



STATE OF VERMONT

Agency of Natural Resources

Natural Resource Damage Assessment and Restoration Rules

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VERMONT

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SUBCHAPTER 1 – GENERAL PROVISIONS

§ 36-101. Authority

These Rules are adopted by the Secretary of the Agency of Natural Resources pursuant to the authority granted by **10 V.S.A. § 6615d(c)**. The recovery of natural resource damages authorized under these Rules shall not limit the authority of the Secretary to seek or recover natural resource damages under other State law, federal law, or common law.

§ 36-102. Purpose

The purpose of these Rules is to make the environment and public whole for injuries to natural resources and loss of services resulting from the release of hazardous material. To fulfill this purpose, these Rules establish processes to assess injuries to natural resources, to assess expeditious and cost-effective alternatives for restoring injured natural resources and services lost, and to pursue implementation and funding of a restoration plan by potentially responsible parties. These Rules also provide opportunities for soliciting input from the public and other interested parties in conducting a damage assessment and selecting restoration alternatives.

§ 36-103. Applicability

These Rules apply to any party liable for a release of hazardous materials pursuant to **10 V.S.A. § 6615**. The Secretary and any other natural resource trustee shall not seek to recover natural resource damages under these Rules for the costs of damage assessment or restoration, rehabilitation, or acquisition of equivalent resources or services recovered by the Secretary or other trustee under authority of **10 V.S.A. chapter 159** or other law for the same release of hazardous material and the same natural resource injuries or services lost.

§ 36-104. Compliance with Other Laws

While taking any actions pursuant to these Rules, the Secretary shall ensure compliance with any other applicable state, federal, or local laws.

§ 36-105. Severability

The provisions of these Rules shall be severable. If any provision of these Rules or any application of these Rules to any person or circumstance is deemed to be invalid by a court of competent jurisdiction, the invalidity shall not affect other provisions or applications that can be given effect without the invalid provision or application.

§ 36-106. Coordination

- (a) Natural Resource Trustees.

- (1) Designation of trustees. If the trust resources of multiple Agency departments are impacted, injured, or likely to be injured by a release of hazardous materials, the Secretary may designate a trustee representative and an alternative trustee representative from each department, as appropriate. The Secretary may invite other agencies, departments, or divisions of state or local government with trust resources impacted, injured, or likely to be injured by a release of hazardous materials to participate in a natural resource damage assessment and restoration planning process, as appropriate.
 - (2) Coordination with response activities. Trustees shall act jointly under these Rules to ensure that restoration is achieved without double recovery of damages. Trustees shall coordinate their activities with concurrent response and remediation activities conducted by the Secretary and any other emergency response entities.
- (b) Potentially Responsible Parties (PRPs).
- (1) Notice. The Secretary shall notify a PRP of the Secretary's intent to conduct a natural resource damage assessment. The Notice shall be provided in accordance with **§ 36-405**.
 - (2) Scope of Participation; Factors. The amount of participation of a PRP may include conducting the natural damage assessment and any other activity required by the Secretary in accordance with these Rules. The scope of participation of a PRP shall be determined by the Secretary based on the following considerations, where applicable:
 - (A) Whether the PRP has been identified;
 - (B) The willingness or ability of the PRP to participate in the damage assessment;
 - (C) The willingness of the PRP to fund damage assessment activities;
 - (D) The willingness and ability of the PRP to conduct damage assessment activities in a technically sound and timely manner and to be bound by the results of jointly agreed-upon studies;
 - (E) The degree of cooperation of the PRP in the response to the releases; and
 - (F) The actions of the PRP in prior assessments, corrective action, or restoration efforts.

- (3) Coordination with Secretary. Based on the Secretary's determination under subdivision (b)(2) of this section, an action taken by the Secretary under these Rules may be conducted in coordination with the PRP or by the PRP at the direction of the Secretary. Pursuant to **§ 36-107** of this Subchapter, the Secretary may enter into a binding agreement with a PRP to facilitate coordination of activities conducted under these Rules and resolve any disputes during the natural resource damage assessment and restoration planning process.

- (c) Public. The Secretary shall provide an opportunity for public notice of decisions to conduct early restoration actions under **§ 36-402**, an opportunity for public notice of decisions to conduct damage assessment and restoration planning under **§ 36-405**, and an opportunity for public notice and comment in evaluation of restoration alternatives proposed under **§ 36-604** in accordance with the provisions for public involvement set forth in those sections. Additionally, the Secretary may provide opportunities for public involvement at any other time if the Secretary determines that such involvement will assist and inform the Secretary's decision-making or avoid delays in implementing restoration of injured natural resources and services.

§ 36-107. Coordination Agreements

At any time after a release of hazardous materials, the Secretary may enter into a binding agreement with a PRP or multiple PRPs to facilitate implementation and coordination of activities conducted pursuant to these Rules.

SUBCHAPTER 2 – DEFINITIONS

“Acquisition of or acquiring the equivalent or replacement” means the substitution for an injured resource with a resource that provides the same or substantially similar services, when the substitution: (a) is in addition to a substitution made or anticipated as part of a response action, and (2) exceeds the level of response action determined appropriate for the site under **10 V.S.A. §6615b**.

“Baseline condition” means the condition or conditions that would have existed at the area of assessed damaged had the release of hazardous material at or from the facility in question not occurred.

“Compensatory restoration” means any action taken to compensate for interim losses of natural resources and services that occur from the date of the release or discovery of the release until completion of restoration.

