exclusive remedies and may also include the assessment of civil administrative penalties or criminal sanctions.

A contaminated site may also be addressed by a voluntary party which otherwise bears no responsibility for the contaminated site, but which may realize some benefit, economic or otherwise, from remediation. Such parties will not proceed under an enforcement mode as described above, but instead may be informed of the necessary procedural steps in order to meet the requirements of these regulations through the issuance of a Voluntary Procedure Letter.

Regardless of whether the contaminated site is addressed through the enforcement or voluntary program, remediation of the contaminated site under these regulations shall be performed with the goal of providing permanent protection to human health and the environment. A release of hazardous material as defined in these regulations may include any mixture of hazardous substances. The Division has facilitated the remedial process by establishing three methods for determining protective remedial objectives for the hazardous substances found to exist in soil and/or groundwater at any given contaminated site. Method 1 is a series of tables establishing conservative risk-based cleanup levels for commonly encountered hazardous substances. Method 2 is a process by which the performing party can supplement or modify the Method 1 clean up levels to reflect site-specific circumstances. Method 3 corresponds to site-specific human health and/or ecological risk assessments

which may be used for assessing baseline risk and subsequently determining appropriate remedial objectives for all impacted media.

Contaminated sites are likely to enter the site management process during a phase of the Site Investigation. The Site Investigation process concludes with the selection of a site remedy or issuance of a Letter of Compliance if remedial action is not necessary. For sites requiring remedial action, the performing party must propose a remedy at the conclusion of the Site Investigation. The Division will approve acceptable remedies through the issuance of a Remedial Decision Letter which will request that the performing party submit for review and approval a Remedial Action Work Plan. The Remedial Action Work Plan will describe the technical details of implementing the remedy. The Division will approve acceptable Remedial Action Work Plans via an Order of Approval for complex site remedies and a Remedial Approval Letter for simple site remedies. At the point in the process when the Division determines that no further action is necessary, the area impacted by the release in question will be determined to be compliant with these regulations and a Letter of Compliance will be issued.

The Department may enter into Settlement Agreements with performing parties to perform response action(s) if the Department determines that the proposed response action(s) are appropriate and entering the agreement is in the public interest. The Department must be a party to any settlement agreement entered under the authority of these regulations.

When the Department enters into a Settlement Agreement, each party's liability for the response actions (including any future liability to the Department, relating to the release or threatened release that is the subject of the agreement) shall be limited as provided in the agreement pursuant to a covenant not to sue. The covenant not to sue may, at the discretion of the Department, be transferred to successors or assigns who are not otherwise found to be a responsible party under these regulations. The covenant not to sue may provide that future liability to the Department of a settling party under the agreement may be limited to the same proportion as that established in the original Settlement Agreement.

Before the finalization of any Settlement Agreement, the Department shall provide an opportunity for public comment for a period of fourteen (14) days after the date of the notice of the proposed agreement. The Department shall consider any written comments, views or allegations relating to the proposed agreement. The proposed agreement shall be considered final when all substantive public comments have been addressed.

2.03 **Severability**: If any provision of these rules and regulations or the application thereof to any person or circumstances is held invalid by a court of competent jurisdiction, the remainder of the rules and regulations shall not be affected thereby. The invalidity of any section or sections or parts of any section or sections shall not affect the validity of the remainder of these rules and regulations.

3.00 DEFINITIONS

3.01 **Active well** shall mean a well equipped and capable of producing potable water which has been used for this purpose within the last 2 years.

3.02 **Aquifer** shall mean a geologic formation, group of formations, or part of a formation capable of yielding a significant amount of groundwater to wells, springs or Surface Water.

3.03 **Asbestos** shall mean any material consisting of the following materials: actinolite, amosite, anthophylite, chrysotile, crocidolite or tremolite.

3.04 **Authorized Representative** shall mean any individual employed by any Person, including all forms of private, governmental and commercial entities included thereunder, in a position to commit the resources of that Person and bind that Person to any responsibilities and/or liabilities set forth under these regulations.

3.05 **Background** shall mean the ambient concentrations of Hazardous Substances present in the environment that have not been influenced by human activities, or the ambient concentrations of Hazardous Substances consistently present in the environment in the vicinity of the Contaminated-Site which are the result of human activities unrelated to Releases at the Contaminated-Site.

3.06 **Bedrock** shall mean the continuous solid rock that underlies gravel, soil or other surficial material, including any fractured zones within said rock.

3.07 **Bona Fide Prospective Purchaser** shall mean an intentional purchaser of a Contaminated-Site, who had documented their intent to purchase the property in writing and who has offered to pay fair market value for the property in the contaminated state. Any former owner, former operator or other Person who is otherwise a Responsible Party or any Person who had more than ten percent (10%) equitable or other legal interest in any property impacted by the Contaminated-Site or any of the operations related to the contamination cannot be considered as a Bona Fide Prospective Purchaser.

3.08 **Carcinogenic Substance** shall mean any substance defined as a carcinogen or suspected carcinogen by federal agencies and for which a quantitative health risk extrapolation is available.

3.09 **CERCLA** shall mean the federal Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986.

3.10 **Container** shall mean any portable device in which a material is stored, transported, treated, disposed of or otherwise handled.

3.11 **Contaminated-Site** shall mean any Source Area or series of Source Areas that have not reached final resolution under the Remediation Regulations. A Contaminated-Site may include unimpacted land between multiple Source Areas in close proximity to one another. A Contaminated-Site shall be considered to be independent of property lines.

3.12 **Department** shall mean the Department of Environmental Management.

3.13 **Direct Exposure Criteria** shall mean the concentrations of Hazardous Substances in soil protective of human health and the environment from exposures including but not limited to ingestion as identified in Table 1 of Rule 8.02.B (Method 1 Soil Objectives) or any other direct exposure criteria approved by the Director pursuant to Rule 8.02.C (Method 2 Soil Objectives) or Rule 8.04 (Method 3 Remedial Objectives) of the Remediation Regulations.

3.14 **Director** shall mean the Director of the Department of Environmental Management, or that Director's designee.

3.15 **Emergency and Short-Term Response Action** shall mean any activities undertaken immediately following the discovery of a Release of Hazardous Material in order to completely or partially contain, clean up or treat the Released material and remove an imminent hazard if it exists.

3.16 **Environmentally Sensitive Area** shall mean any of the following areas:

A. Areas which provide habitat for Federally endangered or threatened species as determined by the U.S. Department of Fish and Wildlife;

B. Areas which provide habitat for State endangered or threatened species as determined by the Department through the Natural Heritage Program;

C. Surface Water classified A, B or C by the Department or Wetlands;

D. Coastal areas designated as Type 1 Conservation Areas or Type 2 Low-Intensity Use by the Rhode Island Coastal Resources Management Council;

E. Tidal waters classified SA by the Department;

F. State parks, management areas, wildlife areas or marine sanctuaries; or

G. Natural areas owned or operated by government agencies or not-for-profit organizations for the purposes of preserving the natural character of the property.

3.17 **Excess Lifetime Cancer Risk** shall mean the estimated probability that an individual's exposure to a substance could result in cancer.

3.18 **Facility** shall mean all contiguous land, structures and other appurtenances and improvements on the land used for treating, storing or disposing of Hazardous Waste.

3.19 **Free Liquid** shall mean Liquid which readily separates from the solid portion of a material under ambient temperature and pressure.

3.20 **GA/GAA Area** shall mean any area having a Groundwater classification of GA or GAA, including GA and GAA non-attainment designations, in accordance with the Groundwater Quality Regulations.

3.21 **GA Groundwater Objectives** shall mean the concentrations of Hazardous Substances in Groundwater protective of human health and the environment which are identified in Table 3 of Rule 8.03.B.i (Method 1 GA Groundwater Objectives) or any other GA Groundwater Objective approved by the Director pursuant to Rule 8.04 (Method 3 Remedial Objectives) of the Remediation Regulations.

3.22 **GA Leachability Criteria** shall mean the concentrations of Hazardous Substances in soil identified in Table 2 of Rule 8.02.B (Method 1 Soil Objectives) or any other GA Leachability Criteria approved by the Director pursuant to Rule 8.02.C (Method 2 Soil Objectives) or Rule 8.04 (Method 3 Remedial Objectives) of the Remediation Regulations.

3.23 **GB Area** shall mean any area having a Groundwater classification of GB, including GB non-attainment designations, in accordance with the Groundwater Quality Regulations.

3.24 **GB Groundwater Objectives** shall mean the concentrations of Hazardous Substances in Groundwater protective of human health and the environment which are identified in Table 4 of Rule 8.03.B.ii (Method 1 GB Groundwater Objectives) or any other GB Groundwater Objective approved by the Director pursuant to Rule 8.03.C (Method 2 GB Groundwater Objectives) or Rule 8.04 (Method 3 Remedial Objectives) of the Remediation Regulations.

3.25 **GB Leachability Criteria** shall mean the concentrations of Hazardous Substances in soil identified in Table 2 of Rule 8.02.B (Method 1 Soil Objectives) or any other GB Leachability Criteria approved by the Director pursuant to Rule 8.02.C (Method 2 Soil Objectives) or Rule 8.04 (Method 3 Remedial Objectives) of the Remediation Regulations.

3.26 **Groundwater** shall mean water found underground which completely fills the open spaces between particles of sand, gravel, clay, silt and Bedrock fractures. The zone of materials filled with groundwater is called the zone of saturation.

3.27 **Hazard Index** shall mean the calculation of the potential for non-cancer health effects as a result of exposure to one or more Hazardous Substances with the same or similar modes of toxic action or toxic endpoints.

3.28 **Hazardous Material** shall mean any material or combination or mixture of materials containing any Hazardous Substance. Hazardous Material does not include Petroleum as defined in these regulations (i.e., virgin petroleum products).

3.29 **Hazardous Substance** shall mean any substance designated as such pursuant to 40 CFR 300.5 (incorporated by reference and attached in Appendix A). Hazardous Substance also include any material that meets the definition of Hazardous Waste. Hazardous Substance shall not include, for the purposes of these regulations, Asbestos or radioactive materials.

3.30 **Hazardous Waste** shall mean any material defined as such waste pursuant to Rule 3.25 of the Rhode Island Rules and Regulations for Hazardous Waste Management.

3.31 **Imminent Hazard** shall mean a Release of Hazardous Material meeting any of the following criteria:

A. The Release poses an immediate and substantial threat or risk of acute or chronic adverse effect on human health;

B. The Release poses a threat or risk of harm which could cause immediate destruction or significant adverse impact on an Environmentally Sensitive Area or the contamination of a wellhead protection area or other drinking water source;

C. The Release poses an immediate threat of fire or explosion. Further factors to consider when evaluating Releases resulting in a threat of fire and explosion shall include:

i. The ignitability of the Hazardous Material, and the mixture resulting from the Release of the Hazardous Material;

ii. The reactivity of the Hazardous Material, and the mixture resulting from the Release of the Hazardous Material;

iii. The potential incompatibility of the Hazardous Material, and the mixture resulting from the Release of the Hazardous Material, with other materials which can reasonably be expected to be stored or handled in the area of the Release; and

iv. The potential impacts of a fire and/or explosion; and

D. The Release may be influenced by site-specific factors which have the potential to lead to an imminent threat to human health or the environment.

3.32 **Impoundment or Surface Impoundment** shall mean a natural topographic depression or 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 Liquids, solids or materials containing free Liquids, and which is not a well. Examples of impoundments include holding, storage, settling and aeration pits, ponds, and lagoons.

3.33 **Incompatible Materials** shall mean materials which are unsuitable for:

A. Placement in a particular device or management at a Contaminated-Site or facility because those materials may cause corrosion or decay of containment materials; or

B. Commingling with another material under uncontrolled conditions because the commingling might produce heat or pressure, fire or explosion, violent reaction, toxic dusts, mists, fumes or gases or flammable fumes or gases.

3.34 **Industrial/Commercial Activity** shall mean any activity related to the commercial production, distribution, manufacture or sale of goods or services, or any other activity which is not a traditional residential activity as defined by this Section including activities related to outdoor recreational areas with restrictions in place to limit potential exposure.

3.35 **Industrial/Commercial Direct Exposure Criteria** shall mean the concentrations identified in the Industrial/Commercial column of Table 1 of Rule 8.02.B (Method 1 Soil Objectives) or any other Industrial/Commercial Direct Exposure Criteria approved by the Director pursuant to Rule 8.02.C (Method 2 Soil Objectives) or Rule 8.04 (Method 3 Remedial Objectives) of the Remediation Regulations.

3.36 **Inorganic Hazardous Substance** shall mean any Hazardous Substance which is not an Organic Hazardous Substance.

3.37 **Leachability Criteria** shall mean the concentrations of Hazardous Substances protective of GA/GAA and GB Areas, as appropriate, and the environment which are identified in Table 2 of Rule 8.02.B (Method 1 Soil Objectives) or any other GA Leachability Criteria approved by the Director pursuant to Rule 8.02.C (Method 2 Soil Objectives) or Rule 8.04 (Method 3 Remedial Objectives) of the Remediation Regulations.

3.38 **Liquid** shall mean any material that expresses as separable Liquid by weight thirty percent (30%) or more of the material when exposed to a vacuum of 3/4 atmosphere for thirty (30) minutes.

3.39 **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, at a minimum, the quantity, composition, type and the origin, routing and destination of Hazardous Waste from the point of generation, to the point of treatment, storage, or disposal.

3.40 **Method 1** shall mean the determination of appropriate soil and groundwater objectives based on the concentrations of Hazardous Substances identified in Table 1 and Table 2 of Rule 8.02.B (Method 1 Soil Objectives) and Table 3 and Table 4 of Rule 8.03.B (Method 1 Groundwater Objectives) of the Remediation Regulations.

3.41 **Method 2** shall mean the determination of appropriate soil and groundwater objectives based on the concentrations of Hazardous Substances developed using site-specific factors in accordance with Rule 8.02.C (Method 2 Soil Objectives) and Rule 8.03.C (Method 2 GB Groundwater Objectives) of the Remediation Regulations.

3.42 **Method 3** shall mean the determination of appropriate remedial objectives based on the concentrations of Hazardous Substances developed in accordance with Rule 8.04 (Method 3 Remedial Objectives) and Rule 8.05 (Ecological Protection) of the Remediation Regulations.

3.43 **Non-Aqueous Phase Liquid (NAPL)** shall mean an organic compound present at a concentration such that it exists as a separate phase in equilibrium with water.

3.44 **Operator** shall mean the Person who is responsible for the operation of the activities at the Contaminated-Site. For the purposes of these regulations, Persons who create or maintain a security interest in land by making loans, administering loans or participating in the financial workout of defaulted loans are not Operators, and such acts of themselves are not considered participation in management of a Contaminated-Site. Activities which are considered appropriate activities of a secured lender include, without limitation:

A. Requiring or conducting site assessments on a Contaminated-Site; and

B. Collecting income and rents from the site to the extent that such funds are not inappropriately diverted from being utilized toward remediation of the Contaminated-Site.

3.45 **Organic Hazardous Substance** shall mean any Hazardous Substance containing the element carbon.

3.46 **Overburden** shall mean the material present in the ground above bedrock.

3.47 **Owner** shall mean the Person who owns the Contaminated-Site or part of the Contaminated-Site.

3.48 **PCB or PCBs** shall mean any chemical substance that is limited to the biphenyl molecule that has been chlorinated to varying degrees or any combination of substances which contains such substance.

3.49 **Performing Party** shall mean any Bona Fide Prospective Purchaser, Responsible Party, voluntary party or any other party conducting an investigation of and/or Remediation at a Contaminated-Site.

3.50 **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.

3.51 **Petroleum** shall mean any virgin petroleum product including the following products:

A. Unused distillate and residual oil including but not limited to gasoline, aviation fuels, kerosene, diesel, and heating oils; and

B. Unused crankcase oil, lubricants, hydraulic oils, penetrant oils, tramp oils, quench oils, and other industrial oils.

3.52 **Public Water Supply System** shall mean a system for the provision to the public of piped water for human consumption, provided such a system has at least fifteen (15) service connections or regularly serves an average of at least twenty-five (25) individuals daily at least sixty (60) days out of the year.

3.53 **RCRA** shall mean the federal Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, as amended.

3.54 **Release** shall be defined by 40 CFR 300.5 (incorporated by reference and attached as Appendix A) for purposes of the Remediation Regulations, but shall exclude any of the following:

A. Any Release from a process, activity or Contaminated-Site allowed under a permit, license or approval by any regulatory process or legal authority;

B. Any Release of Hazardous Materials solely derived from common household materials and occurring at the household; or

C. Any Release that is completely contained within an area or structure designed and engineered to contain such materials.

Release shall also include an actual or potential threat of Release.

Concentrations of PCBs greater than 10 micrograms/100 cm^2, as measured by a standard wipe test, on any surface shall constitute a Release. The Director may determine that an area with PCB contamination at concentrations lower than specified above requires investigation and/or remediation due to site-specific circumstances.

3.55 **Remediation** shall mean the act of implementing, operating and maintaining a Remedy or Remedial Action.

3.56 **Remediation Regulations** shall mean the Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases.

3.57 **Remedy or Remedial Action** shall mean those actions taken to rectify the effects of a Release of Hazardous Material, so that it does not cause a significant risk to present or future public health or welfare, or the environment.

3.58 **Residential Activity** shall mean any activity related to a (1) residence or dwelling, including but not limited to a house, apartment, or condominium, or (2) school, hospital, day care center, playground, or unrestricted outdoor recreational area.

3.59 **Residential Direct Exposure Criteria** shall mean the concentrations identified in the Residential column of Table 1 of Rule 8.02.B (Method 1 Soil Objectives) or any other Residential Direct Exposure Criteria approved by the Director pursuant to Rule 8.02.C (Method 2 Soil Objectives) or Rule 8.04 (Method 3 Remedial Objectives) of the Remediation Regulations.

3.60 **Responsible Party** shall mean any or all of the following Persons:

A. The Owner or Operator of a Vessel, Transport Vehicle, or a Contaminated-Site at which there is a known or suspected Release;

B. Any Person who, at the time of storage or disposal of any Hazardous Material, owned or operated a Contaminated-Site at which there is a known or suspected Release;

C. Any Person who, by contract, agreement, or otherwise, directly or indirectly, arranged for the disposal of Hazardous Material at a Contaminated-Site at which there has been a known or suspected Release;

D. Any Person who accepts or accepted any Hazardous Materials for transport to disposal or treatment facilities or Contaminated-Sites selected by such Person and from which location there is a Release or a threatened Release of Hazardous Materials which causes the incurrence of response costs;

E. Any Person who otherwise caused or is legally responsible for a Release of Hazardous Materials from a Vessel, Transport Vehicle or operation at a Contaminated-Site; and

F. The Person or legal entity controlling a Contaminated-Site, Transport Vehicle, Vessel or activity that contains or led to a known or suspected Release.

Responsible Party shall also mean any and all combinations of the abovementioned Persons.

The following parties are not Responsible Parties and shall not be held liable for costs or damages associated with a Release of Hazardous Materials:

A. Persons otherwise liable who can establish by a preponderance of the evidence that the Release or threat of Release of Hazardous Materials and the damages resulting therefrom were caused solely by an act of God or an act of war;

B. Persons who are defined as Bona Fide Prospective Purchasers of a Contaminated-Site and have entered a settlement agreement with the Department related to the same Contaminated-Site;

C. Persons who are not Operators and who act solely as custodial receivers or who can establish by a preponderance of evidence that they are an innocent landowner and the Release or threat of Release were caused solely by an act or omission of a third party other than an employer or agent of the defendant, or whose act or omission occurs in connection with a contractual relationship, existing directly or indirectly, with the defendant if the defendant establishes:

   i. That it exercised due diligence in the acquisition of the Contaminated-Site at the time of purchase and exercised due care with respect to the Hazardous Material concerned, taking into consideration the characteristics of such Hazardous Material, in light of the facts and circumstances; and

   ii. That it took precautions against foreseeable acts, or omissions of any such third party and the consequences that could foreseeably result from such acts or omissions; and

D. Persons who maintain an indicia of ownership solely to protect a security interest in land and are not Operators.

For the purposes of this definition, a secured lender is not deemed an Owner or an Operator if in order to protect its security interest the secured lender accepts title to a Contaminated-Site through foreclosure, or by accepting the deed to the Contaminated-Site in lieu of foreclosure, and meeting the following requirements:

A. The secured lender can demonstrate that no act of the secured lender or its agent(s), after accepting title, caused or contributed to a Release of Hazardous Materials;

B. The secured lender provides notification, if required, pursuant to Rule 5.01 (Notification of Release) if notification had not previously been provided to the Department;

C. The secured lender does not acquire property which presents an Imminent Hazard, or in the event of discovery of an Imminent Hazard subsequent to foreclosure, the secured lender takes appropriate action pursuant to Section 6 (EMERGENCY AND SHORT-TERM RESPONSE) of the Remediation Regulations to stop, minimize or remove the imminent threat;

D. The secured lender provides the Department and its agents with access to the Contaminated-Site; and

E. The secured lender acts diligently to sell or otherwise divest itself of ownership or possession of the Contaminated-Site in a timely manner. For the first eighteen (18) months after accepting or taking title, the secured lender is presumptively assumed to be actively seeking to divest the property. In this period, it is the burden of the Department to demonstrate that the lender is not pursuing reasonable good faith efforts. For the time period after eighteen (18) months of accepting or taking title, the burden shifts to the secured lender to affirmatively demonstrate that it has undertaken, and continues to undertake, good faith efforts to sell the property.

3.61 **Sediment** shall mean the unconsolidated inorganic and organic material that is suspended in and is being transported by Surface Water, or has settled out of Surface Water.

3.62 **Source Area** shall mean the horizontal and vertical extent of natural or man-made media impacted by a Release of Hazardous Materials or causing a Release of Hazardous Materials at concentrations in excess of the reportable concentrations described in Rule 5.01.B (Reportable Concentrations for Soil) and Rule 5.01.C (Reportable Concentrations for Groundwater), and determined by the Department to pose a potential threat to human health and the environment. For purposes of these regulations, sanitary landfills licensed under the Rules and Regulations for Solid Waste Management Facilities on or after 18 June 1992 are not source areas.

3.63 **Surface Water** shall mean any body of water open to the atmosphere including brooks, streams, rivers, ponds, lakes, bays or Wetlands.

3.64 **Tank** shall mean a stationary device designed to contain an accumulation of Hazardous Material which is constructed primarily of non-earthen materials which provide structural support.

3.65 **Transport Vehicle** shall mean a motor vehicle, trailer or rail car used for the transportation of cargo by any mode. Each cargo-carrying body (trailer, railroad freight car, etc.) is a separate Transport Vehicle.

3.66 **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 Material.

3.67 **Underground Injection Control System** shall mean any active or inactive system or structure used for the subsurface discharge of commercial or industrial wastewater.

3.68 **Vadose Zone** shall mean the full extent of the soil column existing above the elevation of Groundwater for the purposes of the Remediation Regulations.

3.69 **Vessel** shall mean any boat or watercraft whether moved by oars, paddles, sails, or other power mechanism, inboard or outboard, or any other boat or structure floating upon the water whether or not capable of self locomotion, including house boats, barges and similar floating objects.

3.70 **Well** shall mean a bored, drilled, or driven shaft or a dug hole, with a depth that is greater than its largest surface dimension, through which groundwater has flowed, flows, or may flow under natural or induced pressure and that has been modified for purposes of obtaining water.

3.71 **Wellhead Protection Area** shall mean a three-dimensional zone, designated by the Director and delineated pursuant to Section 18 of the Groundwater Quality Regulations, surrounding a well or wellfield supplying a public water supply system, through which water will move toward and reach such well or wellfield.

3.72 **Wetland** shall mean any area that is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas.

3.73 **40 CFR ...** shall mean that section or subsection of the Code of Federal Regulations, Title 40, Protection of Environment, Chapter l, Environmental Protection Agency. References to the Administrator, appearing therein, shall be interpreted as referring to the Director.

4.00 PROHIBITIONS, MANAGEMENT, INSPECTIONS AND ANALYTICAL METHODS

4.01 **Prohibition on Unpermitted Release or Disposal**: No person shall release any hazardous material in any manner which may impact the classification or uses of the land, ground water, or Surface Water without complying with all applicable rules and regulations.

4.02 **Management of Unpermitted Releases**: Any responsible party who discovers or is notified of the potential unpermitted disposal, release or presence of hazardous materials released from, present on, or originating from its operations or property must immediately initiate investigations and actions as specified in Sections 5 (NOTIFICATION) through 11 (REMEDIAL ACTION) of these regulations.

Sites listed on the National Priorities List shall comply with the requirements of the National Contingency Plan (40 CFR Part 300) in lieu of these regulations.

4.03 **Additional Compliance**: Any action taken pursuant to the requirements of these regulations must be done in compliance with all applicable environmental statutes and regulations. Nothing in these regulations shall be construed to limit the authority of the Department to act pursuant to other existing statutes and regulations.

4.04 **Inspections; Right of Entry**: For purposes of enforcement of these regulations, the Director may:

A. Enter any place the Director has reason to believe hazardous materials are generated, used, stored, treated, or disposed of, and which may have contributed to a release;

B. Inspect any place, material, vessel or transport vehicle that the Director has reason to believe is associated with a release of hazardous material;

C. Obtain samples of any material, from any vessel or transport vehicle or place, which the Director has reason to believe was released, is or was contaminated by a release, or is otherwise associated with a release, of hazardous material; and

D. Inspect and copy records, reports, information, or test results kept or maintained at any place, on any vessel or transport vehicle, that the Director has reason to believe is associated with a release of hazardous material.

4.05 **Analytical Methods**: To the extent that laboratory analysis is utilized pursuant to Section 5 (NOTIFICATION), the analytical protocol shall be consistent with the specified methods listed in Appendix B. Equivalent or alternative methods may be used throughout any other phase of the management of a contaminated-site with specific prior written approval from the Director.

5.00 NOTIFICATION

5.01 **Notification of Release**: A responsible party must notify the Department, in writing, of the discovery of any release in accordance with the requirements of this Rule which was not previously reported to the Department by any responsible party. Any release which requires notification pursuant to this Rule must be reported no later than 15 days after the discovery of the release.

A. Exemptions from Notification:

Any release which is solely the result of an underground injection control system or a leaking underground storage tank is exempt from the reporting requirements of the Remediation Regulations.

B. Reportable Concentrations for Soil:

For those concentrations of hazardous substances which are in excess of any of the soil objectives as specified in Tables 1 or 2 of Rule 8.02.B (Method 1 Soil Objectives), as appropriate, or which are not specified in Tables 1 or 2 and are in an amount and concentration which present a significant potential to cause an acute or chronic adverse effect on human health or the environment, the responsible party shall provide notification to the Division of Site Remediation consistent with Rule 5.02 (Contents of Notification), except as otherwise provided in this Rule.

Notification of a release for soil is not required provided that all of the following site conditions are met:

i. The release has impacted an area currently limited to industrial/commercial activity;

ii. The reasonably foreseeable future use of the property impacted by the release is limited to industrial/commercial activity;

iii. The groundwater underlying the site is classified as a GB area;

iv. There are no well head protection areas or active wells known to the performing party or their representatives within 500 feet;

v. The hazardous substances of concern are listed in Table 1 and Table 2, and are at concentrations which are below the industrial/commercial direct exposure criteria, and below the GB leachability criteria as listed in those tables, respectively;

vi. There are no GA/GAA areas within 500 feet of the release;

vii. The abutting properties are used for industrial/commercial activity; and

viii. There is no physical boundary of any wetland or surface water within 500 feet of the release.

C. Reportable Concentrations for Groundwater:

Responsible parties that have had a release which has impacted or threatens to impact groundwater shall notify the Department when:

i. Any hazardous substance in groundwater is at a concentration which exceeds any of the groundwater objectives for the hazardous substance as specified in Tables 3 and 4 of Rule 8.03 (Groundwater Objectives), as appropriate; or

ii. Any hazardous substance in groundwater which is not specified in Tables 3 or 4 is in an amount and concentration which presents a significant potential to cause an acute or chronic adverse effect on human health or the environment; or

iii. A responsible party has reasonable cause to believe that a discharge or release has occurred which may result in an exceedance of any appropriate groundwater objective.

5.02 **Contents of Notification**: For any release of hazardous materials which triggers notification pursuant to Rule 5.01 (Notification of Release), the written notification must include, but not necessarily be limited to, all of the following information (a form is provided in Appendix C which may be used as the notification submittal for all releases except for those releases posing an imminent hazard):

A. The names, addresses and telephone numbers of: the person notifying the Department of the release; the owner(s) and operator(s) of any properties impacted by the release or of the vessel where the release has occurred; any other responsible parties; and the contact person at the impacted area or vessel where the release has occurred;

B. The city/town, street address, legal description (plat and lot) and the general location of the area impacted by the release;

C. The date of and the circumstances leading to and surrounding the discovery of the release;

D. An identification of the hazardous material released, the approximate concentrations of hazardous substances in the released material and the approximate quantity of the hazardous material released;

E. An initial estimate of the source of the release and the extent of contamination resulting from the release;

F. Measures taken or proposed to be taken in response to the release as of the time of notification;

G. Any other relevant information relating to the potential for environmental impacts and other factors evaluated in determining whether or not the release presents an imminent hazard, including but not limited to:

i. A determination as to whether a release of hazardous material has the potential to adversely impact any wetland or surface water; and

ii. A determination as to whether the extent of hazardous material contamination in soil or groundwater is within 500 feet of a surface water or wetland;

H. A determination as to whether the release impacts an area utilized for residential activity, industrial commercial activity, or both;

I. An identification of the underlying groundwater classification, and if the classification is GB, the distance to the nearest GA/GAA area; and

J. An indication of whether a background determination consistent with Rule 8.06 (Background Concentrations for Soil) will be performed and submitted subsequent to notification.

6.00 EMERGENCY AND SHORT-TERM RESPONSE

6.01 **Emergency and Short-Term Response Actions**: The responsible party must immediately notify the Department with the information outlined in Rule 5.02 (Contents of Notification) and take appropriate action to stop or minimize a release of hazardous material posing an imminent hazard and/or any on-going spill of hazardous material at the time of discovery.

All Emergency and Short-Term Response Actions undertaken by the responsible party must be conducted in a manner which is protective of human health and the environment.

No Emergency and Short-Term Response Action undertaken by the responsible party may be conducted in a manner which increases the potential for harm, either short-term or long-term, to human health or the environment.

6.02 **Treatment Actions**: All Emergency and Short-Term Response Actions which include the treatment of hazardous material or of substances contaminated by a release of hazardous material must be approved by the Director prior to initiation.

6.03 **Duration**: The duration of Emergency and Short-Term Response Actions involving the treatment of hazardous material or of substances contaminated by a release of hazardous material will be determined on an incident-specific basis by the Department.

The duration of any portion of an approved Emergency and Short-Term Response Action involving hazardous waste treatment is limited to less than twenty-four (24) hours from the time of discovery of the release.

6.04 **Emergency Permits**: In cases where on-site treatment of hazardous waste is necessary to remove the imminent hazard, and it is anticipated to take longer than twenty-four (24) hours, responsible parties must obtain an Emergency Permit prior to initiating the treatment actions proposed as part of that response.

Emergency Permit applications must include the manner and location of all proposed treatment operations.

Application for an Emergency Permit may be made orally with a written application following no later than forty-eight (48) hours after the discovery of the release.

Emergency Permits may be granted orally with a written permit subsequently issued.

6.05 **Emergency Permit Duration**: Emergency Permits shall not exceed ninety (90) days in duration.

6.06 **Public Notice**: All Emergency Permits will be accompanied by a public notice published in a local newspaper of largest regional circulation. The responsible party will write that notice in a block ad format and be responsible for its publication. A final copy of the public notice must be submitted and approved by the Department prior to publication. The notice must be published within ten (10) days of the release.

The notice shall contain, at a minimum, the following information:

A. The name and address of the responsible party receiving the permit;

B. A brief description of the hazardous wastes involved;

C. A brief description of the treatment action and/or other actions authorized by the permit;

D. The name and address of the permitting agency; and

E. The duration and effective dates of the permit.

6.07 **Cessation Orders**: The Director may order, via an Immediate Compliance Order or Order to Cease and Desist, the immediate cessation of any Emergency and Short-Term Response Action without process if the Director has reason to believe that the termination of that response action is necessary to protect human health or the environment. An order may also

be issued if the Director finds that the responsible party has not complied with the terms and conditions of an Emergency Permit or if the imminent hazard has been removed.

6.08 **Monitoring and Evaluation**: In all cases where an Emergency and Short-Term Response Action is initiated, the responsible party must, throughout the implementation of that action, monitor and evaluate the performance, effectiveness and completeness of the action in abating, preventing or eliminating contamination and, more specifically, the imminent hazard. The Director may require the submittal of progress reports on a specified schedule throughout the Emergency and Short-Term Response Action.

6.09 **Emergency and Short-Term Response Report**: Following the completion of any Emergency and Short-Term Response Action, the responsible party undertaking the action must prepare an Emergency and Short-Term Response Report providing a detailed summary of all investigations and activities taken in response to the release. This report must be submitted to the Department within thirty days of completion of the Emergency and Short-Term Response Action.

The Emergency and Short-Term Response Report must contain, where applicable, at least the following information:

A. The basis for the determination of whether the release presented an imminent hazard;

B. The design specifications of any physical structures built or installed as part of the response;

C. A site plan showing the areal extent of the release and noting all treatment units, pertinent structures, areas, and/or other aspects of the release and Emergency and Short-Term Response Action;

D. Documentation of any off-site migration of released material including notation of any factors, such as weather conditions, which may have caused or aggravated this migration;

E. The locations of all samples, including those from monitoring activities, taken and the results of the analysis of those samples;

F. The manifests, receipts and/or bills of lading for any hazardous material or material contaminated by the release;

G. The nature, concentrations and extent of residual contamination. In cases where the responsible party considers the Emergency and Short-Term Response Action as the final remedy, the responsible party must demonstrate compliance with Section 8 (RISK MANAGEMENT); and

H. In cases where an Emergency Permit was issued, evidence that Public Notice was issued pursuant to the requirements of Rule 6.06 (Public Notice).

6.10 **Certification Requirements**: The Emergency and Short-Term Response Report and all associated progress reports must include the following statements signed by an authorized representative of the party specified:

A. A statement signed by an authorized representative of the person who prepared the Emergency and Short-Term Response Report certifying the accuracy of the information contained in that report to the best of their knowledge.

B. A statement signed by the responsible party responsible for the submittal of the Emergency and Short-Term Response Report certifying that the report is a complete and accurate representation of the circumstances known about the release and the subsequent response activities to the best of their knowledge.

7.00 SITE INVESTIGATION

7.01 **Site Investigation**: The Director may require a performing party for any contaminated-site to conduct, in a specified amount of time, an investigation of the contaminated-site to adequately assess the nature and extent of contamination, and to evaluate and design a proposed remedy. The Director shall base the decision to require the investigation on the available information regarding the mobility, toxicity and volume of the hazardous material released and the resultant potential for harm to human health or the environment.

The Site Investigation must determine the nature and extent of the contaminated-site and the actual and potential impacts of the release. Remedial alternatives shall be considered and data generated during the Site Investigation must be in such a form and substance as to aid in the selection of a remedy for the contaminated-site that is protective of both human health and the environment.

The scope of the Site Investigation shall be tailored to specific conditions and circumstances at the site under investigation using professional judgement. The Remedial Investigation may be conducted in phases which may focus on specific releases, source areas or exposure pathways.

7.02 **Site Investigation Work Plan**: Upon formal written notification from the Department that a Site Investigation is necessary, the performing party may develop, and submit to the Department for review, comment, guidance and approval, a work plan detailing the specific objectives of the Site Investigation, the data that is necessary to meet those objectives, and the methods which will be used to collect that data. Unless otherwise specified by the Director, submittal of the Site Investigation Work Plan is voluntary.