“Cost-effective” means the least costly natural resource damage assessment or restoration-related activity among two or more activities that provide the same or a comparable level of benefits.

“Damages” means the amount of money sought by the Secretary for the injury, destruction, or loss of a natural resource.

“Destruction” mean the total and irreversible loss of natural resources.

“Early restoration” means restoration action taken prior to completing a damage assessment and restoration planning under these Rules to avoid irreversible loss of natural resources, or to prevent or reduce any continuing danger to natural resources.

“Environmental Contingency Fund” means the Fund established by 10 V.S.A. § 1283.

“Ephemeral data” means types of information that change rapidly over time and may be lost if not collected immediately (e.g., within days or weeks).

“Exposure” means all or part of a natural resource is, or has been, in physical contact with a hazardous material, or with media containing a hazardous material.

“Injury” means a measurable adverse long-term or short-term change in the chemical or physical quality or viability of a natural resource resulting either directly or indirectly from exposure to a release of a hazardous material or exposure to a product of reactions from a release of hazardous materials. “Injury” encompasses the terms “destruction” and “loss.”

“Interim loss” means the loss of a natural resource and related services that occurs from the date of the release of hazardous materials to the restoration or recovery of the natural resource.

“Hazardous material” means any material defined as a hazardous material under 10 V.S.A. § 6602(16).

“Loss” means a measurable adverse reduction of a chemical or physical quality or viability of a natural resource.

“Natural resources” means fish, wildlife, biota, air, surface water, groundwater, wetlands, drinking water supplies, or State-held public lands.

“Natural resource damage assessment” means the process of collecting, compiling, and analyzing information, statistics, and data through prescribed methodologies to determine the amount of damages for injuries to natural resources.

“Pathway” means any link that connects a release of a hazardous material to a natural resource or service.

“Potentially responsible party” or **“PRP”** means any person liable under 10 V.S.A. § 6615 for the release of hazardous material for injury to, destruction of, or loss of a natural resource from the release.

“Pre-assessment” means a phase of the damage assessment and restoration process initiated by the Secretary where data is collected to make a determination to conduct a damage assessment and restoration planning.

“Primary restoration” means any action, including natural recovery, that returns injured natural resources and services to baseline.

“Release” means any intentional or unintentional action or omission resulting in the spilling, leaking, pumping, pouring, emitting, emptying, dumping, or disposing of hazardous materials into the surface or ground waters, or onto the lands in the State, or into waters outside the jurisdiction of the State when damage may result to the public health, lands, waters, or natural resources within the jurisdiction of the State.

“Restoring”, “restoration”, “rehabilitating”, or “rehabilitation” means actions undertaken to return an injured natural resource to its baseline condition, as measured in terms of the injured resource’s physical, chemical, or biological properties or the services it had previously provided, when such actions are in addition to a response action under 10 V.S.A. § 6615.

“Services” means the chemical, physical and biological functions performed by a natural resource, including the human uses of those functions.

“Surface waters” mean all rivers, streams, creeks, brooks, reservoirs, ponds, lakes, springs and all bodies of surface waters, artificial or natural, which are contained within, flow through or border upon the State or any portion of it.

“Value” means the maximum amount of goods, services, or money an individual is willing to give up to obtain a specific good or service, or the minimum amount of goods, services, or money an individual is willing to accept to forgo a specific good or service. The total value of a natural resource or service includes the value individuals derive from direct use and non-use values of the natural resource, for example, swimming, boating, hunting, or birdwatching, as well as the value individuals derive from knowing a natural resource will be available for future generations.

SUBCHAPTER 3 – [RESERVED]

SUBCHAPTER 4 – PRE-ASSESSMENT PHASE

§ 36-401. Applicability

Upon notification to the Secretary of a release or discovery of a release of hazardous materials, the Secretary may conduct pre-assessment activities in accordance with this Subchapter to determine whether to conduct a damage assessment and restoration planning pursuant to **Subchapters 5 and 6**, respectively. Where appropriate, the Secretary may first require early restoration actions prior to any such damage assessment and restoration planning in accordance with **§ 36-402**.

§ 36-402. Early Restoration

- (a) The Secretary may take early restoration action before completing a damage assessment and restoration planning under **Subchapters 5 and 6** if the Secretary determines that:
 - (1) The action is needed based on available information regarding a release to avoid an immediate and irreversible loss of natural resources, or to prevent or reduce any continuing danger to natural resources or similar need for emergency action;
 - (2) The action is feasible and likely to succeed;
 - (3) The action is not a response action undertaken by an emergency response agency; and
 - (4) The costs of the action are reasonable.
- (b) The Secretary shall provide notice to the public of all early restoration actions. Notice to the public shall include the justification for, nature and extent of, and results of early restoration actions within a reasonable time frame after completion of such actions and shall be made in accordance with the Type 5 public notice requirements of **10 V.S.A. § 7716(b)**.
- (c) The Secretary shall limit early restoration to emergency actions, and may only take such action if all requirements of subsection (a) of this section are met.