7.03 **Site Investigation Scope**: The Site Investigation Report shall contain the following information on the contaminated-site where the spill or release occurred, as appropriate:

A. A list of specific objectives of the Site Investigation identifying all data collected to completely characterize the contaminated-site, the release, the impacts the release and to select a remedy;

B. All information previously reported in a Notification of Release required by Rule 5.01 (Notification of Release) and an Emergency and Short-Term Response Report required by Rule 6.09 (Emergency and Short-Term Response Report), if applicable. The performing party may elaborate and expand on any and all information found in those reports. The performing party must correct any incorrect information or interpretations contained in those reports prior to their incorporation into the Site Investigation Report;

C. Documentation of any past incidents or releases (fires, spills, explosions, leaks, etc.);

D. A list of past owners and operators at the contaminated-site including their past uses of the property, a sequencing of property transfers and time periods of occupancy to the extent that this information is available;

E. All previously existing environmental information which characterizes the contaminated-site and all information that led to the discovery of a contaminated-site;

F. A description of the current uses and zoning of the contaminated-site including a brief statement on each active operation performed therewith, a description of the processes employed, a list of all wastes generated, a list of all hazardous materials handled, and a statement summarizing any residential activity on the contaminated-site;

G. A locus map showing the location of the contaminated-site using the U.S. Geological Survey 7.5 minute quadrangle map or a copy of a section of that U.S.G.S. map;

H. A site plan, drawn to scale, showing the locations of all buildings, activities and structures on the contaminated-site including, but not limited to:

i. A North arrow;

ii. Wells;

iii. Underground injection control systems, septic tanks, underground storage tanks, piping and other underground structures;

iv. Outdoor hazardous material storage and handling areas, and extent of paved areas;

v. The location of all environmental samples previously taken at the contaminated-site;

vi. All waste management and disposal areas, active and/or historical; and

vii. Property lines;

I. A general characterization of the property surrounding the area affected by the release including, but not limited to:

i. The location and distance to any surface water bodies within five hundred (500) feet of the contaminated-site;

ii. The location and distance to any environmentally sensitive areas within five hundred (500) feet of the contaminated-site;

iii. The actual sources of potable water for all properties immediately abutting the contaminated-site;

iv. The location and distance to all public water supplies which have been active within the previous 2 years and within one (1) mile of the contaminated-site;

v. A determination as to whether the release impacts any off-site area utilized for residential or industrial/commercial property or both; and

vi. A determination of the underlying groundwater classification and if the classification is GB, the distance to the nearest GA/GAA area;

J. Classifications of surface water and ground water at or surrounding the contaminated-site which could be potentially impacted by the release of hazardous materials;

K. A description of the contamination resulting from the release including, but not limited to:

i. Free liquids on the surface;

ii. Concentrations of hazardous substances which can be shown to present an actual or potential threat to human health, including, but not limited to, any concentrations of hazardous substances in excess of any of the remedial

objectives listed in Tables 1 or 2 of Rule 8.02.B (Method 1 Soil Objectives) or Tables 3 or 4 of Rule 8.03.B (Method 1 Groundwater Objectives);

iii. A determination/opinion as to whether the release of hazardous material has the potential to adversely impact an environmentally sensitive area;

iv. Contamination of man-made structures;

v. Odors or stained soil;

vi. Stressed vegetation;

vii. The presence of excavated or stockpiled material and an estimate of its total volume;

viii. Environmental sampling locations, sampling procedures and copies of the results of any analytical testing undertaken at the contaminated-site; and

ix. A list of the hazardous substances at the contaminated-site;

L. The concentration gradients of hazardous substances throughout the contaminated-site for each media impacted by the release of hazardous materials;

M. The methodology and results of any investigation conducted to determine background concentrations of hazardous substances identified at the contaminated-site;

N. A listing and evaluation of the site-specific hydrogeological properties which could influence the migration of hazardous substances throughout and away from the contaminated-site, including but not limited to, where appropriate:

i. The depth to groundwater;

ii. The presence and effects of both the natural and man-made barriers to and conduits for contaminant migration;

iii. A characterization of the bedrock; and

iv. The groundwater contours, flow rates and gradients throughout the contaminated-site;

O. A characterization of the topography and surface water and run-off flow patterns, including the flooding potential, of the contaminated-site;

P. The potential for hazardous substances from the contaminated-site to volatilize and any and all potential impacts of the volatilization to structures within the contaminated-site;

Q. The potential for entrainment of hazardous substances from the contaminated-site by wind or erosion actions;

R. Detailed protocols for all fate and transport models used in the Site Investigation;

S. A complete list of all samples taken, the location of all samples, parameters tested for and analytical methods used during the Site Investigation;

T. Construction plans and development procedures for all monitoring wells. Well construction must be consistent with the requirements of Appendix I of the Groundwater Quality Regulations;

U. Procedures for the handling, storage and disposal of wastes derived from and during the investigation if such procedures deviate from the Department's Guidelines for the Management of Investigation Derived Waste (Policy Memo 95-01);

V. A quality assurance and quality control evaluation summary report for sample handling and analytical procedures, including, but not necessarily limited to, chain-of-custody procedures and sample preservation techniques; and

W. Any other site-specific factor that the Director has reason to believe is necessary to make an accurate decision as to the appropriate remedial action to be taken at the contaminated-site.

7.04 **Development of Remedial Alternatives**: The Site Investigation Report must contain a section proposing remedial alternatives. This section must contain a minimum of two remedial alternatives other than the no action/natural attenuation alternative unless this requirement is waived by the Department. It should be clear in this section which of these alternatives is most preferable. Cost effectiveness of the remedial alternatives may be used to support the selection of the preferred alternative.

All alternatives must be supported by relevant data contained in the Site Investigation Report and consistent with the current and reasonably foreseeable land usage, and documentation of the following:

A. Compliance with Section 8 (RISK MANAGEMENT);

B. Technical feasibility of the preferred remedial alternative;

C. Compliance with State and local laws or other public concerns; and

D. The ability of the performing party to perform the preferred remedial alternative.

7.05 **Certification Requirements**: The Site Investigation Report and all associated progress reports must include the following statements signed by an authorized representative of the party specified:

A. A statement signed by an authorized representative of the person who prepared the Site Investigation Report certifying the completeness and accuracy of the information contained in that report to the best of their knowledge; and

B. A statement signed by the performing party responsible for the submittal of the Site Investigation Report certifying that the report is a complete and accurate representation of the contaminated-site and the release and contains all known facts surrounding the release to the best of their knowledge.

7.06 **Progress Reports**: Unless otherwise specified by the Director, the performing party must during the implementation of the Site Investigation, submit periodic progress reports on the status of the investigation and interim reports on any milestones achieved in the project.

7.07 **Public Notice**: Public Notice is required at two (2) points during the Site Investigation.

A. Prior to the implementation of the Site Investigation field activities, the performing party must notify all abutting property owners and tenants that an investigation is about to occur; and

B. When the Site Investigation is deemed complete, the Department will issue a program letter confirming that the performing party has adequately assessed the nature and extent of contamination at the contaminated-site. Prior to the formal Department approval of the Site Investigation Report (in the form of a Remedial Decision Letter), the performing party must notify all abutting property owners, tenants and community well suppliers associated with any well head protection areas which encircle the contaminated-site that the investigation is complete and provide them with the findings of the investigation and any proposed remedial alternative which includes on-site treatment and/or containment of hazardous materials as part of the final remedy.

7.08 **Site Investigation Report**: A completed Site Investigation Report shall contain all the information set forth in Rules 7.03 (Site Investigation Scope), 7.04 (Development of Remedial Alternatives) and 7.05 (Certification Requirements) as necessary and appropriate to meet the goals of the Site Investigation. The Site Investigation Report must be submitted to the Department for review and approval upon completion. If the Site Investigation Report is deemed unacceptable by the Department, the Department will identify the reasons why the report is unacceptable and direct the performing party to correct the deficiencies.

All sources of information and assumptions presented in the Site Investigation Report and any other report incorporated therein must be properly referenced and documented.

7.09 **Remedy Selection**: Upon completion of the Site Investigation Report the Director shall issue a Remedial Decision Letter, identifying the preferred remedial alternative. All preferred remedial alternatives which include on-site treatment and/or containment of hazardous materials as part of the final contaminated-site remedy shall be subject to public notice as specified in Rule 7.07 (Public Notice), and shall be subject to public review and comment regarding the technical feasibility of such preferred remedial alternative prior to issuance of the Remedial Decision Letter. If none of the proposed remedial alternatives are acceptable, the Director shall require the performing party to consider other remedial alternatives.

The Director's decision regarding the appropriateness of the site remedy shall be based upon the information contained within the decision record for the contaminated-site. The decision record shall include the following:

A. A finalized Site Investigation Report, specifically Rule 7.04 (Development of Remedial Alternatives); and

B. A final response, approved by the Department, to substantive public comments required by Rule 7.07 (Public Notice). If the responses to comment are prepared by the performing party, the responses must be approved by the Department in order for the responses to be considered final.

8.00 RISK MANAGEMENT

8.01 **Remedial Objectives:** The appropriate remedial objectives for all hazardous substances in all impacted media at a contaminated-site shall be consistent with this Rule so as to manage the actual or potential risks to human health and the environment by ensuring that the following requirements are met:

A. The remedial objective for each carcinogenic substance does not exceed a 1×10^{-6} excess lifetime cancer risk level and the cumulative excess lifetime cancer risk posed by the contaminated-site does not exceed 1×10^{-5};

B. The remedial objective for each non-carcinogenic substance does not exceed a hazard index of 1 and the cumulative hazard index posed by the contaminated-site does not exceed 1 for any target organ;

C. The remedial objective will not significantly contribute to adverse effects to any environmentally sensitive areas at or in the vicinity of the contaminated-site;

D. The remedial objective will be protective of the natural resources of the State, including but not limited to groundwater; and

E. The remedial objective shall address the requirements of Rule 8.07 (Upper Concentration Limits).

Specific requirements for the development and application of concentration-based soil and groundwater objectives are presented throughout the remainder of this Section. Concentration-based soil and groundwater objectives may consider background conditions.

8.02 **Soil Objectives:** Unless otherwise specified in these regulations, soil contaminated as a result of a release of hazardous materials shall be remediated in a manner which meets the direct exposure and leachability criterion for each hazardous substance established in Rule 8.02.B (Method 1 Soil Objectives: Tables 1 and 2), Rule 8.02.C (Method 2 Soil Objectives) or Rule 8.04 (Method 3 Remedial Objectives); or the background concentration of the hazardous substance as established by Rule 8.06 (Background Concentrations for Soils). All soil objectives must be consistent with Rule 8.01 (Remedial Objectives) and Rule 8.02.A (General Requirements for Soil Objectives).

A. General Requirements for Soil Objectives:

i. General Requirements for Direct Exposure Criteria:

1. With respect to any hazardous substance in soil at a contaminated-site, the Director may approve the application of a direct exposure criterion provided it is demonstrated to the satisfaction of the Director that the application of such direct exposure criterion at the contaminated-site will be protective of current and reasonably foreseeable future human exposure.

2. Regardless of the method employed for determining the direct exposure criterion, the residential direct exposure criterion shall be applied throughout the vadose zone for each hazardous substance in soil, except as otherwise provided in this Rule.

The industrial/commercial direct exposure criterion may be applied to a depth of at least 2 feet below ground surface for each hazardous substance in soil if all of the following conditions are met:

a. The contaminated-site is currently limited to industrial/commercial activity;

b. Access to the property containing the contaminated-site is limited to individuals working at or temporarily visiting the subject parcel;

c. The current and reasonably foreseeable future human exposure to soils at the contaminated-site is not expected to occur beyond a depth of 2 feet below ground surface; and

d. An environmental land usage restriction consistent with Rule 8.09 (Institutional Controls) is in effect with respect to the property, or to the portion of the property containing the contaminated-site; such an environmental land usage restriction shall ensure that the property or restricted portion thereof is not used for any residential activity in the future and that any future use of the property or restricted portion thereof is limited to industrial/ commercial activity.

ii. General Requirements for Leachability Criteria:

1. With respect to any hazardous substance in soil at a contaminated-site, the Director may approve a leachability criterion provided it is demonstrated to the satisfaction of the Director that the application of such leachability criterion at the contaminated-site is protective of the following:

a. The actual and potential uses of the groundwater at the contaminated-site by ensuring that, at a minimum, the leachability criterion will not contribute to an exceedance of the applicable groundwater objective for the hazardous substance as described in Rule 8.03 (Groundwater Objectives); and

b. Surface water at or in the vicinity of the contaminated-site from potential migration of groundwater.

2. Regardless of the method employed for determining the leachability criterion, the GA leachability criterion shall be applied throughout the vadose zone for each hazardous substance in soil, except as otherwise provided in this Rule.

The GB leachability criterion may be applied throughout the vadose zone for each substance in soil if <u>both</u> of the following conditions are met:

a. The GB groundwater objective is applicable to the groundwater of concern underlying and downgradient of the contaminated-site in accordance with Rule 8.03 (Groundwater Objectives); and

b. The application of the GB leachability criterion will not contribute to actual or potential impacts to surface water and/or sediments as described in the policies and regulations of the Division of Water Resources.

iii. Method Requirements for Soil Objectives:

For each of the hazardous substances at a contaminated-site, the Director shall approve the application of a Method 1 Soil Objective established in Rule 8.02.B (Method 1 Soil Objectives) provided that the application of the Method 1 Soil Objective is consistent with Rule 8.01 (Remedial Objectives), Rule 8.02.A (General Requirements for Soil Objectives) and the objective is specified in Tables 1 and 2, as appropriate.

If no Method 1 Soil Objective has been promulgated for one or more hazardous substances in soil at a contaminated-site, then the following options are available:

1. Method 2 may be used to develop soil objectives for the contaminated-site as described in Rule 8.02.C (Method 2 Soil Objectives). Method 2 Soil Objectives may be used alone or in combination with other Method 1 Soil Objectives. A combined Method 1 and Method 2 approach shall be considered to result in Method 2 Soil Objectives; or

2. Method 3 may be used to develop soil objectives for the contaminated-site as described in Rule 8.04 (Method 3 Remedial Objectives).

If a Method 1 Soil Objective has been promulgated for one or more hazardous substances in soil at a contaminated-site, then the following options are available:

1. The performing party may <u>only</u> propose Method 2 to develop leachability criteria, as described in Rule 8.02.C (Method 2 Soil Objectives). Method 2 Leachability Criteria may be used alone or in combination with other Method 1 Leachability Criteria. A combined Method 1 and Method 2 approach shall be considered to result in Method 2 Soil Objectives; or

2. Method 3 may be used to develop soil objectives for the contaminated-site as described in Rule 8.04 (Method 3 Remedial Objectives).

For hazardous substances in soil that are determined by either the Department or the performing party to have a potential to significantly contribute to adverse effects to any environmentally sensitive area at or in the vicinity of the contaminated-site, a Method 3 Ecological Risk Assessment shall be performed in accordance with Rule 8.05 (Ecological Protection).

iv. Soil Objectives for Total Petroleum Hydrocarbons (TPH):

Although not a single hazardous substance, TPH can be useful as an indicator of potential adverse impacts to human health from a release of hazardous materials. TPH Soil Objectives shall be applied to a contaminated-site for which jurisdiction has been established through the discovery of a release as described in Section 5 (NOTIFICATION). The Department will utilize these objectives for non-virgin petroleum/weathered petroleum situations as they occur at contaminated-sites.

Accordingly, the Department shall require that soil objectives for TPH as described in this Rule be applied to a contaminated-site in conjunction with soil objectives for the hazardous substances established pursuant to this Section. The Director shall approve the application of the functional equivalent of a direct exposure criterion and leachability criterion for TPH provided that the application of the criteria is consistent with Rule 8.01 (Remedial Objectives) and Rule 8.02.A (General Requirements for Soil Objectives). The performing party may apply the soil objectives for TPH described below or may develop soil objectives for TPH under Method 3, as described in Rule 8.04 (Method 3 Remedial Objectives).

1. The following shall be considered the Method 1 Direct Exposure Criteria for TPH, subject to the provided requirements:

   a. The Method 1 Residential TPH Direct Exposure Criterion shall be 500 ppm; or

   b. The Method 1 Residential TPH Direct Exposure Criterion may be 1000 ppm contingent upon field-verification by Department personnel to ensure that short-term risks are managed appropriately prior to approval as a final remedial objective; and

c. The Method 1 Industrial/Commercial TPH Direct Exposure Criterion shall be 2500 ppm.

2. The following shall be considered the Method 1 Leachability Criteria for TPH, subject to the provided requirements:

a. The Method 1 GA TPH Leachability Criterion shall be 500 ppm; or

b. The Method 1 GA TPH Leachability Criterion may be 1000 ppm and may be field-verified at the discretion of the Department to ensure that short-term risks are managed appropriately prior to approval as a final remedial objective; and

c. The Method 1 GB TPH Leachability criterion shall be 2500 ppm.

For clarity, any reference to concentrations of hazardous substances in the following Rules shall be considered by the Department to be in addition to the appropriate concentrations of TPH as described herein: Rule 8.02 (Soil Objectives), Rule 8.04 (Method 3 Remedial Objectives), Rule 8.06 (Background Concentrations for Soils), Rule 8.08.A (Points of Compliance for Soils), Rule 8.09 (Institutional Controls) and Rule 8.10 (Compliance Sampling).

B. Method 1 Soil Objectives:

Unless otherwise prohibited by the Director, the Method 1 Soil Objectives specified in Tables 1 and 2 may be applied to a contaminated-site provided that the conditions set forth in Rule 8.01 (Remedial Objectives) and Rule 8.02.A (General Requirements for Soil Objectives) are met.

i. Method 1 Direct Exposure Criteria:

The Method 1 Direct Exposure Criteria are listed in Table 1.

ii. Method 1 Leachability Criteria:

The Method 1 Leachability Criteria are listed in Table 2.