§ 36-403. Determination to Conduct Damage Assessment; Restoration Planning

- (a) The Secretary's decision to conduct a natural resource damage assessment and restoration planning shall be made upon consideration of the conditions

in (a)(1) through (a)(3) of this section and may be based on data collected in accordance with § 36-404 of these Rules. A damage assessment may only be made if:

- (1) Injury has resulted or is likely to result from the release;
 - (2) Corrective action has not or is not likely to adequately address the injury resulting from the release; and
 - (3) Primary or compensatory restoration actions exist to address injuries to natural resources.
- (b) If all conditions in subsection (a) of this section are met, the Secretary may issue notice under § 36-405, coordinate with a PRP in accordance with § 36-106, and conduct a damage assessment consistent with Subchapter 5 of this Rule.
- (c) If one or more of the conditions in subsection (a) is not met, the Secretary may not take additional action under this Rule except to take further actions to finalize a determination under subsection (a). The Secretary may recover all reasonable costs incurred in making the determination to conduct the damage assessment and restoration planning.

§ 36-404. Data Collection and Test Methodologies

- (a) In addition to the data collected as a part of a site investigation conducted in response to a release of a hazardous material, the Secretary may conduct data collection and analyses that are reasonably related to making a determination pursuant to § 36-403. Data collection conducted under this section shall be coordinated with site investigation and corrective action such that collection and analysis does not interfere a site investigation or corrective action.
- (b) The Secretary may collect and analyze the following types of data:
- (1) Data and information reasonably expected to be necessary determine liability pursuant to 10 V.S.A. §§ 6615 and 6615d(b) or make a determination to conduct a damage assessment and restoration planning under § 36-403;
 - (2) Ephemeral data; and
 - (3) Information needed to design or implement anticipated damage assessment procedures under **Subchapter 5** of this Rule.

- (c) When selecting testing and sampling methods to collect and analyze data, the Secretary may select methodologies:
 - (1) For which performance under conditions similar to those anticipated at the assessment area has been demonstrated;
 - (2) That ensure testing and sampling performance will be cost-effective;
 - (3) That will produce data that were previously unavailable and necessary to make a determination under **§ 36-403**; and
 - (4) That will provide data consistent with the requirements of injury determination and quantification in **§§ 36-502** and **36-503**.
- (d) Specific factors that may be considered when selecting testing and sampling methodologies include:
 - (1) Physical state of the released hazardous material;
 - (2) The duration, frequency, season, and time of the release;
 - (3) The range of concentrations of chemical compounds to be analyzed in different media;
 - (4) Detection limits, accuracy, precision, interferences, and time required to perform alternative methods;
 - (5) Potential safety hazards to obtain and test samples; and
 - (6) Cost of alternative methods.

§ 36-405. Damage Assessment, Restoration Planning; Notice of Intent

- (a) Upon a decision to conduct a natural resource damage assessment made in accordance with **§ 36-403**, the Secretary shall prepare a Notice of Intent to Conduct a Damage Assessment and Restoration Planning in accordance with this section.
- (b) The Notice of Intent to Conduct a Damage Assessment and Restoration Planning shall include the Secretary's determination made under **§ 36-403**. The notice shall also provide an analysis of that decision, which shall include the following:
 - (1) The facts relevant to the release;

- (2) The Secretary's authority to conduct a damage assessment as provided in **Subchapter 5** of this Rule and proceed with Restoration Planning as provided in **Subchapter 6** of this Rule;
 - (3) Natural resources and services that have likely been injured as a result of the release;
 - (4) Potential restoration actions relevant to the expected injuries; and
 - (5) If determined at the time, potential damage assessment procedures to evaluate the injuries and define the appropriate type and scale of restoration for the injured natural resources and services lost.
- (c) The Secretary shall make a copy of the Notice of Intent to Conduct a Damage Assessment and Restoration Planning publicly available in accordance with the Type 2 public notice requirements of **10 V.S.A. § 7713(b)**. The Secretary may solicit public comments on the notice depending on the nature and extent of the release.
- (d) The Secretary shall send a copy of the notice to all identified PRPs by certified mail, and invite all PRP to participate in the damage assessment and restoration planning in accordance with **§ 36-106(b)**.

SUBCHAPTER 5 – DAMAGE ASSESSMENT PHASE

§ 36-501. Applicability

- (a) Upon a determination to conduct a damage assessment and restoration planning and the issuance of a notice pursuant to **Subchapter 4**, the Secretary may conduct activities under this section that are required for an assessment of natural resources injured or services lost by the release of hazardous materials to inform the development of restoration alternatives in **Subchapter 6**. Activities undertaken as part of the damage assessment phase shall be cost-effective.
- (b) A damage assessment shall include:
 - (1) A determination of natural resource injured in accordance with **§ 36-502** of this section;
 - (2) A pathway determination in accordance with **§ 36-503** of this section; and
 - (3) A quantification of natural resource injury and services lost in accordance with **§ 36-504** of this section.
- (c) The following categories of reasonable costs may be incurred for activities conducted under this Subchapter:
 - (1) Sampling, testing, and evaluation costs associated with injury and pathway determination;
 - (2) Quantification costs, including baseline service determination and resource recoverability analysis;
 - (3) Any other assessment authorized by these Rules that are reasonably calculated to assess natural resource injury caused by a release of hazardous materials.
- (d) The reasonable costs for categories identified in subsection (c) of this section shall be limited to those costs incurred or anticipated by the Secretary for, and specifically allocable to, site-specific efforts taken in the assessment of damages under this Rule. Such costs shall be supported by appropriate records and documentation, and shall not reflect regular activities performed by the Agency in management of the natural resource.
- (e) In cases where damage assessment costs are incurred but the Secretary does not pursue natural resource restoration, the Secretary may recover reasonable damage assessment costs provided the assessment actions

undertaken were premised on the likelihood of injury and need for restoration.