With respect to the Method 1 Leachability Criteria for inorganic hazardous substances, the performing party shall conduct a laboratory test that demonstrates that the inorganic hazardous substance will not leach to groundwater at levels which exceed the applicable groundwater objective for

the inorganic hazardous substance. Accordingly, the resulting leachate concentration must not exceed the leachability criteria for the associated inorganic hazardous substance listed in Table 2.

The performing party may perform the Synthetic Precipitation Leaching Procedure (SPLP; EPA Method 1312), the Toxicity Characteristic Leaching Procedure (TCLP; EPA Method 1311) or other procedures pre-approved by the Department to estimate potential leaching of inorganic hazardous substances at the contaminated-site.

TABLE 1

DIRECT EXPOSURE CRITERIA

Substance	Residential (mg/kg)	Industrial/Commercial (mg/kg)
Volatile Organics		
Acetone	7,800	10,000
Benzene	2.5	200
Bromodichloromethane	10	92
Bromoform	81	720
Bromomethane	0.8	2900
Carbon tetrachloride	1.5	44
Chlorobenzene	210	10,000
Chloroform	1.2	940
Dibromochloromethane	7.6	68
Dibromochloropropane (DBCP)	0.5	4.1
Dichloroethane (1,1-)	920	10,000
Dichloroethane (1,2-)	0.9	63
Dichloroethene (1,1-)	0.2	9.5
Dichloroethene (cis-1,2-)	630	10,000
Dichloroethene (trans-1,2-)	1,100	10,000
Dichloropropane (1,2)	1.9	84
Ethyl benzene	71	10,000
Ethylene dibromode (EDB)	0.01	0.07
Isopropyl benzene	27	10,000
Methyl ethyl ketone	10,000	10,000
Methyl isobutyl ketone	1200	10,000
Methyl-tert-butyl-ether (MTBE)	390	10,000
Methylene chloride	45	760
Styrene	13	190
Tetrachloroethane,1,1,1,2	2.2	220
Tetrachloroethane,1,1,2,2	1.3	29

TABLE 1

DIRECT EXPOSURE CRITERIA

Substance	Residential (mg/kg)	Industrial/Commercial (mg/kg)
Tetrachloroethylene	12	110
Toluene	190	10,000
Trichloroethane, 1,1,1-	540	10,000
Trichloroethane, 1,1,2-	3.6	100
Trichloroethylene	13	520
Vinyl chloride	0.02	3.0
Xylenes (Total)	110	10,000
Semivolatiles		
Acenaphthene	43	10,000
Acenaphthylene	23	10,000
Anthracene	35	10,000
Benzo(a)anthracene	0.9	7.8
Benzo(a)pyrene[a]	0.4	0.8
Benzo(b)fluoranthene	0.9	7.8
Benzo(g,h,i)perylene	0.8	10,000
Benzo(k)fluoranthene	0.9	78
Biphenyl, 1,1-	0.8	10,000
Bis(2-ethylhexyl)phthalate	46	410
Bis(2-chloroethyl)ether	0.6	5.2
Bis(2-chloroisipropyl)ether	9.1	82
Chloroaniline, 4- (p-)	310	8200
Chlorophenol, 2-	50	10,000
Chrysene	0.4	780
Dibenzo(a,h)anthracene[a]	0.4	0.8
Dichlorobenzene, 1,2- (o-DCB)	510	10,000
Dichlorobenzene, 1,3- (m-DCB)	430	10,000
Dichlorobenzene, 1,4- (p-DCB)	27	240
Dichlorobenzidine, 3,3-	1.4	13

TABLE 1

DIRECT EXPOSURE CRITERIA

Substance	Residential (mg/kg)	Industrial/Commercial (mg/kg)
Dichlorophenol, 2,4-	30	6,100
Diethyl phthalate	340	10,000
Dimethyl phenol, 2,4-	1,400	10,000
Dimethyl phthalate	1900	10,000
Dinitrophenol, 2,4-	160	4,100
Dinitrotoluene, 2,4-	0.9	8.4
Fluoranthene	20	10,000
Fluorene	28	10,000
Hexachlorobenzene	0.4	3.6
Hexachlorobutadiene	8.2	73
Hexachloroethane	46	410
Indeno(1,2,3-cd)pyrene	0.9	7.8
Methyl naphthalene, 2-	123	10,000
Naphthalene	54	10,000
Pentachlorophenol	5.3	48
Phenanthrene	40	10,000
Phenol	6,000	10,000
Pyrene	13	10,000
Trichlorobenzene, 1,2,4-	96	10,000
Trichlorophenol, 2,4,5-	330	10,000
Trichlorophenol, 2,4,6-	58	520
Pesticides/PCBs		
Chlordane	0.5	4.4
Dieldrin	0.04	0.4
Polychlorinated biphenyls (PCBs)[b]	10	10
Inorganics		
Antimony	10	820

TABLE 1

DIRECT EXPOSURE CRITERIA

Substance	Residential (mg/kg)	Industrial/Commercial (mg/kg)
Arsenic[c]	1.7	3.8
Barium	5,500	10,000
Beryllium[c]	0.4	1.3
Cadmium	39	1,000
Chromium III (Trivalent)	1,400	10,000
Chromium VI (Hexavalent)	390	10,000
Copper	3,100	10,000
Cyanide	200	10,000
Lead[d]	150	500
Manganese	390	10,000
Mercury	23	610
Nickel	1,000	10,000
Selenium	390	10,000
Silver	200	10,000
Thallium	5.5	140
Vanadium	550	10,000
Zinc	6,000	10,000

[a] Estimated quantitation limits
[b] Direct exposure criteria for PCBs consistent with the Toxic Substance Control Act (TSCA)
[c] Background Levels of Priority Pollutant Metals In Rhode Island Soils, T. O'Connor, RIDEM
[d] Direct exposure criteria for Lead consistent with the Rhode Island Department of Health Rules and Regulations for Lead Poisoning Prevention [R23-24.6-PB], as amended

TABLE 2

LEACHABILITY CRITERIA

Substance	GA Leachability (mg/kg except as otherwise noted)	GB Leachability (mg/kg)
Volatile Organics		
Benzene	0.2	4.3
Carbon tetrachloride	0.4	5.0
Chlorobenzene	3.2	100
Dichloroethane (1,2-)	0.1	2.3
Dichloroethylene (1,1-)	0.7	0.7
Dichloroethylene (cis-1,2-)	1.7	60
Dichloroethylene (trans-1,2-)	3.3	92
Dichloropropane (1,2)	0.1	70
Ethylbenzene	27	62
Ethylene dibromide (EDB)	5E-04	-
Methyl-tert-butyl-ether (MTBE)	0.9	100
Styrene	2.9	64
Tetrachloroethylene	0.1	4.2
Toluene	32	54
Trichloroethane (1,1,1-)	11	160
Trichloroethane (1,1,2-)	0.1	-
Trichloroethylene	0.2	20
Vinyl chloride	0.3	-
Xylenes	540	-
Semivolatiles		
Benzo(a)pyrene	240	-
Dichlorobenzene (all isomers)	41	-
Diethylhexyl phthalate	120	-

TABLE 2

LEACHABILITY CRITERIA		
Substance	**GA Leachability (mg/kg except as otherwise noted)**	**GB Leachability (mg/kg)**
Naphthalene	0.8	-
Pentachlorophenol	7.1	-
Trichlorobenzene (1,2,4-)	140	-
Pesticides/PCBs		
Chlordane	1.4	-
Polychlorinated biphenyls (PCBs)[a]	10.0	10.0
Substance	**GA Leachability (mg/l)**	
Inorganics		
Antimony (TCLP/SPLP)	0.05	-
Barium (TCLP/SPLP)	23	-
Beryllium (TCLP/SPLP)	0.03	-
Cadmium (TCLP/SPLP)	0.03	-
Chromium (TCLP/SPLP)	1.1	-
Cyanide (TCLP/SPLP)	2.4	-
Lead (TCLP/SPLP)	0.04	-
Mercury (TCLP/SPLP)	0.02	-
Nickel (TCLP/SPLP)	1	-
Selenium (TCLP/SPLP)	0.6	-
Thallium (TCLP/SPLP)	0.005	-

"-" No Method 1 GB Leachability Criteria promulgated

[a] Leachability criteria for PCBs consistent with the Toxic Substance Control Act (TSCA)

C. Method 2 Soil Objectives:

Method 2 allows for the consideration of limited site-specific information to modify Method 1 Soil Objectives or to calculate soil objectives for hazardous substances not listed in Table 1 or Table 2. For the purposes of these regulations, a Method 2 Soil Objective shall refer to any soil objective which addresses site-specific conditions established pursuant to this Rule and in accordance with the appropriate information presented in Appendix D and Appendix E.

The Department reserves the right to require the development of Method 2 Soil Objectives based on complicated conditions at a contaminated-site, including, but not limited to potential adverse impacts to adjacent surface water bodies or other potential impacts to human health and/or the environment.

Method 2 Soil Objectives shall be consistent with Rule 8.01 (Remedial Objectives), Rule 8.02.A (General Requirements for Soil Objectives) and shall meet all of the following conditions in Rules 8.02.C.i through iv listed below:

i. Direct exposure criteria shall only be developed under Method 2 for those hazardous substances which are not specified under Method 1 in Table 1. Method 2 Direct Exposure Criteria shall be developed using the default assumptions provided in Appendix D. The chemical-specific inputs used to develop the Method 2 Direct Exposure Criteria are subject to the approval of the Director for each proposed application;

ii. Method 2 Soil Objectives shall be developed for hazardous substances on the basis of the following assumptions and procedures:

1. Based upon non-cancer health risk, a concentration of the hazardous substance associated with 100% of the Reference Dose shall be calculated consistent with residential or industrial/commercial activity as appropriate pursuant to Rule 8.02 A.i (General Requirements for Direct Exposure Criteria) using the algorithm specific to the ingestion pathway provided in Appendix D. For a contaminated-site which impacts one or more properties utilized for any residential activity, a concentration of the hazardous substance associated with acute ingestion and the inhalation pathway shall also be calculated using the appropriate algorithms in Appendix D;

2. A concentration of the hazardous substance associated with an Excess Lifetime Cancer Risk equal to no more than one excess cancer case in one million people exposed to the hazardous substance shall be calculated consistent with residential or industrial/commercial activity as appropriate pursuant to Rule 8.02.A.i (General

Requirements for Direct Exposure Criteria) using the algorithm specific to the ingestion pathway provided in Appendix D. For a contaminated-site which impacts one or more properties utilized for any residential activity, a concentration of the hazardous substance associated with the inhalation pathway shall be calculated using the appropriate algorithm in Appendix D;

3. For a contaminated-site impacting one or more properties utilized for any residential activity, the soil saturation concentration (Csat) of the hazardous substance above which pure liquid-phase contaminant is expected in the vadose zone shall be calculated using the equation provided in Appendix D and appropriate chemical-specific and/or soil specific data collected from the contaminated-site;

4. For each concentration of hazardous substance calculated consistent with residential or industrial/commercial activity as appropriate pursuant to Rule 8.02.A.i (General Requirements for Direct Exposure Criteria), the lowest non-zero concentration estimated in Rule 8.02.C.ii.1 through 3 above shall be the Method 2 Direct Exposure Criterion for the hazardous substance;

5. Considering the groundwater classification at the contaminated-site, the Method 2 Leachability Criterion shall be developed utilizing a Department-approved leaching model or test method which demonstrates that the concentrations of the hazardous substance in soil at a contaminated-site now and in the reasonably foreseeable future will result in compliance with all applicable groundwater objectives for that hazardous substance. Therefore, the Department shall approve the target groundwater objective for each hazardous substance established in accordance with this Section prior to the development of the associated Method 2 Leachability Criterion.

   Specifically, Method 2 Leachability Criteria shall be determined by performing the following:

   a. Method 2 Leachability Criteria for Organic Hazardous Substances:

      The performing party may provide a leaching-to-groundwater compliance demonstration with a Department-approved fate and transport model such as that discussed in Appendix E which incorporates site-specific information such as physical and chemical properties of the hazardous substances including, but not limited to toxicity and mobility, source

quantity, subsurface hydrogeological conditions and net precipitation; and

b. Method 2 Leachability Criteria for Inorganic Hazardous Substances:

The performing party shall conduct a laboratory test consistent with that described in Rule 8.02.B.ii (Method 1 Leachability Criteria). The performing party may develop a Method 2 Leachability Criterion for an inorganic hazardous substance by calculating a site-specific dilution/attenuation factor using the algorithm in Appendix E to be multiplied by the appropriate groundwater objective;

6. A site-specific background concentration of the hazardous substance in soil may be calculated and considered for the hazardous substance pursuant to Rule 8.06 (Background Concentrations for Soils); and

7. The Practical Quantitation Limit (PQL) of the hazardous substance using an appropriate analytical method for quantifying the concentration of the chemical in soil may be calculated and considered;

iii. If the development of a Method 2 Soil Objective results in a concentration of a hazardous substance which exceeds any Upper Concentration Limit as described in Rule 8.07 (Upper Concentration Limits), then the Department reserves the right to require that the modification be adjusted downward to a concentration which prevents the exceedance; and

iv. The development of Method 2 Soil Objectives shall be based upon information which is scientifically justified and completely documented with site data collected from the contaminated-site. At a minimum, Method 2 Soil Objective development shall be documented with sufficient information to allow the Director to evaluate the following factors:

1. The appropriateness and validity of any chemical-specific and/or site-specific input parameters used;

2. Whether the calculations were correctly performed;

3. The potential for soils at the contaminated-site to pose a significant risk to human health and the environment after the proposed Method 2 Soil Objectives are applied to the contaminated-site as part of a remedial action; and

4. Background levels for the applicable hazardous substances, if determined.

8.03 **Groundwater Objectives:** Unless otherwise specified in these regulations or otherwise provided by the Director, groundwater contaminated as a result of a release of hazardous materials located in a GA/GAA area shall be remediated to a concentration which meets the groundwater objective for each hazardous substance established in Rule 8.03.B.i (Method 1 GA Groundwater Objectives) and specified in Table 3 or Rule 8.04 (Method 3 Remedial Objectives); or the background concentration of the hazardous substance. Any Method 3 GA Groundwater Objective which deviates from the Method 1 GA Groundwater Objective shall meet the requirements of Rule 13.04 of the Groundwater Quality Regulations.

Groundwater contaminated as a result of a release of hazardous materials located in a GB area shall be remediated to a concentration which meets the groundwater objective for each hazardous substance established in Rule 8.03.B.ii (Method 1 GB Groundwater Objectives) and specified in Table 4, Rule 8.03.C (Method 2 GB Groundwater Objectives) or Rule 8.04 (Method 3 Remedial Objectives); or the background concentration of the hazardous substance.

All groundwater objectives must be consistent with Rule 8.01 (Remedial Objectives) and Rule 8.03.A (General Requirements for Groundwater Objectives).

A. General Requirements for Groundwater Objectives:

i. General Requirements for GA Groundwater Objectives:

1. GA Groundwater Objectives may not be set at levels, except within an approved discharge zone or residual zone (as provided for in Rules 13.03 and 13.04, respectively, of the Groundwater Quality Regulations) which will adversely affect the groundwater as a source of potable water or which will adversely affect other beneficial uses of groundwater, including but not to be limited to recreational, agricultural and industrial uses and the preservation of fish and wildlife habitat through the maintenance of surface water quality; and

2. GA Groundwater Objectives may not be set at levels which exceed or have reasonable potential to cause exceedance of surface water quality standards established by the Rhode Island Water Quality Regulations for Water Pollution Control, October 1988, and amendments thereto.

ii. General Requirements for GB Groundwater Objectives:

The GB Groundwater Objectives shall be applied in the restoration of the State's groundwater resources which are not for use as current or potential sources of drinking water. GB Groundwater Objectives shall be based on the potential for volatile organic compounds found or suspected in GB areas to volatilize from the groundwater and migrate to indoor air. These GB Groundwater Objectives are based on controlling the threat to human health from the inhalation of these hazardous substances.

The GB Groundwater Objectives shall be applied to the restoration of groundwater in GB Areas under the control of the performing party, provided that the Department determines that the following conditions apply to the contaminated groundwater:

1. The extent and nature of the groundwater contamination does not pose a substantial likelihood of exceeding a surrounding GA Groundwater Objective;

2. The extent and nature of the groundwater contamination does not pose a substantial likelihood of adversely affecting current uses of groundwater, surface water resources or surrounding properties as they exist at the time that the site investigation work is conducted (i.e., adverse off-site impacts are eliminated or effectively mitigated);

3. The groundwater of concern is not located in a designated buffer zone around a licensed solid waste management facility and specific exceedances are acknowledged as part of the operating permit; and

4. The groundwater of concern does not pose a significant threat to the classification and/or actual and potential uses of the surface water bodies in the vicinity of the contaminated-site consistent with the policies and regulations of the Division of Water Resources, or to human health and the environment.

iii. Method Requirements for Groundwater Objectives:

1. Method Requirements for GA Groundwater Objectives:

For each of the hazardous substances at a contaminated-site, the Director shall approve the application of a Method 1 GA Groundwater Objective established in Rule 8.03.B.i (Method 1 GA Groundwater Objectives) provided that the application of the Method

1 GA Groundwater Objective is consistent with Rule 8.01 (Remedial Objectives), Rule 8.03.A (General Requirements for Groundwater Objectives) and the objective is specified in Table 3.

The performing party may develop groundwater objectives under Method 3, as described in Rule 8.04 (Method 3 Remedial Objectives). Groundwater objectives developed using Method 3 may be used alone or in combination with other Method 1 Groundwater Objectives. A combined Method 1 and Method 3 approach shall be considered to result in Method 3 GA Groundwater Objectives.