§ 36-502. Injury Determination

- (a) The Secretary shall make a determination that injury has occurred to a natural resource(s) in accordance with the acceptance criteria associated with each specific natural resource type identified in subsections (c) through (f) of this section.
- (b) The Secretary may use data collected in accordance with **§ 36-404** and may conduct additional data collection to make a determination of injury under this section.
- (c) Injury to surface waters.
 - (1) An injury to a surface water resource shall be found to have resulted from the release of a hazardous material if one or more of the following changes in the physical or chemical quality of the resource is measured:
 - (A) Concentrations and duration of hazardous materials in excess of drinking water standards as established by Federal or State laws or regulations that establish such standards for drinking water, in treated surface water that was potable before the release;
 - (B) Concentrations and duration of hazardous materials that constitute a measurable adverse change in surface water quality;
 - (C) Concentrations and duration of hazardous materials in excess of the Vermont Water Quality Standards or other applicable water quality criteria established by Federal or State laws or regulations that establish such criteria, in surface water that before the release met the criteria. Also, when concentrations of hazardous materials in surface water exceeded the criteria before the release, concentrations and duration of hazardous materials found to cause further exceedance of Vermont Water Quality Standards after the release;
 - (D) Concentrations of hazardous materials on bed, bank, or shoreline sediments that are above concentrations for sediments adopted by the Secretary pursuant to the authority under **10 V.S.A. chapter 159** and any rules and procedures promulgated thereunder; or

- (E) Concentrations and duration of hazardous materials sufficient to have caused injury as defined in subsection (d), (e), or (f) of this section to groundwater, air, or biological resources, when exposed to surface water, suspended sediments, or bed, bank, or shoreline sediments.
- (2) The acceptance criterion for injury to a surface water resource is the measurement of concentrations of a hazardous material in a minimum of two samples from the resource. The samples shall be one of the following types, except as specified in subsection (c)(4) of this section:
 - (A) Two surface water samples from different locations, separated by a straight-line distance of not less than 100 feet; or
 - (B) Two bed, bank, or shoreline sediment samples from different locations separated by a straight-line distance of not less than 100 feet and in the case of sediments, collected from a representative depth; or
 - (C) One surface water sample and one bed, bank, or shoreline sediment sample;
 - (D) Two surface water samples from the same location collected at different times; or
 - (E) Other representative samples conducted pursuant to §29A-201 or Appendix G of the Vermont Water Quality Standards.
 - (3) If the maximum straight-line distance of the surface water resource is less than 100 feet, then the samples required in subsection (c)(2)(A) and (B) of this section shall be separated by one-half the maximum straight-line distance of the surface water resource.
 - (4) Injury to surface water may also be determined when physical, chemical, or biological reactions initiated by the release of hazardous materials has occurred and caused a change as described in (c)(1)(A)-(E) of this section.
- (d) Injury to groundwater resources.
 - (1) An injury to the groundwater resource shall be found to have resulted from the release of a hazardous material if one or more of the following changes in the physical or chemical quality of the resource is measured:

- (A) Concentrations and duration of hazardous materials that constitute a measurable adverse change in drinking water quality;
 - (B) Concentrations of hazardous materials in excess of groundwater enforcement standards established by the Vermont Groundwater Protection Rule and Strategy, in groundwater that before the release met the standard. Also, when concentrations of hazardous materials in groundwater exceeded the groundwater enforcement standards before the release, concentrations of hazardous materials found to cause further exceedance of groundwater enforcement standards after the release;
 - (C) Concentrations of hazardous materials sufficient to have caused injury or made unsuitable for existing agricultural uses;
 - (D) Concentrations of hazardous materials sufficient to have caused injury as defined in subsection (c), (e), or (f) of this section to surface water, air, or biological resources, when exposed to groundwater.
- (2) The acceptance criterion for injury to groundwater resources is the measurement of concentrations of hazardous material in accordance with the standards and criteria established in the Vermont Groundwater Protection Rule and Strategy.
- (3) Injury to groundwater may also be determined when physical, chemical, or biological reactions initiated by the release of hazardous materials has occurred and caused a change as described in (d)(1)(A)-(D) of this section.
- (e) Injury to air resources. An injury to the air resource shall be found to have resulted from the release of a hazardous material if one or more of the following changes in the physical or chemical quality of the resource is measured:
- (1) Monitored or modeled concentrations of emissions in excess of standards for hazardous air pollutants established by Section 112 of the Clean Air Act or Appendix C of the Vermont Air Pollution Control Regulations established for the protection of public welfare or natural resources; or
 - (2) Concentrations and duration of emissions sufficient to have caused injury as defined in subsection (c), (d), or (f) of this section to surface

water, groundwater, or biological resources when exposed to the emissions, including deposition of materials resulting from the release.

(f) Injury to biological resources.

- (1) An injury to a biological resource shall be found to have resulted from the release of a hazardous material if concentration of the hazardous material is determined by the Secretary to:
 - (A) Cause the biological resource or its offspring to have undergone at least one of the following adverse changes in viability: death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction), or physical deformations or parasitic infestations;
 - (B) Exceed levels for which the Vermont Department of Health has issued directives to limit or ban consumption of such organism; or
 - (C) Exceed criteria which the Secretary has issued to protect human health and aquatic biota in Appendix C of the Vermont Water Quality Standards.
- (2) The methods for determining injury to a biological resource, as defined in subsection (f)(1) of this section, shall be chosen by the Secretary based upon the capability of the method to demonstrate a measurable biological response in accordance with this subdivision. An injury can be demonstrated if the Secretary determines that the biological response under consideration can satisfy one or more of the following acceptance criteria:
 - (A) The adverse biological response has been shown in the scientific literature to be the result of exposure to the hazardous material. This criterion excludes biological responses that are caused predominately by other environmental factors such as disturbance, nutrition, trauma, or weather. The biological response shall be a commonly documented response in the scientific literature resulting from exposure to the hazardous material, or a biological response that is caused by other environmental factors but exacerbated by exposure to hazardous material.
 - (B) The biological response measurement is practical to perform and produces scientifically valid results. The biological response measurement shall be such that it is practical to perform the

biological response measurement and to obtain scientifically valid results.