2. Method Requirements for GB Groundwater Objectives:

For each of the hazardous substances at the contaminated-site, the Director shall approve the application of a Method 1 GB Groundwater Objective established in Rule 8.03.B.ii (Method 1 GB Groundwater Objectives) provided that the Method 1 GB Groundwater Objective is consistent with Rule 8.01 (Remedial Objectives), Rule 8.03.A (General Requirements for Groundwater Objectives) and the objective is specified in Table 4.

The following options are also available to the performing party with respect to GB Groundwater Objective development:

a. Method 2 may be used to develop groundwater objectives for the contaminated-site as described in Rule 8.03.C (Method 2 GB Groundwater Objectives). Method 2 GB Groundwater Objectives may be used alone or in combination with Method 1 GB Groundwater Objectives. A combined Method 1 and Method 2 approach shall be considered to result in Method 2 GB Groundwater Objectives;

b. Method 3 may be used to develop groundwater objectives for the contaminated-site as described in Rule 8.04 (Method 3 Remedial Objectives); or

c. The Method 1 GA Groundwater Objectives as specified in Table 3 may be used for those hazardous substances not included in Table 4.

For hazardous substances in groundwater that are determined by either the Department or the performing party to significantly contribute to adverse effects to any environmentally sensitive area at or in the vicinity of the contaminated-site, a Method 3 Ecological

Risk Assessment shall be performed in accordance with Rule 8.05 (Ecological Protection).

B. Method 1 Groundwater Objectives:

Unless otherwise prohibited by the Director, the Method 1 Groundwater Objectives may be applied to a contaminated-site provided that the conditions set forth in Rule 8.01 (Remedial Objectives) and Rule 8.03.A (General Requirements for Groundwater Objectives) are met.

i. Method 1 GA Groundwater Objectives:

Groundwater which is classified as a GA/GAA area is categorized as or presumed to be suitable for drinking water use without treatment, and is subject to the GA Groundwater Objectives listed in Table 3.

ii. Method 1 GB Groundwater Objectives:

Groundwater which is classified as a GB area is presumed not suitable for use as a current or potential source of drinking water, and is subject to the GB Groundwater Objectives listed in Table 4.

TABLE 3

GA GROUNDWATER OBJECTIVES

Substance	GA Groundwater Objective (mg/l)
Volatile Organics	
Benzene	0.005
Carbon tetrachloride	0.005
Chlorobenzene	0.1
Dibromomchloropropane(DBCP)	0.0002
Dichloroethane (1,2-)	0.005
Dichloroethylene (1,1-)	0.007
Dichloroethylene (cis-1,2-)	0.07
Dichloroethylene (trans-1,2-)	0.1
Dichloropropane (1,2-)	0.005
Ethylbenzene	0.7
Ethylene dibromide (EDB)	0.00005
Methyl tertiary butyl ether (MTBE)	0.04
Styrene	0.1
Tetrachloroethylene	0.005
Toluene	1
Trichloroethane (1,1,1-)	0.2
Trichloroethane (1,1,2-)	0.005
Trichloroethylene (TCE)	0.005
Trihalomethanes (Total)	0.1
Vinyl chloride	0.002
Xylenes (Total)	10
Semivolatiles	

TABLE 3

GA GROUNDWATER OBJECTIVES

Substance	GA Groundwater Objective (mg/l)
Benzo(a)pyrene	0.0002
Dichlorobenzene (o-)	0.6
Dichlorobenzene (m-)	0.6
Dichlorobenzene (p-)	0.075
Diethylhexyl phthalate	0.006
Hexachlorobenzene	0.001
Methylene chloride	0.005
Naphthalene	0.02
Pentachlorophenol	0.001
Trichlorobenzene (1,2,4-)	0.07
Pesticides/PCBs	
Chlordane	0.002
Polychlorinated biphenyls (PCBs)	0.0005
Inorganics	
Antimony	0.006
Barium	2
Beryllium	0.004
Cadmium	0.005
Chromium (Total)	0.1
Cyanide	0.2
Lead	0.015
Mercury	0.002
Nickel	0.1
Selenium	0.05

TABLE 3

GA GROUNDWATER OBJECTIVES

Substance	GA Groundwater Objective (mg/l)
Thallium	0.002

TABLE 4

GB GROUNDWATER OBJECTIVES

Substance	GB Groundwater Objective (mg/l)
Benzene	0.14
Carbon Tetrachloride	0.07
Chlorobenzene	3.2
Dibromochloropropane (DBCP)	0.002
Dichloroethane (1,2-)	0.11
Dichloroethylene (1,1-)	0.007
Dichloroethylene (cis-1,2-)	2.4
Dichloroethylene (trans-1,2-)	2.8
Dichloropropane (1,2-)	3.0
Ethylbenzene	1.6
Styrene	2.2
Methyl Tertiary Butyl Ether (MTBE)	5.0
Tetrachloroethylene	0.15
Toluene	1.7
Trichloroethane (1,1,1-)	3.1
Trichloroethylene	0.54

C. Method 2 GB Groundwater Objectives:

Method 2 allows for the consideration of limited site-specific information to modify Method 1 GB Groundwater Objectives or to calculate GB Groundwater Objectives for hazardous substances in groundwater not listed in Table 4, but which have the potential to volatilize. For the purposes of these regulations, a Method 2 GB Groundwater Objective shall refer to any groundwater objective which has addressed

site-specific conditions pursuant to this Rule and in accordance with the appropriate information presented in Appendix F.
The Department reserves the right to require the development of Method 2 GB Groundwater Objectives based on complicated conditions at the contaminated-site such as potential adverse impacts to adjacent surface water bodies, potential adverse impacts to surrounding GA/GAA areas or other potential impacts to human health and/or the environment.

Method 2 GB Groundwater Objectives may be developed for hazardous substances which do not have promulgated Method 1 GB Groundwater Objectives listed in Table 4, or when conditions at the contaminated-site deviate significantly from the conservative assumptions used to calculate the Method 1 GB Groundwater Objectives as discussed in Appendix F, provided that the resulting Method 2 GB Groundwater Objective is based on detailed site-specific information.

Method 2 GB Groundwater Objectives shall be consistent with Rule 8.01 (Remedial Objectives) and Rule 8.03.A (General Requirements for Groundwater Objectives) and shall meet all of the following conditions in Rules 8.03.C.i through iv listed below:

i. The Method 2 GB Groundwater Objective shall be based, at a minimum, on the following:

    1. A scientifically acceptable volatilization model such as that described in Appendix F; or

    2. Transport and fate modeling that incorporates site-specific information on the hazardous substances, hydrogeological conditions at the contaminated-site, current and reasonably foreseeable building conditions, and which demonstrates that contamination will not infiltrate to indoor air and result in significant risk of harm to human health or the environment; and/or

    3. Soil gas characterization data, indoor air characterization data, and data resulting from field investigation activities conducted at and proximate to the contaminated-site;

ii. The Method 2 GB Groundwater Objectives shall not result in indoor or ambient air concentrations which pose a significant risk of harm to human health or the environment;

iii. If the development of a Method 2 GB Groundwater Objective results in a concentration of a hazardous substance which exceeds any Upper Concentration Limit as described in Rule 8.07 (Upper Concentration Limits),

then the Department reserves the right to require that the modification be adjusted downward to a concentration which prevents the exceedance; and

iv. Method 2 GB Groundwater Objectives shall be scientifically justified and sufficiently documented to demonstrate that the developed objectives are protective against migration of hazardous substances into indoor air or any other site-specific considerations. At a minimum, Method 2 GB Groundwater Objective development shall be documented with sufficient information to allow the Director to evaluate the following:

1. The appropriateness and validity of any chemical-specific and/or site-specific input parameters used;

2. Whether the calculations, modeling or sampling were correctly performed;

3. The potential for groundwater at the contaminated-site to pose significant risk to human health and the environment after the proposed Method 2 GB Groundwater Objectives are applied to the contaminated-site as part of a remedial action; and

4. Background levels for the applicable hazardous substances, if determined.

8.04 **Method 3 Remedial Objectives:** Method 3 Remedial Objectives allow for a site-specific risk assessment to be conducted by the performing party on either a voluntary basis, or as required by the Director, subject to requirements of Rule 8.01 (Remedial Objectives), and to the extent appropriate to Rule 8.02.A (General Requirements for Soil Objectives) and Rule 8.03.A (General Requirements for Groundwater Objectives).

Site-specific human health risk assessments shall be conducted only after review and approval of a Human Health Risk Assessment Workplan by the Department. The methodology proposed in the Human Health Risk Assessment Workplan must be consistent with scientifically acceptable risk assessment practices and the fundamentals of risk assessment under EPA's Risk Assessment Guidance for Superfund. The Human Health Risk Assessment Report, when completed according to the approved workplan, shall propose remedial objectives for all impacted environmental media, as appropriate.

In addition, in reviewing the site-specific Method 3 Remedial Objectives derived pursuant to this Rule, the Director may evaluate the following factors:

A. The potential for any remaining hazardous substances to pose a significant threat to human health or the environment;
B. Correct application of the approved methodology;

C. The management of risk relative to any remaining contamination;

D. Background levels for the applicable hazardous substances; and

E. Circumstances related to the practicality of remediation.

Method 3 Remedial Objectives shall also be utilized to develop remedial objectives which are protective of environmentally sensitive areas. To the extent that remedial objectives protective of environmentally sensitive areas are required by the Director, the performing party must develop such remedial objectives in accordance with Rule 8.05 (Ecological Protection).

If any Method 3 Remedial Objective results in an exceedance of any Upper Concentration Limit as described in Rule 8.07 (Upper Concentration Limits), then the Department reserves the right to require that the Method 3 Remedial Objective be adjusted downward to a concentration which prevents the exceedance.

8.05 **Ecological Protection:** Based on information provided in the Notification, Site Investigation or any other source, if a release of hazardous materials has the potential to adversely impact an environmentally sensitive area, then the Director may require the following, including but not limited to:

A. An Ecological Risk Assessment, conducted in accordance with EPA/630/R-92/001, February 1992, Framework for Ecological Risk Assessment, or functional equivalent. The Ecological Risk Assessment shall be conducted only after Department review and approval of an Ecological Risk Assessment Workplan; and

B. An Ecological Risk Assessment Report, which proposes remedial objectives demonstrated to mitigate any risks to the impacted media identified in the Ecological Risk Assessment. Soil objectives which result from the Ecological Risk Assessment Report shall be considered Method 3 Soil Objectives.

8.06 **Background Concentrations for Soil:**

A. Sampling of hazardous substances in background areas may be conducted to distinguish concentrations related to the contaminated-site from concentrations of hazardous substances not related to activities at the contaminated-site or to support the development of soil objectives under the provisions of Rule 8.02 (Soil Objectives).

B. For purposes of defining background concentrations, samples shall be collected from areas that have the same characteristics as the soil at the contaminated-site, and meet the definition of background.

C. In order to evaluate or justify available data for the purposes of defining background concentrations, a performing party shall use a statistical method which is appropriate for the distribution of each hazardous substance and such method shall utilize a minimum of twenty samples. If the distribution of the hazardous substance data is inappropriate for statistical methods based on a normal distribution, then the data may be transformed. If the distributions of individual hazardous substances differ, more than one statistical method may be required at a contaminated-site.

D. For purposes of estimating background concentrations, values below the method detection limit shall be assigned a value equal to one-half of the method detection limit. Measurements above the method detection limit, but below the practical quantitation limit shall be assigned a value equal to the method detection limit. The Department may approve the use of alternate statistical procedures for handling data below the method detection limit or practical quantitation limit.

8.07 **Upper Concentration Limits:** Upper Concentration Limits in soil and groundwater are concentrations of hazardous substances which, if exceeded, may demarcate a transition between contaminated environmental media and waste in the environment. Upper Concentration Limits are not applicable to soil which has been immobilized or encapsulated as part of an approved remedial response action.

All remedial objectives shall address the following concentrations or conditions:

A. The presence of non-aqueous phase liquids (NAPL) in any environmental medium shall be considered a condition which exceeds Upper Concentration Limits;

B. The Upper Concentration Limit for TPH in soil is 30,000 ppm;

C. The Upper Concentration Limit for any hazardous substance in soil is 10,000 ppm; and

D. Table 5 lists the Upper Concentration Limits in GB groundwater which are protective against potential explosive conditions due to the volatilization of hazardous substances in groundwater to structures where human exposures cannot be reasonably expected to occur (see Appendix F).

TABLE 5

UPPER CONCENTRATION LIMITS FOR GB GROUNDWATER

Substance	GB Groundwater UCL (mg/l)
Benzene	18
Dichloroethane (1,2-)	670
Dichloroethene (1,1-)	23
Dichloroethene (cis-1,2-)	69
Dichloroethene (trans-1,2-)	79
Dichloropropane (1,2-)	140
Ethyl Benzene	16
Styrene	50
Toluene	21
Trichloroethane (1,1,1-)	68
Trichloroethylene	87

8.08 **Points of Compliance:**

A. Points of Compliance for Soils:

i. The points of compliance for soils are points where the soil objectives established under Rule 8.02 (Soil Objectives) or Rule 8.04 (Method 3 Remedial Objectives) shall be attained. For soil objectives based on direct exposure to humans engaged in residential or industrial/commercial activities, the point of compliance shall be established in the soils throughout the contaminated-site, except as otherwise specified in Rule 8.02.A.i (General Requirements for Direct Exposure Criteria). For soil objectives based on protection of GA/GAA or GB areas, the points of compliance shall be established throughout the contaminated-site in a manner consistent with Rule 8.02.A.ii (General Requirements for Leachability Criteria).

ii. For a contiguous volume of contaminated soil which is determined to pose risks associated with direct exposure to humans engaged in residential and industrial/commercial activities, separate and distinct points of compliance

may be proposed, provided that such points of compliance are consistent with Rule 8.02.A.i (General Requirements for Direct Exposure Criteria) and are demonstrated to ensure protection of both residential and industrial/commercial activities. Such points of compliance are subject to the approval of the Director.

The performing party shall take affirmative steps to manage the contaminated-site such that the contaminated-site does not impact property which is not within the control of performing party, by ensuring that, at a minimum, the following requirements are met:

1. The concentration of any hazardous substance in soil does not exceed the Method 1 Residential Direct Exposure Criterion as described in Rule 8.02 (Soils Objectives) and as specified in Table 1 at any point beyond the control of the performing party;

2. The direct exposure criteria which is applied to the full areal extent which is under the control of the performing party does not present threats to human health and the environment at any point within that control pursuant to Rule 8.01 (Remedial Objectives), Rule 8.02 (Soil Objectives) or Rule 8.04 (Method 3 Remedial Objectives) as appropriate; and

3. The performing party shall provide formal written documentation to the Department demonstrating the performing party's control over the full areal extent of the Method 1 Residential Direct Exposure Criterion exceedance including, but not limited to the following, as appropriate:

    a. Documented acceptance of any residential direct exposure criterion developed pursuant to Rule 8.04 (Method 3 Remedial Objectives) and all supporting documentation used in their derivation from all landowners whose property is impacted by the release; and

    b. An environmental land usage agreement entered into by all impacted land owners pursuant to Rule 8.09 (Institutional Controls), if the exposure assumptions made in the development of the Method 3 Remedial Objective are such that they need to be institutionally maintained in order to guarantee long-term protection of human health and the environment.

iii. For a contaminated-site which is determined to actually or potentially impact GA/GAA and GB areas, separate and distinct points of compliance for soils may be proposed, provided that such points of compliance are consistent with Rule 8.02.A.ii (General Requirements for Leachability Criteria) and are demonstrated to ensure compliance with both GA and GB Groundwater Objectives.

iv. Points of compliance for soils based on impacts to environmentally sensitive areas shall be established throughout the contaminated-site or as determined in the ecological risk assessment performed in accordance with Rule 8.05 (Ecological Protection).

B. Points of Compliance for Groundwater:

i. Points of Compliance with the GA Groundwater Objectives:

Any point where the groundwater quality is monitored or where groundwater is withdrawn for use, excepting points within a discharge zone or residual zone approved pursuant to Section 13 of the Groundwater Quality Regulations, may be used to determine compliance with the groundwater objectives for the area. Points of compliance with GA Groundwater Objectives may be on, or in close downgradient proximity to, the contaminated-site.

ii. Points of Compliance with the GB Groundwater Objectives:

1. Points of compliance with GB Groundwater Objectives shall be established at locations which provide ample warning prior to groundwater flow into, under and around structures. Specifically:

a. Points of compliance with the GB Groundwater Objectives shall be established along a line situated approximately 30 feet (or any other appropriate and hydrologically defensible distance approved by the Director) laterally from any facility structure boundary, including, but not limited to utility conduits and structures such as sewer lines and pump houses;

b. These points of compliance shall be situated along this line in a manner consistent with the groundwater flow direction;

c. The spacing between points of compliance on the line will depend on site-specific information such as size of the structure, and must be managed in such a way as to provide

sufficient information regarding any potential impacts from contaminated groundwater volatilizing to indoor air;

d. These points of compliance may be in addition to points of compliance designated for source control activities; and

e. The Department reserves the right to require additional or separate points of compliance based on site-specific circumstances;

2. The performing party shall take affirmative steps to eliminate migration of any hazardous substance in groundwater to a GB area which is not under the control of the performing party, by ensuring that, at a minimum, the following requirements are met:

a. The concentration of the hazardous substance in groundwater does not exceed the Method 1 GB Groundwater Objective as specified in Table 4 at any point beyond the control of the performing party; and

b. The GB Groundwater Objective which is applied to the full areal extent which is under the control of the performing party does not present threats to human health and the environment at any point within that control pursuant to Rule 8.01 (Remedial Objectives), Rule 8.03.A (General Requirements for Groundwater Objectives), 8.03.C (Method 2 GB Groundwater Objectives) or Rule 8.04 (Method 3 Remedial Objectives) as appropriate;

3. The performing party shall provide formal written documentation to the Department demonstrating the performing party's control over the full areal extent of the Method 1 GB Groundwater Objective exceedance including, but not limited to the following, as appropriate:

a. Documented acceptance of the GB Groundwater Objectives and all supporting documentation used in their derivation from all landowners whose property is impacted by the release; and

b. An environmental land usage agreement entered into by all impacted land owners pursuant to Rule 8.09 (Institutional Controls), if the exposure assumptions made in the development of the GB Groundwater Objectives are such that

they need to be institutionally maintained in order to guarantee long-term protection of human health and the environment.