- (C) The bio-criteria for fish and macroinvertebrate communities in Vermont wadeable streams and rivers in Appendix G of the Vermont Water Quality Standards and other appropriate methods of evaluation as approved by the Secretary.
- (3) Where appropriate, the Secretary may make a determination of injury to a biological resource through any of the methods listed in subdivision (A) through (G) of this subsection:
- (A) Death.
 - (i) Fish kill investigations. Injury has occurred when a significant increase in the frequency or numbers of dead or dying fish can be measured in a population sample from the assessment area as compared to a population sample from a control area, or in accordance with the procedures for counting dead or dying fish contained in Chapter 2 II (Fish-Kill Counting Guidelines) of “Investigation and Monetary Values of Fish and Freshwater Mussel Kills,” American Fisheries Society Special Publication Number 30, 2003.
 - (ii) Wildlife kill investigations. Injury has occurred when a significant increase in the frequency or number of dead or dying birds or animal species can be measured in a population sample from the assessment area as compared to a population sample from a control area.
 - (iii) Ambient biological sampling. Injury has occurred when criteria in §29A-306(a) of the Vermont Water Quality Standards for aquatic biota show noncompliance with applicable Class criteria in the affected area while a control sample shows compliance with such applicable criteria. Methods of collection and evaluation shall be in accordance with procedures and guidance approved by the ANR Secretary.
 - (iv) *In situ* and laboratory toxicity testing. Injury has occurred when a significant increase can be measured in the total mortality and/or mortality rates between population samples exposed *in situ* to the release of hazardous material and those in a control site. In laboratory toxicity tests, mortality and mortality rates are significantly different between samples of the test organisms placed in exposure chambers

containing concentrations of hazardous materials and those in a control chamber. The hazardous material used in the test shall be the exact material or a material comparable to the material that was released. Laboratory fish toxicity testing methodologies for acute flow-through, acute static, partial-chronic (early life stage), and chronic (life cycle) toxicity tests may be used to confirm injury.

- (B) Disease, cancer, lesions, neoplasia and parasitic infestation. Injury has occurred when a significant increase can be measured in the frequency of occurrence of one or more of the above anomalies when comparing population samples from the assessment area and a control area.
- (C) Behavioral abnormalities.
 - (i) Clinical behavioral signs of toxicity that shall be suspected of impairing the ability to survive in the wild for an individual or population. Injury has occurred when a significant increase can be measured in the frequency of occurrence of clinical behavioral signs of toxicity in a population sample from the assessment area as compared to a sample from the control area. The clinical behavioral sign of toxicity used may be those that have been documented in peer-reviewed published literature.
 - (ii) Avoidance. Injury has occurred when a significant increase can be measured in the frequency of avoidance behavior in population samples of fish native to the area placed in testing chambers with equal access to surface water containing a hazardous material and the control water. The hazardous material used in the test shall be the exact material or a material that is reasonably comparable to that suspected to have caused avoidance to the natural populations of fish.
- (D) Physical malfunctions: reduced production.
 - (i) Injury to avian populations has occurred when a significant decrease can be measured in the mean number of young fledged per active nest when comparing samples from populations in the assessment area and a control area.
 - (ii) Eggshell thinning. Injury has occurred when eggshell thicknesses for samples for a population of a given species at the assessment area are thinner than those for samples from a population at a control area.

- (iii) Injury to fish populations has occurred when a significant decrease in reproductive success between control organisms and test organisms can be measured based on the use of published laboratory toxicity testing methodologies. The hazardous material used in the test shall be the exact material or a material that is reasonably comparable to that suspected to have caused reduced reproductive success in the natural population of fish.
 - (E) Physiological malfunctions: Delta-aminolevulinic acid dehydratase (ALAD) inhibition. Injury has occurred when the activity level of whole blood ALAD in a sample from the population of a given species at an assessment area is significantly less than mean values for a population at a control area, and ALAD depression of at least 50 percent can be measured.
 - (F) Physical deformation.
 - (i) Overt external malformations. Injury has occurred when a significant increase can be measured in the frequency of overt external malformation when comparing samples from populations of aquatic or wildlife species from the assessment area to a control area.
 - (ii) Skeletal deformities, internal whole organ and soft tissue malformation. Malformations to brain, heart, liver, kidney, and other organs, or soft tissues of the gastrointestinal tract and vascular system injury has occurred when a significant increase can be measured in the frequency of skeletal deformities, malformations to brain, heart, liver, kidney, and other organs, when comparing samples from populations of wildlife species from the assessment area to a control area.
 - (G) Other measurable biological responses. The Secretary may rely on any other response to determine injury to a biological resource provided that the designated response satisfies one or more acceptance criterion provided in subsection (f)(2) of this section.
- (4) When a biological injury caused by a physical or biological stressor is found to be unrelated to the release of hazardous materials, biological injury shall not be determined.

§ 36-503. Pathway Determination

- (a) To determine the exposure pathways of the hazardous material, the following shall be considered:
 - (1) The chemical and physical characteristics of the released hazardous material when transported by natural processes or while present in natural media;
 - (2) The rate or mechanism of transport by natural processes of the released hazardous material;
 - (3) Combinations of pathways that, when viewed together, may transport the released hazardous material to the resource; and
 - (4) The methods for determining exposure pathway adopted by the Secretary pursuant to the authority under **10 V.S.A. chapter 159** and any rules and procedures promulgated thereunder.
- (b) A pathway may be determined by either demonstrating the presence of the hazardous material in the pathway resource or by using a model that demonstrates that the conditions existed in the route and in the hazardous materials such that the route served as the pathway.
- (c) To the extent that the information needed to make this determination is not available, tests shall be conducted and necessary data shall be collected to meet the requirements of these Rules. Methods that may be used to conduct these additional tests and collect new information are described in **§ 36-404**.

§ 36-504. Injury Quantification

- (a) In addition to determining whether injuries have resulted from a release, the Secretary shall quantify the extent of such injuries relative to baseline. The purpose of the Injury Quantification phase is to quantify the effects of the release of the hazardous material on the injured natural resources for use in determining the appropriate amount of compensation. Injury shall be quantified pursuant to the following steps:
 - (1) Measure the extent to which the injury demonstrated in the Injury Determination phase in §36-502 has occurred in the area impacted by the release of hazardous material;
 - (2) Measure the extent to which the injured resource differs from baseline conditions to determine the change attributable to the release;
 - (3) Determine the baseline condition by identifying the services normally performed by the injured resource, which are considered baseline services;

- (4) Estimate the time needed for the injured natural resource to recover to the state that the Secretary determines services are restored, rehabilitated, replaced, or the equivalent has been acquired to the baseline condition, and;
 - (5) Estimate the disruption of services resulting from the release, which is considered the change in services.
- (b) The Secretary shall quantify injuries in terms of any of the following:
- (1) The degree, and spatial and temporal extent of the injury to a natural resource;
 - (2) The degree, and spatial and temporal extent of injury to a natural resource, with subsequent translation of that injury to a reduction in services provided by the natural resource;
 - (3) The value of services lost as a result of the release; or
 - (4) A combination of the methods in (1) – (3) of this subsection.
- (c) In conducting the Injury Quantification analysis in (a) of this section, the Secretary may consider:
- (1) The nature, degree, and spatial and temporal extent of injury;
 - (2) The sensitivity, vulnerability, rareness, and scarcity of the injured natural resource and/or service;
 - (3) The reproductive and recruitment potential;
 - (4) The resistance and resilience (stability) of the affected environment;
 - (5) The natural variability; and
 - (6) The physical/chemical processes of the affected environment.

SUBCHAPTER 6 – RESTORATION PLANNING

§ 36-601. Applicability.

- (a) If the Secretary has determined that an injury to a natural resource or service has occurred pursuant to a damage assessment conducted in accordance with **Subchapter 5** of these Rules, the Secretary may conduct, or require the PRP to conduct, restoration planning activities in accordance with this Subchapter. If no determination of injury has been made, then Secretary may not take additional action under this Subchapter.
- (b) Activities conducted under this Subchapter shall include development and evaluation of restoration alternatives designed to make the public whole and to restore injured natural resources and the services they provide to baseline conditions in accordance with **§ 36-602 and § 36-603**, and the selection of a preferred restoration alternative in a restoration plan in accordance with **§ 36-604**.
- (c) The following types of reasonable costs may be incurred in the restoration planning phase:
 - (1) Restoration plan development costs, including:
 - (A) The Secretary’s development of alternatives;
 - (B) The Secretary’s evaluation of alternatives; and
 - (C) Potentially responsible party, agency, and public review of restoration alternatives.
 - (2) Cost estimation and valuation methodology calculation costs.

§ 36-602. Developing Restoration Alternatives

- (a) The Secretary shall consider a reasonable range of restoration alternatives before selecting a preferred alternative for restoration of natural resources injured by a release. Each alternative shall be designed so that, as a package of one or more restoration actions, the alternative(s) would make the environment and public whole. Only those alternatives considered technically feasible and in accordance with applicable laws, regulations, or permits may be considered further under these Rules.
- (b) Identification of alternatives.
 - (1) Primary restoration. For each alternative, the Secretary shall consider primary restoration actions, including a natural recovery alternative, in accordance with this subsection.

- (A) Natural recovery. The Secretary shall consider a natural recovery primary restoration alternative in which no human intervention would be taken to directly restore injured natural resources and services to baseline.
- (B) Accelerated recovery. The Secretary shall consider a primary restoration alternative comprised of actions to directly restore the natural resources and services to baseline on an accelerated time frame relative to natural recovery. When identifying such active primary restoration actions, the Secretary may consider actions that:
 - (i) Address conditions that would prevent or limit the effectiveness of any restoration action;
 - (ii) May be necessary to return the physical, chemical, or biological conditions necessary to allow recovery or restoration of the injured natural resources (e.g., replacing substrate or vegetation, or modifying hydrologic conditions); or
 - (iii) Return key natural resources and services, and would be an effective approach to achieving or accelerating a return to baseline (e.g., replacing essential species, habitats, or public services that would facilitate the replacement of other, dependent natural resource or service components).
- (2) Compensatory restoration. For each alternative, the Secretary shall also consider compensatory restoration actions in accordance with this subsection that are designed to compensate for the interim loss of natural resources and services pending recovery to baseline.
 - (A) To the extent practicable, the Secretary shall consider compensatory restoration actions that provide services of the same type and quality, and of comparable value as those injured.
 - (B) If, in the judgment of the Secretary, compensatory actions of the same type and quality and comparable value cannot provide a reasonable range of alternatives, the Secretary may identify actions that provide natural resources and services of comparable type and quality as those provided by the injured natural resources.
 - (C) Where the injured natural resources and services and replacement natural resources and services are not of

comparable value, the scaling process will involve valuation of lost and replacement services to appropriately compensate the public for natural resources injured and services lost.