4. Points of compliance for groundwater based on impacts to environmentally sensitive areas shall be established throughout the contaminated-site or as determined in the ecological risk assessment performed in accordance with Rule 8.05 (Ecological Protection).

8.09 **Institutional Controls:** Performing parties must institute environmental land usage restrictions for all properties subject to final decisions which result in levels of hazardous substances greater than those protective against direct exposure associated with residential land usage; or are subject to final decisions under a variance pursuant to Rule 12.03 (Variances) relating to a remedial objective pursuant to these regulations; or are subject to any final decisions based solely or in part on the limitation of reasonably foreseeable exposures to hazardous substances in any media.

The owner(s) of the contaminated-site shall document their concurrence with this restriction by entering an Environmental Land Usage Agreement with the Department. The standard format for this agreement is provided in Appendix G. The executed Environmental Land Usage Agreement shall run with the land, as recorded on the title(s) to the property (or properties) on which the contaminated-site is situated, and shall be binding on all owners, successors and/or assigns. This agreement, and the associated restrictions and controls shall be subject to approval by the Director and shall include provisions to accomplish all of the following:

A. Prohibit activities on the contaminated-site that may interfere with a remedial action and its operation and maintenance, long-term monitoring or other measures necessary to assure the integrity of the remedial action;

B. Prohibit activities that may result in human exposure to levels of hazardous substances which exceed the concentrations that have been determined to be protective of human health, or that may result in a release of hazardous materials which was contained as part of the remediation;

C. Require prior notice to the Department of the owner's intent to convey any interest in the contaminated-site. A conveyance of title, an easement, or other interest in the property or portion of the property shall not be consummated by the owner without complete and full disclosure of the plans and procedures, and adequate and complete provision for the continued operation of the remedy and the prevention of releases and exposures as described in Rule 8.09.B;

D. Grant to the Department and its designated representatives the right to enter the property at reasonable times for the purpose of monitoring compliance with the remedial action; and

E. Describe the restrictions placed on the property and/or the allowable uses of the property.

A copy of the final, recorded notice must be submitted to the Department within fifteen (15) days of the date that it is entered into the Land Evidence Records.

8.10 **Compliance Sampling:**

A contaminated-site is considered by the Director to be compliant with the Remediation Regulations when it is demonstrated that the appropriate remedial objectives have been met at all source areas within the contaminated-site. This Rule specifies procedures for determining compliance with the appropriate soil objectives and groundwater objectives applied to the contaminated-site. Compliance procedures with all other remedial objectives shall be determined on a site-specific basis.

A. Compliance with the Soil Objectives:

All performing parties have, unless otherwise specified by the Director, two alternatives for determining compliance with soil objectives. These alternatives are:

i. A performing party may propose in the Remedial Action Work Plan to verify compliance by taking less than twenty samples for laboratory analysis. This must be accomplished by a representative sampling program used to characterize the distribution and concentration of hazardous substances at the former source area. The analytical results of all samples taken using this approach, including any and all specific samples which may be specified and/or taken by the Department, must be below the appropriate soil objective in order for the source area to be considered compliant with these Regulations; or

ii. A performing party may propose in the Remedial Action Work Plan to verify compliance by geometrically griding the former source area and taking not less than twenty compliance samples for laboratory analysis at the intersecting points of the grid. If a performing party utilizes this criteria they may also propose a statistical analysis methodology for determining compliance. This methodology must meet the following criteria:

1. No single sample result exceeds the soil objective by a factor of 5;

2. No more than 10% of the individual sample results exceed the soil objective; and

3. No single sample result exceeds any Upper Concentration Limit as defined by Rule 8.07 (Upper Concentration Limits).

B. Compliance with the Groundwater Objectives:

Compliance with the groundwater objectives shall be determined through laboratory analysis of representative samples used to characterize the distribution and concentration of hazardous substances migrating from the contaminated-site. The analytical results of all samples taken using this approach must be below the appropriate groundwater objective in order for the contaminated-site to be considered compliant with these Regulations.

8.11 **Remedial Objective Approvals:** All remedial objectives must be approved by the Department at one of two points in the site management process. These are:

A. Rule 7.04 (Development of Remedial Alternatives); or

B. Rule 9.02 (Remedial Objectives).

9.00 REMEDIAL ACTION WORK PLAN

9.01 **Remedial Action Work Plan**: The performing party for a contaminated-site where remedial action is found to be necessary under these regulations must prepare and submit to the Department for review and approval a Remedial Action Work Plan documenting how the proposed remedial action will be implemented. The Director shall base the decision to require remedial action on the information available on the mobility, toxicity and volume of the hazardous material released and the resulting potential for harm to human health and the environment.

The performing party may prepare and submit a limited Remedial Action Work Plan for interim or partial remedial actions. Limited or partial Remedial Action Work Plans must contain appropriate assurances that a more complete scope of activities will be evaluated as the contaminated-site is investigated and characterized.

9.02 **Remedial Objectives**: The Remedial Action Work Plan must present a remedial action which addresses remedial objectives for all impacted media at the contaminated-site in a manner consistent with Section 8 (RISK MANAGEMENT), including, as appropriate, the following:

A. Groundwater Objectives: The performing party must propose a remedial objective for all hazardous substances found to have actual or potential impacts on groundwater.

B. Surface Water and Sediment Objectives: The performing party must propose a remedial objective for all hazardous substances found to have actual or potential impacts on surface water and/or sediments, that is consistent with the actual and potential uses of the surface water and/or sediment in the impacted area, and the policies and regulations of the Division of Water Resources;

C. Soil Objectives: The performing party must propose a remedial objective for all hazardous substances and TPH found to have actual or potential impacts on soil, that is consistent with the actual and potential uses of the land in the impacted area. The remedial objective for soil must also take into account the potential for the hazardous substances to leach into groundwater and/or surface water from these impacted soils and, subsequently, should be consistent with the actual and potential uses of the ground water and/or surface water in the impacted area and the policies and regulations of the appropriate regulatory authority for that resource; and

D. Air Objectives: The performing party must propose a remedial objective for all hazardous substances found to have actual or potential impacts on air quality, whether the impact is from gaseous or particulate emissions and/or entrainment on soil. That air objective must be consistent with the requirements of the Rhode Island Clean Air Act and the rules and regulations promulgated pursuant thereto.

The remedial objectives for each media should be expressed, wherever possible or appropriate, as a residual concentration of hazardous material or hazardous substance. However, for remedial actions which include no action/natural attenuation or combinations of engineering and institutional controls which involve containment of contaminated media, the Remedial Action Work Plan shall demonstrate that the proposed remedial action will address the remedial objectives for all impacted media at the contaminated-site in a manner consistent with Rule 8.01 (Remedial Objectives). Department approval of this demonstration shall serve as the Remedial Objective Approval pursuant to Rule 8.11 (Remedial Objective Approvals). This demonstration may be in addition to the documentation of compliance with Section 8 (RISK MANAGEMENT) required by Rule 7.04 (Development of Remedial Alternatives).

The remedial objectives must also consider and manage any short-term risks to human health and the environment associated with the remedial action implementation.
The performing party must estimate the time period necessary to meet all appropriate remedial objectives for groundwater, surface water, sediment, soil and air. In every case, a remedial action should be designed, whenever practicable, as a permanent solution to meet the remedial objectives for hazardous substances in all affected media in the shortest time frame feasible.

9.03 **Proposed Remedy**: The Remedial Action Work Plan must clearly explain the proposed remedy and justify the ability of the remedy to meet the remedial objectives. For Remedial Action Work Plans that include on-site treatment and/or containment of contaminated media, the performing party must demonstrate that best management practices will be followed to:

A. Prevent the infiltration/migration of hazardous substances at levels harmful to human health or the environment;

B. Prevent direct contact with hazardous substances at levels harmful to human health and the environment;

C. Eliminate volatilization and entrainment of hazardous substances; and

D. Minimize and manage surface runoff from the area including during the remedial action.

9.04 **Remediation of Impacted Groundwater**: The Remedial Action Work Plan must clearly explain how impacted groundwater will be remediated. Remediation of groundwater must meet the requirements of Section 16 of the Groundwater Quality Regulations, as well as the requirements of Section 8 (RISK MANAGEMENT) of the Remediation Regulations. Any Remedial Action Work Plan which includes the proposal of a discharge zone and/or a residual zone must submit the required proposals and meet the required demonstrations of Rules 13.03 and 13.04 of the Groundwater Quality Regulations, respectively.

9.05 **Limited Design Investigation**: The Director may require the performing party to include a proposed Limited Design Investigation in the Remedial Action Work Plan in order to gather information necessary for the design and construction of a specific remedy. The performing party may also propose to include a Limited Design Investigation in the Remedial Action Work Plan in order to gather information necessary for the design and construction of a specific remedy. Activities proposed as part of this Limited Design Investigation must meet the requirements of Section 7 (SITE INVESTIGATION) of these regulations.

9.06 **Points of Compliance**: The Remedial Action Work Plan must clearly indicate the locations, for each impacted medium where hazardous substances will be measured in order to determine if the remedial objectives have been met. These points will be designated Points of Compliance. Remedial actions will be initially focussed on meeting remedial objectives set for the contaminated-site, and compliance must be measured throughout that contaminated-site. The Points of Compliance must be managed in a manner consistent with Rule 8.08 (Points of Compliance).

9.07 **Proposed Schedule for Remediation**: The Remedial Action Work Plan must include a proposed schedule for implementing the proposed remedial action.

9.08 **Contractors and/or Consultants**: The performing party must include the names, addresses and telephone numbers of the contact persons of any contractors or consultants hired to implement or operate the remedy proposed in the Remedial Action Work Plan. The responsibilities of each consultant and/or contractor must be clearly explained. If the actual consultant or contractor has not been determined at the time of application, the expected duties of each company must be explained and the Department must be notified as soon as the specific companies are selected.

9.09 **Site Plan**: The Remedial Action Work Plan must include a site plan. The site plan submitted as part of the Site Investigation, conducted pursuant to Rule 7.03.F, must be amended to include any further information available to the performing party, and the locations of all proposed remedial units and monitoring points. The Points of Compliance must also be clearly marked on the site plan.

9.10 **Design Standards and Technical Specification**: The Remedial Action Work Plan must include all design standards and technical specifications necessary for the design of the proposed remedy. Design standards and technical specifications will include, where appropriate:

A. Identification of the materials of construction of all portions of the remedy;

B. The type of equipment to be used, including unit capacity and dimensions;

C. The results of any laboratory or pilot-scale tests conducted to determine the effectiveness of the proposed remedial action; and

D. Any manufacturer's literature and/or technical guidance documents on the construction, implementation and/or operation of proposed units.

These portions of the Remedial Action Work Plan must be prepared under the supervision of a Registered Professional Engineer in the State of Rhode Island, and stamped by that engineer prior to submittal.

9.11 **Set-up Plans**: The Remedial Action Work Plan must explain any pre-operational staging or construction requirements which must be completed prior to the installation and operation of the proposed remedial actions. These pre-operational staging or construction activities may include the installation of pads, liners, or berms; any intrusive activities; or any contaminated-site contouring or grading which may be necessary. The Set-Up Plan must show how any construction or staging activities will be done in a manner in compliance with any applicable laws, rules and regulations.

9.12 **Effluent Disposal**: The Remedial Action Work Plan must include specific plans for the management and disposal of any products or by-products from the proposed remedial action.

This section must also identify what regulations must be complied with during, and what permits or approvals must be obtained prior to, any planned effluent disposal actions.

9.13 **Contingency Plan**: The Remedial Action Work Plan must include a Contingency Plan which clearly explains the procedures to be followed and the persons to be notified in the event of an unexpected incident involving hazardous materials at the contaminated-site. The Contingency Plan must include, at a minimum, the following information:

A. The names and telephone numbers of all emergency coordinators;

B. All emergency response procedures and arrangements; and

C. A description of the procedures necessary for the prevention of ignition and/or reaction of any flammable material or reactive materials, where appropriate.

The Contingency Plan must be available at the contaminated-site at all times during the implementation and operation of the remedial action.

9.14 **Operating Log**: The Remedial Action Work Plan must include a proposed Operating Log which clearly and completely records activities on-site and shows how the implementation and operation of the remedial action is progressing. This Operating Log must include, at a minimum, the following information:

A. Time periods of operation of the remedial unit and approximate flow rates;

B. Records of any analyses conducted as part of the remedial action;

C. Instances of implementation of the Contingency Plan; and

D. An inspection plan designed to insure the proper operation of the proposed remedial unit. Operating treatment units must be inspected at least weekly unless an alternative inspection frequency is approved by the Director.

Documentation of these inspections and any problems found and/or repairs made must be included.

The Operating Log must be readily available at the contaminated-site during implementation and operation of the remedial action. A copy of this log must be submitted to the Department annually unless an alternative submittal frequency is approved by the Director for the duration of the active operation of the treatment unit.

The Operating Log must be kept for at least three (3) years following completion of the remedial action.

9.15 **Security Procedures**: The Remedial Action Work Plan must include a description of the security procedures proposed to prevent unknowing access to the contaminated-site or key features identified at the contaminated-site. This section must include descriptions of any natural boundaries or any existing or proposed walls or fences surrounding the contaminated-site. Means to control entry to the contaminated-site or key features identified at the contaminated-site must also be clearly explained.

9.16 **Shut-Down, Closure and Post-Closure Requirements**: The Remedial Action Work Plan must contain a section outlining the procedures required to shut-down and close the remedial units. This section must also outline any proposed post-closure activities, including monitoring and/or institutional controls restricting future land usage at the contaminated-site. All post-closure groundwater monitoring must be done in accordance with a program meeting the requirements of Section 12 of the Groundwater Quality Regulations.

9.17 **Institutional Controls and Notices**: The Remedial Action Work Plan must indicate a methodology for providing notice to the general community, and contain specific plans and implementation procedures for land usage restrictions, restrictions on the use of groundwater on the contaminated-site, and institutional controls in accordance with Rule 8.09 (Institutional Controls) for all remedial actions that are not determined by the Director to provide a permanent solution.

9.18 **Compliance Determination:** The Remedial Action Work Plan must include a section outlining the procedures to be employed in order to demonstrate that the remedial objectives for the contaminated-site have been met. Such compliance determination must be proposed in a manner consistent with Rule 8.10 (Compliance Sampling).

9.19 **Certification Requirements**: The Remedial Action Work Plan and all associated progress reports must include the following statements signed by an authorized representative of the party specified:

A. A statement signed by an authorized representative of the person who prepared the Remedial Action Work Plan certifying the accuracy of the information contained in that report to the best of their knowledge; and

B. A statement signed by an authorized representative of the performing party responsible for the submittal of the Remedial Action Work Plan certifying that the report is a complete and accurate representation of the contaminated-site and the release and contains all known facts surrounding the release to the best of their knowledge.

10.00 REMEDIAL ACTION APPROVALS

10.01 **Remedial Action Approvals**: The performing party must receive approval of the Remedial Action Work Plan from the Director prior to initiating any activities contained therein.

Remedial Action Approvals which include the treatment of hazardous waste at the contaminated-site will be in the form of a Temporary Remedial Action Permit subject to the requirements and conditions of R.I.G.L. 23-19.1-10.3, Emergency and Temporary Permits. The performing party must have a Temporary Remedial Action Permit throughout the period that hazardous waste is being treated.

Approvals for remedial actions which include the remediation of impacted groundwater in GA/GAA areas to remedial objectives other than those listed in Table 3 of Rule 8.03.B.i (Method 1 GA Groundwater Objectives) must obtain a Groundwater Quality Certification pursuant to the requirements of Section 17 of the Groundwater Quality Regulations.

The Director may issue conditions to the Remedial Action Approval when the Director finds that those conditions are necessary to protect human health and the environment. Conditions may include, but not necessarily be limited to, requirements that the performing party provide financial assurances that the remedial action will continue.

10.02 **Remedial Action Approval Application Fees**: The application fee for Remedial Action Approvals shall be one thousand ($1,000.00) dollars.

10.03 **Change in Ownership, Administration and/or Location**:

A. At least thirty (30) days prior to any change in ownership of the contaminated-site or a change in operator of the Remedial Action, the performing party must notify the Director of the proposed change.

B. Remedial Action Approvals shall be voidable whenever there is a change in ownership of the contaminated-site or a change in operator of the Remedial Action.

10.04 **Remedial Action Approval Modifications**: The performing party must apply to the Director for approval of any modifications that the performing party finds necessary during the design, construction or implementation of the remedy.
The Director may require modification of a permit or approval if there is reason to believe that the remedy is not working as anticipated.

The Director may require a new Remedial Action Work Plan in cases where the Director determines that the proposed modifications substantially alter any process or the results of the remedy.

10.05 **Revocation or Suspension of Permits and Approvals**: The Director may order the immediate cessation of any remedial action whenever the Director determines that a performing party is not in compliance with all of the appropriate rules and regulations

established by the Department, or that the performing party is not performing the remedial action in conformance with approved plans or conditions of a permit or approval.

The Director may, in lieu of revocation or suspension of the permit or approval issued to the performing party, order that performing party to take whatever corrective action is needed to secure compliance with the rules and regulations established by the Department.

11.00 REMEDIAL ACTION

11.01 **Operational Requirements**: These rules apply to all performing parties conducting any remedial action activities.

11.02 **Proper Operation and Maintenance**: The performing party must operate and maintain all portions, activities and/or operations in accordance with all the terms and conditions of its Remedial Action Approval, and all other applicable laws and regulations. The Department must be notified in writing immediately if the performing party suspects or has reason to believe that any of the remedial objectives will not be met.

11.03 **Operating Records**: The performing party must maintain an operating log as specified in Rule 9.14 (Operating Log) or as otherwise specified by the Director in the Remedial Action Approval.

11.04 **Personnel Training**: The performing party must maintain a personnel training program as specified in the Remedial Action Approval.

11.05 **Progress Reports**: The performing party must submit progress reports at least quarterly. The reports must clearly explain all activities specified in the Remedial Action Approval which have been initiated or which have been completed.

Progress reports must also include the results of all sampling and analysis conducted at the contaminated-site.

After completion of the remedial action, the results of all post-closure monitoring must be submitted to the Director.

11.06 **Effluent Disposal**: The performing party must dispose of all treated effluent, products and/or byproducts from the proposed remedial action in the manner specified in the Remedial Action Approval and in compliance with any other applicable rules and regulations.

11.07 **Initiator**: The performing party must comply with all applicable Rules of Section 5.00 of the Rules and Regulations for Hazardous Waste Management, as amended, for all hazardous waste shipments that they initiate.

The performing party must comply with the requirements of the Rules and Regulations for Solid Waste Management Facilities, as amended, for all solid waste shipments that they initiate.

11.08 **Security**: The performing party must maintain a contaminated-site security program equivalent to that specified in the Remedial Action Approval.

11.09 **Closure and Post Closure**: The performing party must close the remedial action and maintain all post-closure requirements as specified in the Remedial Action Approval.

12.00 VARIANCES AND EXTENSIONS

12.01 **Applications**: An applicant may apply to the Director for a variance from or extension to any of these rules and regulations. The Director may require the collection and/or submission of information the Director deems necessary to fully evaluate such application.

12.02 **Extensions**: The Director may upon request, issue an extension to any of the time tables and schedules required by these regulations in the form of a variance.

12.03 **Variances**: The Director may upon application, issue a variance under this rule when compliance with these rules and regulations would cause unreasonable or undue hardship to the applicant, provided the applicant can also present substantial evidence that the issuance of a variance will, at a minimum:

A. provide protection to human health and the environment equivalent to that which is provided by these regulations;

B. not result in exceedances of applicable remedial objectives as described in Section 8 (RISK MANAGEMENT) beyond the control of the performing party;

C. not endanger the public health and safety;

D. not significantly interfere with the public use and enjoyment of any recreational resource;

E. not significantly adversely impact any surface water or any groundwater, or cause contamination of any drinking water supply or tributary thereto; and

F. not violate any provisions of any pertinent federal or state statutes, rules or regulations regarding air, land or water resources.

In determining whether the applicant has met these requirements, the Director may consider background conditions. Other conditions which the Director will take into consideration

when evaluating a request for a variance will include, but not be limited to, groundwater classification, contaminant migration pathways, mobility and toxicity of constituents of concern, volume of contamination, institutional controls and the resulting risk to human health and the environment.

The Director reserves the right to limit the effective time period for a variance.

12.04 **Department's Evidence**: The Department, through its authorized agents, may present evidence to the Director relative to any application or request for an extension or variance.

12.05 **Remonstrant**: Remonstrants who have been notified, as required by this rule, may present evidence to the Director relative to any application or request for an extension or variance it submits for approval or modification.

12.06 **Decision**: The Director may grant or deny the variance after hearing provided, however, that the variance may be subject to such terms and conditions as the Director may deem necessary to protect the public health and safety, and the environment.

13.00 PENALTIES AND APPEALS

13.01 **Penalties**: Administrative penalties may be assessed for any violation of these regulations and will be calculated based on the methodology specified in the Department of Environmental Management Rules and Regulations for the Assessment of Administrative Penalties.

13.02 **Appeals**: Any person affected by a decision of the Director pursuant to these regulations may, in accordance with the Administrative Rules of Practice and Procedure for the Department of Environmental Management, file a claim for an adjudicatory hearing to review the decision. The party appealing a Department decision bears the burden of proving that they comply with the requirements of the rules and regulations herein and that the denial by the Department was arbitrary and capricious or characterized by an abuse of discretion.

The foregoing "Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases, as amended August 1996" after due notice and hearing are hereby adopted and filed with the Secretary of State, this _15_th day of August 1996 to become effective twenty (20) days thereafter, in accordance with the provisions of Chapters 42-17.1-2, 42-35, 23-19.1, 23-19.14, 46-12 and 46-13.1 of the General Laws of Rhode Island, 1956, as amended.

_____

Timothy R. E. Keeney, Director
Department of Environmental Management

Notice Given on: 21 June 1996

Public Hearing Held: 22 July 1996

Filing Date: 15 August 1996

Effective Date: 4 September 1996

Appendix A
DEFINITIONS INCORPORATED BY REFERENCE IN THE REMEDIATION REGULATIONS

National Contingency Plan

40 CFR 300.5; Definitions:

"Hazardous substance" as defined by section 101(14) of CERCLA, means: Any substance designated pursuant to section 311(b)(2)(A) of the CWA; any element, compound, mixture, solution, or substance designated pursuant to section 102 of CERCLA; any hazardous waste having the characteristics identified under or listed pursuant to section 3001 of the Solid Waste Disposal Act (but not including any waste the regulation of which under the Solid Waste Disposal Act has been suspended by Act of Congress); any toxic pollutant listed under section 307(a) of the CWA; any hazardous air pollutant listed under section 112 of the Clean Air Act; and any imminently hazardous chemical substance or mixture with respect to which the EPA Administrator has taken action pursuant to section 7 of the Toxic Substances Control Act. The term does not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically listed or designated as a hazardous substance in the first sentence of this paragraph, and the term does not include natural gas, natural gas liquids, liquified natural gas, or synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas).

"Release" as defined by section 101(22) of CERCLA, means any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles containing any hazardous substance or pollutant or contaminant), but excludes: Any release which results in exposure to persons solely within a workplace, with respect to a claim which such persons may assert against the employer of such persons; emissions from the engine exhaust of a motor vehicle, rolling stock, aircraft, vessel, or pipeline pumping station engine; release of source, byproduct, or special nuclear material from a nuclear incident, as those terms are defined in the Atomic Energy Act of 1954, if such release is subject to requirements with respect to financial protection established by the Nuclear Regulatory Commission under section 170 of such Act, or, for the purposes of section 104 of CERCLA or any other response action, any release of source, byproduct, or special nuclear material from any processing site designated under section 102(a)(1) or 302(a) of the Uranium Mill Tailings Radiation Control Act of 1978; and the normal application of fertilizer. For purposes of the NCP, release also means threat of release.

Appendix B
ANALYTICAL METHODS FOR REPORTING

Volatile Organic Compounds - EPA Method 8240 and 8260

Semi-Volatile Organic Compounds - EPA Method 8270

PCB/Pesticides - EPA Method 8080

Inorganics - Compound Specific Applicable EPA Method

Compound	EPA Method
Antimony	6010, 6020, 7040, 7041, 7062
Arsenic	6010, 6020, 7060, 7061, 7062, 7063
Beryllium	6010, 6020, 7090, 7091
Cadmium	6010, 6020, 7130, 7131
Chromium III	Subtract Chromium VI from Total Chromium
Chromium VI	7195, 7196, 7197, 7198, 7199
Total Chromium	6010, 6020, 7190, 7191
Copper	6010, 6020, 7210, 7211
Cyanide	9010, 9012, 9013, 9213
Lead	6010, 6020, 7420, 7421
Manganese	6010, 6020, 7460, 7461
Mercury	7470, 7471, 7472
Nickel	6010, 6020, 7520, 7521
Selenium	6010, 7740, 7741, 7742
Silver	6010, 6020, 7760, 7761
Zinc	6010, 6020, 7950, 7951

Synthetic Precipitation Leaching Procedure (SPLP) - EPA Method 1312

Toxicity Characteristic Leaching Procedure (TCLP) - EPA Method 1311

Appendix C
DIVISION OF SITE REMEDIATION
HAZARDOUS MATERIAL RELEASE NOTIFICATION FORM

THIS FORM IS NOT TO BE USED TO REPORT AN IMMINENT HAZARD

1. Notifier Information

Name: _____

Address: _____

Phone: _____

Status: ___ Owner ___ Operator ___ Secured Creditor ___ Voluntary

2. Property Information

Name of Site: _____

Site Address: _____

Plat/Lot Numbers: _____

Site Contact Person: _____

Site Contact Phone: _____

Site Land Usage Type: ___ Residential ___ Industrial/Commercial

Location of Release: _____

_____
(attach site sketch as necessary)

3. Release Information

Date of Discovery: _____

Source : _____

Release Media: _____

Hazardous Materials and Concentrations: _____

_____
(attach certificates of analysis as necessary)

Extent of Contamination: _____

_____

_____

4. Resource Information

Site Land Usage: ___ Industrial/Commercial ___ Residential

Adjacent Land Usage: ___ Industrial/Commercial ___ Residential

Site Groundwater Class: ___ GA/GAA ___ GB

Adjacent Groundwater Class: ___ GA/GAA ___ GB
(if different than site groundwater classification within 500 feet)

Nearest Surface Water or Wetland:

___ Less Than 500 Feet ___ Greater Than 500 Feet

Potential for adverse impact ___ Yes/No

5. Potentially Responsible Parties

Name: _____

Address: _____

Status: ___ Owner ___ Operator ___ Other:_____

Name: _____

Address: _____

Status: ___ Owner ___ Operator ___ Other:_____

6. Measures Taken or Proposed to be Taken in Response to Release

_____

_____

_____

7. Other Significant Remarks About Release (Will a background determination be made?)

_____

_____

_____

Signature: _____ Date___/___/___

Title: _____

Appendix D
METHOD 2 DIRECT EXPOSURE CRITERIA

Method 2 Direct Exposure Criteria:

A. Ingestion:

i. Residential Activity:

1.Carcinogenic Substances:

RESIDENTIAL INGESTION ALGORITHM FOR CARCINOGENS IN SOIL:

$$C = \left(\frac{RISK \ x \ AT \ x \ CF}{CPSo \ x \ EF} \right) x \left(\frac{BW_a \ x \ BW_c}{BW_a \ x \ ED_c \ x \ IRS_c + BW_c \ x \ ED_a \ x \ IRS_a} \right)$$

2.Non-Carcinogenic Substances:

RESIDENTIAL INGESTION ALGORITHM FOR NON-CARCINOGENS IN SOIL:

$$C = \left(\frac{HI \ x \ RfD_o \ x \ CF}{EF} \right) x \left(\frac{BW_c \ x \ AT_c}{ED_c \ x \ IRS_c} \right)$$

3.Acute Toxicity:

ACUTE INGESTION ALGORITHM FOR SOIL:

$$C = \left(\frac{TDHA \; x \; IR_{at\text{-}w}}{IR_{at\text{-}s} \; x \; CF_{AT}} \right)$$

RESIDENTIAL DEFAULT INPUT PARAMETERS			
ORAL INGESTION			
TERM	**DESCRIPTION**	**UNITS**	**VALUE**
C	Concentration Of Contaminant In Soil	mg/kg	Calculated
CPSo	Carcinogenic Potency Slope Factor (Oral)	$(mg/kg/d)^{-1}$	Chemical Specific
RfDo	Reference Dose (Oral)	mg/kg/d	Chemical Specific
RISK	Target Cancer Risk Level	Dimensionless	1 E-06
HI	Hazard Index	Dimensionless	1.0
BW_a	Body Weight (Adult)	kg	70
BW_c	Body Weight (Child Ages 1-6)	kg	15
AT	Averaging Time (Carcinogens)	yr	70
AT_c	Averaging Time (Child Ages 1-6)	yr	6
IRS_a	Soil Ingestion (Adult)	mg/d	100
IRS_c	Soil Ingestion (Child Ages 1-6)	mg/d	200
CF	Conversion Factor	mg-d/kg-yr	3.65 E08*
EF	Exposure Frequency	d/yr	350
ED_a	Exposure Duration (Adult)	yr	24
ED_c	Exposure Duration (Child Ages 1-6)	yr	6
ORAL ACUTE TOXICITY			

RESIDENTIAL DEFAULT INPUT PARAMETERS			
TDHA	Ten Day Health Advisory (10 kg Child)	mg/l	Chemical Specific
IR_{at-w}	Ingestion Rate Of Water	l/d	1
IR_{at-s}	Ingestion Rate Of Soil	g/d	1
CF_{at}	Conversion Factor (Acute Toxicity)	kg/g	1 E-03

* Conversion factor: (365 d/yr)(1xE06 mg/kg) = 3.65 E08 mg-d/kg-yr:

ii. Industrial/Commercial Activity:

1.Carcinogenic Substances:

INDUSTRIAL/COMMERCIAL INGESTION ALGORITHM FOR CARCINOGENS IN SOIL:

$$C = \left(\frac{RISK \; x \; AT \; x \; CF}{CPSo \; x \; EF} \right) x \left(\frac{BW_a}{ED \; x \; IRS_a} \right)$$

2.Non-Carcinogenic Substances:

INDUSTRIAL/COMMERCIAL INGESTION ALGORITHM FOR NON-CARCINOGENS IN SOIL:

$$C = \left(\frac{HI \; x \; RfD_o \; x \; CF}{EF} \right) x \left(\frac{BW_a \; x \; AT_a}{ED \; x \; IRS_a} \right)$$

INDUSTRIAL\COMMERCIAL DEFAULT INPUT PARAMETERS			
TERM	**DESCRIPTION**	**UNITS**	**VALUE**
C	Concentration Of Contaminant In Soil	mg/kg	Calculated
CPSo	Carcinogenic Potency Slope Factor (Oral)	$(mg/kg/d)^{-1}$	Chemical Specific
RfDo	Reference Dose (Oral)	mg/kg/d	Chemical Specific
RISK	Target Cancer Risk Level	Dimensionless	1 E-06
HI	Hazard Index	Dimensionless	1
BW_a	Body Weight (Adult)	kg	70
AT	Averaging Time (Carcinogens)	yr	70
AT_a	Averaging Time, Adult (Non-carcinogens)	yr	25
IRS_a	Soil Ingestion Rate (Adult)	mg/d	50
EF	Exposure Frequency	d/yr	250
ED	Exposure Duration	yr	25
CF	Conversion Factor	mg-d/kg-yr	3.65 E08*

* Conversion factor: (365 d/yr)(1xE06 mg/kg) = 3.65 E08 mg-d/kg-yr:

B. Inhalation: The **RESIDENTIAL** inhalation concentration shall be calculated using the following equations and the appropriate default input values:

i. Carcinogenic Substances:

INHALATION ALGORITHM FOR CARCINOGENS IN SOIL:

$$C = \frac{RISK \ \ x \ AT \ \ x \ 365 \ \ d/yr}{URF \ \ x \ 1000 \ \ \mu g/mg \ \ x \ EF \ \ x \ ED \ \ x \left[\frac{1}{VF} + \frac{1}{PEF} \right] x \ TA}$$

ii. Non-Carcinogenic Substances:

INHALATION ALGORITHM FOR NON-CARCINOGENS IN SOIL:

$$C = \frac{HI \ x \ AT \ x \ 365 \ d/yr}{EF \ x \ ED \ x \left[\frac{1}{RfC} x \left(\frac{1}{VF} + \frac{1}{PEF} \right) \right] x \ TA}$$

iii. Volatilization Factor:

VOLATILIZATION FACTOR ALGORITHM:

$$VF\ (\ m^3/kg\ ) = (\ Q/C\ )\ x\ \frac{(\ 3.14\ x\ \alpha\ x\ T\ )^{1/2}}{(\ 2\ x\ D_{ei}\ x\ P_a\ x\ K_{as}\ )}\ x\ 10^{-4}\ m^2/cm^2$$

Where :

$$\alpha = \frac{D_{ei}\ x\ P_a}{P_a + (\ \rho_s\ )(\ 1 - P_a\ )/\ K_{as}}$$

RESIDENTIAL DEFAULT INPUT PARAMETERS			
INHALATION			
TERM	**DESCRIPTION**	**UNITS**	**VALUE**
C	Concentration Of Contaminant In Soil	mg/kg	Calculated
RISK	Target Cancer Risk Level (Carcinogens)	Dimensionless	10^{-6}
HI	Hazard Index (Noncarcinogens)	Dimensionless	1
AT	Averaging Time (Carcinogens)	years	70
AT	Averaging Time (Noncarcinogens)	years	30
URF	Inhalation Unit Risk Factor (Carcinogens)	$(\mu g/m^3)^{-1}$	Chemical Specific
RfC	Inhalation Reference Concentration (Noncarcinogens)	mg/m^3	Chemical Specific
EF	Exposure Frequency	days/year	350
ED	Exposure Duration	years	30
VF	Soil-To-Air Volatilization Factor	m^3/kg	Chemical Specific
PEF	Particulate Emission Factor	m^3/kg	4.51×10^9
TA	Time Adjustment Factor	Dimensionless	1

DEFAULT INPUT PARAMETERS			
VOLATILIZATION FACTOR			
TERM	**DESCRIPTION**	**UNITS**	**VALUE**
VF	Soil-To-Air Volatilization Factor	m^3/kg	Calculated
(Q/C)	Inverse Of The Mean Concentration At The Center Of A 0.5 Acre Square Source	g/m^2-s per kg/m^3	101.8
T	Exposure Interval	seconds	7.9×10^8
D_{ei}	Effective Diffusivity	cm^2/s	$D_i(P_a^{3.33}/P_t^2)$
P_a	Air-Filled Soil Porosity	Dimensionless	P_t-Θβ
P_t	Total Soil Porosity	Dimensionless	$1-(\beta/\rho_s)$
Θ	Soil Moisture Content	$\frac{cm^3\text{-water g-soil}}{}$	0.1 (10%)
β	Soil Bulk Density	g/cm^3	1.5
ρ_s	True Soil Density Or Particle Density	g/cm^3	2.65
K_{as}	Soil-Air Partition Coefficient	$\frac{g\text{-soil}}{cm^3\text{-air}}$	$(H/K_d) \times 41$
D_i	Diffusivity In Air	cm^2/s	Chemical Specific
H	Henry's Law Constant	atm-m^3/mol	Chemical Specific
K_d	Soil-Water Partition Coefficient	cm^3/g	K_{oc} x OC
K_{oc}	Organic Carbon Partition Coefficient	cm^3/g	Chemical Specific
OC	Organic Carbon Content Of Soil	fraction	0.02 (2%)

C. Soil Saturation Limit (Csat):

SOIL SATURATION LIMIT ALGORITHM FOR UNSATURATED SOILS (C_{sat}):

$$C_{sat} = \left(K_d \, x \, S \, x \, n_m \right) + \left(S \, x \, \Theta_m \right)$$

SOIL SATURATION (C_{sat}) DEFAULT INPUT PARAMETERS			
TERM	**DESCRIPTION**	**UNITS**	**VALUE**
C_{sat}	Soil Saturation Concentration	mg/kg	Calculated
K_d	Soil-Water Partition Coefficient	L/kg	Chemical Specific/ or K_{oc} * OC
K_{oc}	Organic Carbon Partition Coefficient	L/kg	Chemical Specific
OC	Organic Carbon Content Of Surface Soil	%	2
S	Solubility	mg/L-water	Chemical Specific
n_m	Soil Moisture Content	Weight Fraction	0.1
Θ_m	Soil Moisture Content	L-water/ kg-soil	0.1

Note: Appendix D was also utilized for the development of Method 1 Direct Exposure Criteria.