- (c) **Scaling.** After the Secretary has identified the types of restoration actions in accordance with subsection (b) of this section, the Secretary shall determine the scale of those actions that will make the environment and public whole. For primary restoration actions, scaling generally applies to restoration actions involving replacement or acquisition of equivalent natural resources or services.
 - (1) **Resource-to-resource; service-to-service.** When determining the scale of restoration actions that provide natural resources or services of the same type and quality and of comparable value as those lost or injured, the Secretary may consider the use of a resource-to-resource or service-to-service scaling approach. Under these approaches, the Secretary determines the scale of restoration actions that will provide natural resources or services equal in quantity to those lost.
 - (2) **Valuation.** Where the Secretary has determined that neither resource-to-resource nor service-to-service scaling is appropriate, the Secretary may use the valuation scaling approach.
 - (A) Under the valuation scaling approach, the Secretary determines the amount of natural resources or services that shall be provided to produce the same value lost to the public. The Secretary shall explicitly measure the value of injured natural resources or services lost, and then determine the scale of the restoration action necessary to produce natural resources or services of equivalent value to the public.
 - (B) If, in the judgment of the Secretary, valuation of the lost services is feasible, but valuation of the replacement natural resources and services cannot be performed within a reasonable time frame or at a reasonable cost, the Secretary may estimate the dollar value of the lost services and select the scale of the restoration action that has a cost equivalent to the lost value. The PRP may request that the Secretary value the natural resources and services provided by the restoration action by following the process contained in a previous agreement pursuant to **§36-107**.
- (d) When scaling a restoration action, the Secretary shall evaluate the uncertainties associated with the restoration action, and shall discount all

service quantities and/or values to the date the demand is presented to the PRP.

§ 36-603. Evaluation of Restoration Alternatives

- (a) Once the Secretary has developed a reasonable range of restoration alternatives under **§ 36-602**, the Secretary shall evaluate the alternatives based on, at a minimum:
 - (1) The cost to carry out the alternative;
 - (2) The extent to which each alternative is expected to meet the Secretary's goals and objectives in returning the injured natural resources and services to baseline and compensating for interim losses;
 - (3) The likelihood of success of each alternative in restoring injured natural resources and services;
 - (4) The extent to which each alternative will prevent future injury as a result of the release, avoid collateral injury as a result of implementing the alternative, and protect existing ecosystems and habitat corridors;
 - (5) The extent to which each alternative benefits more than one natural resource or service; and
 - (6) The effect of each alternative on public health and safety.
- (b) Based on an evaluation of the factors under subsection (a) of this section, the Secretary shall select a preferred restoration alternative. If the Secretary concludes that two or more alternatives are equally preferable based on these factors, the Secretary shall select the most cost-effective alternative.
- (c) Where additional information is needed to identify and evaluate the feasibility and likelihood of success of restoration alternatives, the Secretary may implement restoration pilot projects. Pilot projects shall only be undertaken when, in the judgment of the Secretary, these projects are likely to provide the information, described in paragraph (a) of this section, at a reasonable cost and within a reasonable time frame.

§ 36-604. Restoration Plan

- (a) Once a preferred restoration alternative or alternatives have been identified pursuant to section **§ 36-603**, the Secretary shall develop a restoration plan developed in accordance with this section. The restoration plan shall serve as the basis for damages sought from a PRP for recovery for injury to natural resources or loss of services.

(b) Draft Restoration Plan.

- (1) Objectives; performance criteria. A draft restoration plan shall establish restoration objectives that are specific to the injuries identified and assessed under the damage assessment. These objectives shall clearly specify the desired outcome, and the performance criteria by which successful restoration will be judged. Performance criteria may include structural, functional, temporal, and/or other demonstrable factors, and shall be established in order to:
 - (A) Relieve the PRP of liability for conducting further assessment and restoration actions; or
 - (B) Require corrective actions in order to comply with the terms of a restoration plan or settlement agreement.
- (2) Contents. A draft restoration plan shall include, at a minimum:
 - (A) A summary of damage assessment procedures used;
 - (B) A description of the nature, degree, and spatial and temporal extent of injuries resulting from the release;
 - (C) The goals and objectives of restoration;
 - (D) The range of restoration alternatives considered, and a discussion of how such alternatives were developed under **§ 36-602**, and evaluated under **§ 36-603**;
 - (E) If an existing Restoration Plan or Project developed by the Secretary is being considered, how the Plan or Project is appropriate for use in relation to the release;
 - (F) Identification of the Secretary's preferred alternative;
 - (G) A description of past and proposed involvement of the PRP in the damage assessment; and
 - (H) A description of any monitoring requirements necessary to determine restoration effectiveness, including performance criteria that will be used to determine the success of restoration or need for interim corrective action.
- (3) Public process. The draft restoration plan shall be placed on public notice in accordance with **10 V.S.A. chapter 170** under Type 2 public notice and comment requirements.