Appendix E
METHOD 2 LEACHABILITY CRITERIA

Method 2 Leachability Criteria:

A. Method 2 Leachability Criteria for Organic Hazardous Substances: The Method 1 Leachability Criteria were derived utilizing the SESOIL and AT123D models (available from General Science Services Corporation) to simulate the transport of organic hazardous substances and estimate levels of soil contamination which are protective of the appropriate groundwater objectives. The following tables provide the inputs to the models which were used to estimate the Method 1 Leachability Criteria for organic substances.

SESOIL CLIMATE INPUT PARAMETERS GENERAL		
Station Name - Providence WSO AP (Green State Airport)		
TERM	**UNITS**	**VALUE**
Latitude	Degrees	41.733
Longitude	Degrees	71.433
Number of Years of Climate Data	Years	1
Number of Years of Simulation	Years	5

SESOIL CLIMATE INPUT PARAMETERS BY MONTH							
TERM	**UNITS**	**OCT**	**NOV**	**DEC**	**JAN**	**FEB**	**MAR**
Air Temperature	^{o}C	12.330	6.720	0.280	-1.560	-1.110	2.720
Cloud Cover Fraction	fraction	0.500	0.600	0.600	0.600	0.600	0.600
Relative Humidity	fraction	0.750	0.700	0.750	0.700	0.700	0.700
Short Wave Albedo	-	0.180	0.190	0.270	0.290	0.330	0.290
Evapotranspiration*	cm/day	0.000	0.000	0.000	0.000	0.000	0.000
Rainfall Depth (Precipitation)	cm	9.010	10.980	11.170	10.170	9.500	10.670
Mean Storm Duration	days	0.560	0.530	0.560	0.560	0.600	0.570

SESOIL CLIMATE INPUT PARAMETERS BY MONTH							
Number of Storms per Month	-	4.390	5.720	6.000	5.660	5.260	5.890
Length of Rainy Season Within Month	days	30.400	30.400	30.400	30.400	30.400	30.400

SESOIL CLIMATE INPUT PARAMETERS BY MONTH (CONTINUED)							
TERM	**UNITS**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**
Air Temperature	^{o}C	8.170	13.280	18.440	21.610	20.940	17.330
Cloud Cover Fraction	fraction	0.600	0.600	0.600	0.500	0.500	0.500
Relative Humidity	fraction	0.700	0.700	0.750	0.800	0.800	0.800
Short Wave Albedo	-	0.190	0.180	0.180	0.180	0.180	0.180
Evapotranspiration*	cm/day	0.000	0.000	0.000	0.000	0.000	0.000
Rainfall Depth (Precipitation)	cm	10.590	9.060	7.370	7.490	9.900	8.620
Mean Storm Duration	days	0.540	0.470	0.370	0.310	0.390	0.420
Number of Storms per Month	-	5.600	5.830	5.190	4.750	5.220	4.500
Length of Rainy Season Within Month	days	30.400	30.400	30.400	30.400	30.400	30.400

* Initial evapotranspiration set to zero; SESOIL approximates evapotranspiration using the water budget method (mass balance).

SESOIL SOIL INPUT PARAMETERS		
TERM	**UNITS**	**VALUE**
Soil Name	-	-

SESOIL SOIL INPUT PARAMETERS		
Soil Bulk Density	g/cm^3	1.50
Intrinsic Permeability	cm^2	1.50E-07
Soil Disconnetedness Index	-	7.50
Effective Porosity	-	0.300
Organic Carbon Content (Subsurface Soil)	%	0.100
Cation Exchange Coefficient (Capacity)	milli eq. / 100g dry soil	0.000
Freundlich Equation Exponent	-	1.00

SESOIL APPLICATION INPUT PARAMETERS				
TERM	**UNITS**	**VALUE**		
Number of Years	years	1		
Number of Soil Layers	layers	3		
Application Area of Compartment	cm^2	0.10E+07		
Latitude of the Site (Application Area)	Degrees	41.733002		
Loading Type - (1) Spill - Instantaneous or (0) Steady Application - Continuous	-	0		
Loading Unit - (1) Mass per Unit Area or (0) Concentration	-	0		
Initial Chemical Concentration Given (1) or Not Given (0)	-	0		
Layer Number	-	1	2	3
Depths (Layer Thickness)	cm	0.10E+03	0.10E+03	0.10E+03

SESOIL APPLICATION INPUT PARAMETERS				
TERM	**UNITS**	**VALUE**		
Number of Sublayers/Layer	-	1	1	1
Ph of Each Layer	-	default	default	default
Intrinsic Permeability of Each Layer	cm^2	1.5E-7	1.5E-7	1.5E-7
Liquid Biodegradation (KDEL Ratios)	-	-	1.00	1.00
Solid Biodegradation (KDES Ratios)	-	-	1.00	1.00
Organic Carbon (OC) Content Ratios for Lower Layers	-	-	1.00	1.00
Cation Exchange Coefficient (CEC) Ratios for Lower Layers	-	-	1.00	1.00
Freundich (FRN) Ratio	-	-	1.00	1.00
Adsorption (ADS) Ratio	-	-	1.00	1.00
Pollutant Load Entering Each Layer	**$\mu g/cm^2$**	**0.00**	**LC***	**0.00**
Initial Pollutant Concentration for Any Sublayer	$\mu g/g$ (ppm)	-	-	-
Mass Transformed	$\mu g/cm^2$	0.00	0.00	0.00
Sink	$\mu g/cm^2$	0.00	0.00	0.00
Ligand Input Mass	$\mu g/cm^2$	0.00	0.00	0.00
Volatilization Index	-	0.20	0.20	0.20
Surface Runoff Participation Index	-	0.00	-	-
Ratio Pollutant Concentration in Rain to Pollutant Maximum Solubility in Water	-	0.00	-	-
Modified Summers Model Used (1) or Not (0) for Groundwater Concentration	-	0		

LC* = the back-calculated leachability criterion. This value can be converted to a mass concentration by the following:
(ug/cm^2)(1/Soil Bulk Density)(1/Layer Thickness)(mg/1000ug)(1000g/kg) = Leachability Criterion (mg/kg)

SESOIL CHEMICAL SPECIFIC INPUT PARAMETERS FOR: ALL CHEMICALS		
TERM	**UNITS**	**VALUE**
Base Hydrolysis Constant	l/mol-day	0.00
Acid Hydrolysis Constant	l/mol-day	0/00
Biodegradation Rate in Moisture	1/day	0.00
Biodegradation Rate on Soil	1/day	0.00
Ligand-Pollutant Stability Constant	-	0.00
No. Moles Ligand/Mole Pollutant	-	0.00
Ligand Molecular Weight	g/mole	0.00

AT123D INPUT PARAMETERS		
TERM	**UNITS**	**VALUE**
No. of Points in X-Direction	-	1
No. of Points in Y-Direction	-	1
No. of Points in Z-Direction	-	1
No. of Roots: No. of Series Terms	-	400
No. of Beginning Time Step	-	13
No. of Ending Time Step	-	61 *
No. of Time Intervals for Printed Out Solution	-	1
Instantaneous Source Control = 0 for Instant Source	-	1
Source Condition Control = 0 for Steady Source	-	60
Intermittent Output Control = 0 No Such Output	-	1
Case Control = 1 Thermal, = 2 for Chemical, = 3 RAD	-	2
Aquifer Depth, = 0.0 for Infinite Deep	m	0
Aquifer Width, = 0.0 for Infinite Wide	m	0
Begin Point of X-Source Location	m	-5
End Point of X-Source Location	m	5
Begin Point of Y-Source Location	m	-5
End Point of Y-Source Location	m	5
Begin Point of Z-Source Location	m	0
End Point of Z-Source Location	m	0
Hydraulic Conductivity	m/hr	0.53
Hydraulic Gradient	-	0.005
Longitudinal Dispersivity	m	20
Lateral Dispersivity	m	2
Vertical Dispersivity	m	2

AT123D INPUT PARAMETERS		
TERM	**UNITS**	**VALUE**
X Dimension	m	15
Y Dimension	m	0
Z Dimension	m	0

61 * = The SESOIL program only allows a maximum time interval run of 19 months. 61 months (5 years of simulation) was the total time interval used to determine the maximum groundwater impact.

B. Method 2 Leachability Criteria for Inorganic Hazardous Substances:

SITE-SPECIFIC DILUTION FACTOR ALGORITHM:

$$DF = 1 + (Kid/IL)(1 - F_{adj})$$

SITE-SPECIFIC DILUTION FACTOR			
TERM	**DESCRIPTION**	**UNITS**	**VALUE**
DF	Site-specific dilution factor		Calculated
K	Hydraulic conductivity of the unconsolidated aquifer underlying the release area	ft/yr	15000
i	Horizontal hydraulic gradient	ft/ft	0.005
d	Distance	ft	15
I	Infiltration rate	ft/yr	2.0
L	Length of the release area parallel to the direction of groundwater flow	ft	50
F_{adj}	Background concentration for groundwater divided by the appropriate groundwater objective for the hazardous substance, or, where the background concentration for groundwater can not be quantified, 1/2 the minimum detection limit for the hazardous substance divided by the appropriate groundwater objective for the hazardous substance.		Chemical - Specific

Appendix F
METHOD 2 GB GROUNDWATER OBJECTIVES

Method 2 GB Groundwater Objective Algorithm and Input Parameters:

GB GROUNDWATER OBJECTIVE ALGORITHM:

$$C_w = \frac{(C_a)(T)(WS)}{(VP)(MW)(16.04)}$$

METHOD 2 GB GROUNDWATER OBJECTIVE ALGORITHM AND DEFAULT INPUT PARAMETERS			
TERM	**DESCRIPTION**	**UNITS**	**VALUE**
C_w	Water Concentration	mg/L	Calculated
C_a	Air Concentration	mg/L	Chemical Specific PEL*
T	Temperature of groundwater	^oK	293
WS	Solubility	mg/L-water	Chemical Specific
VP	Vapor Pressure	mm Hg	Chemical Specific
MW	Molecular Weight	g/mole	Chemical Specific

* Permissible Exposure Limit (PEL):
The time-weighted average concentration in air that must not be exceeded during any 8-hour shift of a 40-hour work week.

The PELs were developed by the Occupational Safety and Health Administration (OSHA) to protect workers from "a wide variety of health effects that could cause material impairment of health or functional capacity. This includes protection against catastrophic effects such as cancer, cardiovascular, liver, and kidney damage; lung diseases, as well as more subtle effects resulting in central nervous system damage, narcosis, respiratory effects, and sensory irritation" .

NOTE: The Upper Concentration Limits for GB areas were calculated using the above algorithm and an air concentration C_a set equal to 10% of the Lower Explosive Limit (10% LEL) which is defined as ten percent (10%) of the concentration of a compound in air below which a flame will not propagate if the mixture is ignited.

Appendix G
FORM OF ENVIRONMENTAL LAND USAGE RESTRICTION

Instructions: Any environmental land use restriction pursuant to Rule 8.09 of the Remediation Regulations shall be in the following form. The appropriate information shall be inserted in the blanks shown, and the appropriate language shall be selected from the choices shown in brackets, or if none of the choices addresses the specific circumstance, substitute language shall be inserted.

ENVIRONMENTAL LAND USAGE RESTRICTION

This Declaration of Environmental Land Usage Restriction is made this day of , 1996, by ("the Grantor").

W I T N E S S E T H:

WHEREAS, Grantor is the owner in fee simple of certain real property (the "Property") known as [Address/Location located in the Town of in County][designated as Lot , Plat on the tax map of the Town of in County], more particularly described on Exhibit A (Legal Description of Property) which is attached hereto and made a part hereof; and

WHEREAS, the Grantor has determined that the environmental land use restriction set forth below is consistent with regulations adopted by the Department of Environmental Management ("the Department") pursuant to Section 23-19.1-14 of the Rhode Island General Laws; and

WHEREAS, the Grantor believes that this environmental land use restriction will effectively protect public health and the environment from hazardous substances; and

WHEREAS, the Department's written approval of this environmental land use restriction is contained in the document entitled: [Remedial Decision Letter/Settlement Agreement/Order of Approval] issued pursuant to the Remediation Regulations; and

WHEREAS, the Property [or portion thereof identified in the Class I survey which is attached hereto as Exhibit B and is made a part hereof] has been determined to be a Contaminated-Site and contains hazardous substances; and

WHEREAS, to prevent exposure to or migration of hazardous substances and to abate hazards to human health and/or the environment, and in accordance with the [Remedial Decision Letter/Settlement Agreement/Order of Approval], the Grantor desires to impose certain restrictions upon the use, occupancy, and activities of and at the Contaminated-Site; and

WHEREAS, Grantor intends that such restrictions shall run with the land and be binding upon and enforceable against Grantor and Grantor's successors and assigns.

NOW, THEREFORE, Grantor agrees as follows:

A. Purpose: In accordance with the [Remedial Decision Letter/Settlement Agreement/Order of Approval], the purpose of this environmental land use restriction is to assure:

[i. that the Contaminated-Site is not used for residential activities];

[ii. that groundwater at the Contaminated-Site is not utilized as potable water];

[iii. that humans engaged in residential activity are not exposed to soils at the Contaminated-Site containing hazardous substances in concentrations exceeding the applicable Department approved residential direct exposure criteria pursuant to the Remediation Regulations];

[iv. that water does not infiltrate soils at the Contaminated-Site containing hazardous substances in concentrations exceeding the applicable Department approved leachability criteria pursuant to the Remediation Regulations];

[v. that subsurface structures are not constructed over groundwater at the Contaminated-Site containing hazardous substances in concentrations exceeding the applicable Department approved GB Groundwater Objectives pursuant to the Remediation Regulations];

[vi. that the engineered control described in Exhibit C attached hereto is not disturbed and is properly maintained to prevent humans engaged in residential activity from being exposed to soils at the Contaminated-Site containing hazardous substances in concentrations exceeding the applicable Department approved residential direct exposure criteria pursuant to the Remediation Regulations, and/or that water does not infiltrate soils at the Contaminated-Site containing hazardous substances in concentrations exceeding the applicable Department approved leachability criteria pursuant to the Remediation Regulations].

B. Restrictions Applicable to the Contaminated-Site: In furtherance of the purposes of this environmental land use restriction, Grantor shall assure that use, occupancy, and activity of and at the Contaminated-Site are restricted as follows:

[i. No residential use of the Contaminated-Site shall be permitted];

[ii. Groundwater at the Contaminated-Site shall not be used as potable water];

[iii. Soil at the Contaminated-Site shall not be disturbed in any manner, including but not limited to...];

[iv. No building shall be constructed on the Contaminated-Site].

C. No action shall be taken, allowed, suffered, or omitted if such action or omission is reasonably likely to:

[i. Create a risk of migration of hazardous substances or potential hazard to human health or the environment]; or

[ii. Result in a disturbance of the structural integrity of any engineering controls designed or utilized at the Contaminated-Site to contain hazardous substances or limit human exposure to hazardous substances].

D. Release of Restriction; Alterations of Subject Area: Grantor shall not make, or allow or suffer to be made, any alteration of any kind in, to, or about any portion of any of the Contaminated-Site inconsistent with this environmental land use restriction unless the Grantor has first received the Department's written approval of such alteration. If the Department determines that the proposed alteration is significant it may require the amendment of this restriction. Insignificant alterations will be approved by the Department via a letter from the Department. The Department shall not approve any such alteration and shall not release the Property from the provisions of this environmental land use restriction unless the Grantor demonstrates to the Department's satisfaction that Grantor has managed the Contaminated-Site in accordance with the Remediation Regulations.

E. Notice to Lessees and Other Holders of Interests in the Property: Grantor, or any future holder of any interest in the Property, shall cause any lease, grant, or other transfer of any interest in the Property to include a provision expressly requiring the lessee, grantee, or transferee to comply with this environmental land use restriction. The failure to include such provision shall not affect the validity or applicability to the Property of this environmental land use restriction.

F. Severability and Termination: If any court of competent jurisdiction determines that any provision of this Environmental Land Usage Restriction is invalid or unenforceable, the Grantor shall notify the Department in writing within 14 days of such determination.

G. Binding Effect: All of the terms, covenants and conditions of this Environmental Land Usage Restriction shall run with the land and shall be binding on the Grantor, the Grantor's successors and assigns, and each owner and any other party entitled to possession or use of the Property during such period of ownership or possession.

H. Non-Compliance: In the event that the terms of this Restriction are violated by the grantor or any future holder of any interest in the Property, this Restriction and all other approvals and agreements relating to the contaminated site shall be null and void.

I. Terms Used Herein: The definitions of terms used herein shall be the same as the definitions contained in Section 3 (DEFINITIONS) of the Remediation Regulations.

It is so agreed:

_____

Grantor Date

So Sworn Before Me:

_____

Notary Date

My Commission Expires:

_____