- (c) **Final Restoration Plan.** A final restoration plan shall be developed to include the information specified in subsection (b) of this section, and shall be issued to the PRP and made available to the public in accordance with **10 V.S.A. § 7713(e)** and **Subchapter 7** of these Rules.

SUBCHAPTER 7 – RESTORATION IMPLEMENTATION PHASE

§ 36-701. Demand for Final Restoration

- (a) Presentation of Demand.
 - (1) The Secretary shall present the final restoration plan and a written demand to the PRP. The demand shall be developed in accordance with this section and shall be sent to the PRP through certified mail.
 - (2) The demand shall include the information required by subsection (b) of this section, and shall require the PRP to implement the final restoration plan subject to oversight of the Secretary, and to reimburse the Secretary for reasonable estimated costs expended in accordance with these Rules and estimated in accordance with **§ 36-703**.
- (b) The demand shall include:
 - (1) A description of the incident from which the claim for restoration arises, including a summary of the Secretary's findings made pursuant to Subchapters 4 and 5 of these Rules;
 - (2) An index to the administrative record;
 - (3) The Final Restoration Plan or Notice of Intent to Use an Existing Restoration Plan or Project; and
 - (4) A request for reimbursement of:
 - (A) Reasonable damage assessment costs, discounted as provided in **§ 36-703(a)**;
 - (B) The reasonable costs, if any, of conducting early restoration under **§36-402**, discounted as provided in **§ 36-703(b)**; and
 - (C) Interest on the amounts recoverable, as provided in **9 V.S.A. § 41a** (prejudgment interest) and **12 V.S.A. § 2903(c)** (interest on judgment liens).
 - (5) A request for payment or assurance for payment of the Secretary's reasonable estimated costs to implement the Final Restoration Plan if the PRP plans to decline implementation of the Final Restoration Plan.
- (c) The demand shall establish a time in which a PRP shall provide a written response to the demand in accordance with subsection (e). The timeframe for response may be modified by the Secretary at his or her discretion or upon a showing of good cause by a PRP. If a PRP fails to respond within the

timeframe established by the Secretary, the PRP will be deemed to have declined implementation of the Final Restoration Plan.

- (d) The Secretary may waive or reduce the request for reimbursement of interest on the amounts recoverable under (b)(1)(C) of this section.
- (e) A response by the PRP shall be required to include the following, where applicable:
 - (1) Payment for reimbursement of the Secretary's reasonable costs expended in accordance with these Rules, to be paid in a form and manner acceptable to and specified by the Secretary; and
 - (2) A commitment to implement the Final Restoration Plan, including any measures required in **§36-702**; or
 - (3) If the PRP declines implementation of the Final Restoration Plan:
 - (A) A provision of binding financial assurance for reimbursement of the Secretary's reasonable estimated costs to implement the Final Restoration Plan, in a form and manner acceptable to and specified by the Secretary; or
 - (B) A deposit of funds in the amount of the Secretary's reasonable estimated costs to implement the Final Restoration Plan into the Environmental Contingency Fund.
- (f) If the PRP partially or completely fails to respond to a demand in accordance with the requirements of (c) or (e) of this section, the Secretary may take enforcement action to compel compliance with the requirements of this Chapter.

§ 36-702. Implementation, Monitoring, Mitigation

- (a) The Secretary may take, or require the PRP to implement, the following additional actions to facilitate the implementation of a Final Restoration Plan:
 - (1) Develop more detailed work plans to implement the plan;
 - (2) Monitor and oversee restoration; and
 - (3) Evaluate the success of the restoration and the need for mitigation.
- (b) The reasonable costs of additional actions required under this section shall be recoverable by the Secretary as restoration costs. A demand for such costs or implementation of actions specified by the Secretary shall be made of the PRP and shall be deposited into the Environmental Contingency Fund. Such

a demand shall be made in accordance with any agreement, if one exists, between the Secretary and PRP pursuant to **§36-107**.

§ 36-703. Estimation of Reasonable Costs; Discounting and Compounding

- (a) Damage assessment; early restoration costs.
 - (1) The Secretary shall use methods consistent with generally accepted accounting principles in determining all costs incurred by the Secretary for damage assessment and early restoration activities under these Rules.
- (b) Future costs.
 - (1) The Secretary shall use methods consistent with generally accepted cost estimating principles in estimating future costs that will be incurred by the Secretary for implementation of restoration plan activities. The Secretary shall apply discounting methodologies in estimating these costs in accordance with subsection (b)(2) of this section.
 - (2) When determining estimated future costs of implementing final restoration plan activities, the Secretary shall discount such future costs back to the date a written demand is presented to the PRP pursuant to **Subchapter 7**. The Secretary may use a discount rate that represents the yield on recoveries available to the Secretary. The price indices used to project future inflation shall reflect the major components of the restoration costs.

§ 36-704. Accounting for Recovered Damages

- (a) Sums recovered for past assessment costs and early restoration costs shall be used to reimburse the Secretary and may be placed into the Environmental Contingency Fund.
- (b) Sums recovered by the Secretary in satisfaction of a natural resource damage claim shall be placed in the Environmental Contingency Fund to be used in accordance with 10 V.S.A. **§§ 1283(b)(10) and (11)** .
- (c) The Secretary shall maintain appropriate accounting and reporting procedures to document expenditures from the Environmental Contingency Fund.