

STATE OF VERMONT  
Agency of Natural Resources  
Department of Environmental Conservation

## Chapter 12 of the Environmental Protection Rules:

# GROUNDWATER PROTECTION RULE AND STRATEGY

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## **SUBCHAPTER 1 – GENERAL PROVISIONS**

### **§ 12-101      AUTHORITY**

This Rule is adopted by the Secretary under the authority granted by 10 V.S.A §§ 1390-1394.

### **§ 12-102      PURPOSE**

It is the purpose of this Rule to establish the following:

- (1) a system of management for the different classes of groundwater;
- (2) a process for the reclassification of groundwater;
- (3) standards for the protection of groundwater quality;
- (4) processes that must be incorporated into regulatory programs to ensure that activities that present a potential threat to groundwater are designed, managed, and permitted to protect groundwater resources; and
- (5) a system to protect the groundwater resources that are held in trust for the public.

### **§ 12-103      APPLICABILITY**

This Rule applies to all activities that are subject to the following Agency rules:

- (1) Solid Waste Management Rules;
- (2) Hazardous Waste Management Regulations;
- (3) Underground Storage Tank Rules;
- (4) Aboveground Storage Tank Rules;
- (5) Salvage Yard Rule;
- (6) Underground Injection Control Regulations;
- (7) Indirect Discharge Rule;
- (8) Stormwater Management Rule;
- (9) Stormwater Management Rule for Stormwater-Impaired Waters;

(10) Wastewater System and Potable Water Supply Rules (for wastewater systems only);  
and

(11) Investigation and Remediation of Contaminated Properties Rule.

#### § 12-104 PROVISIONS FOR INCORPORATION

(a) The Secretary, within five years of adoption of this Rule or prior to filing any proposed changes to a rule listed in Section 12-103 of this Rule with the Interagency Committee on Administrative Rules, whichever is sooner, shall review and revise as necessary each rule listed in Section 12-103 of this Rule to ensure the rule:

(1) Incorporates the following:

(A) restrictions on activities permitted in areas of each class of groundwater, from Subchapter 4 of this Rule;

(B) identification of compliance points, from Sections 12-603 of this Rule;

(C) procedure for requiring preventive and corrective actions, from Sections 12-606 and 12-607 of this Rule; and

(D) permitting prohibitions, from Section 12-604 of this Rule.

(2) Applies the groundwater enforcement standards and preventive actions levels established in Sections 12-601 and 12-602 of this Rule.

(3) Does not permit an activity that will adversely affect public trust uses.

(b) Subsequent to the initial review and revision required in Subsection (a), every seven years thereafter the Secretary shall review, and revise if necessary, the rules listed in Section 12-103 of this Rule to assure continued conformance with Subsection (a).

#### § 12-105 CLASSES OF GROUNDWATER

(a) The following groundwater classifications have been established by statute:

(1) Class I. Suitable for public water system. Character uniformly excellent. No exposure to activities which pose a risk to its current or potential use as a public water system.

(2) Class II. Suitable for public water system. Character uniformly excellent but exposed to activities which may pose a risk to its current or potential use as a public water system.

(3) Class III. Suitable as a source of water for a potable water supply, irrigation, agricultural use, and general industrial and commercial use.

(4) Class IV. Not suitable as a source of water for a potable water supply but suitable for some agricultural, industrial, and commercial use, provided the Secretary may authorize, subject to conditions, use as a source of potable water supply or other use under a reclassification order issued for the aquifer.

(b) Unless reclassified, all groundwater in the State is Class III.

#### § 12-106 SEVERABILITY

The provisions of this Rule are severable. If any provision of this Rule is found to be invalid, or if any application of this Rule to any person or circumstance is found to be invalid, the invalidity shall not affect other provisions that can be given effect in the absence of the invalid provision or application.

## SUBCHAPTER 2 – DEFINITIONS

### § 12-201 DEFINITIONS

As used in this Rule, the following terms shall have the specified meaning.

- (1) “Agency” means the Agency of Natural Resources.
- (2) “Activity” means all activities to which this Rule applies, as identified in Section 12-103 of this Rule.
- (3) “Aquifer” means a water bearing stratum of permeable rock, sand, gravel, or other soils.
- (4) “Background groundwater concentration” means the amount of a naturally occurring substance present in groundwater absent human actions or influence.
- (5) “Compliance point” means point of compliance as defined in this Subsection.
- (6) “Contamination” means the presence in groundwater of a substance in an amount exceeding the groundwater enforcement standard established for the substance.
- (7) “Existing use of groundwater” means any present use of groundwater, including use for potable water supplies, public water systems, and agricultural uses and all other non-potable groundwater uses.
- (8) “General permit” means a permit that applies to a class or category of discharges, emissions, disposal, facilities, or activities within a common geographic area, including the entire State or a region of the State.
- (9) “Groundwater” means water below the land surface in a zone of saturation.
- (10) “Groundwater enforcement standards” are those standards adopted pursuant to Section 12-601 of this Rule and contained in Appendix One.
- (11) “High potential risk activities” means the following activities:
  - (A) a solid waste landfill, except those that are closed in accordance with an enforcement action or a certification under the Solid Waste Management Rules;
  - (B) a hazardous waste treatment or disposal facility;
  - (C) the storage of a regulated substance in an underground storage tank with a capacity greater than 1,100 gallons;

- (D) the storage of a regulated substance in an aboveground storage tank with a capacity greater than 1,100 gallons;
  - (E) an automobile graveyard, as defined by 24 V.S.A. § 2241;
  - (F) a new indirect discharge of sewage using a disposal system with a design capacity greater than 50,000 gallons per day;
  - (G) the land application of biosolids or stabilized septage; and
  - (H) injection wells.
- (12) “Indirect discharge system” means an indirect discharge, as defined in the Indirect Discharge Rules, that is issued a discharge permit pursuant to the Indirect Discharge Rules.
- (13) “Individual permit” means a permit that authorizes a specific discharge, emission, disposal, facility, or activity that contains terms and conditions that are specific to the discharge, emission, disposal, facility, or activity.
- (14) “Injection well” means injection well, as defined in the Underground Injection Control Regulations, the discharge to which is issued a discharge permit, or otherwise permitted, pursuant to the Underground Injection Control Regulations.
- (15) “Moderate potential risk activities” means the following activities:
- (A) the storage of a regulated substance in an underground storage tank with a capacity less than or equal to 1,100 gallons;
  - (B) the storage of a regulated substance in an aboveground storage tank with a capacity less than or equal to 1,100 gallons;
  - (C) a solid waste storage or transfer facility with a leachate collection system;
  - (D) a hazardous waste storage facility;
  - (E) a hazardous waste generator that meets the requirements of Section 7-308(a) of the Vermont Hazardous Waste Management Regulations (Large Quantity Generators); and
  - (F) a new indirect discharge of sewage using a disposal system with a design with a capacity less than 50,000 gallons per day.



- (16) “Monitoring well” means a device used to monitor the depth or elevation of the piezometric surface, or groundwater quality, quantity, or both.
- (17) “New indirect discharge system” means either a new indirect discharge of sewage or a new indirect discharge of non-sewage waste, as defined in the Indirect Discharge Rules.
- (18) “Non-potable groundwater” means groundwater that is not potable groundwater or that will not be potable groundwater for at least five years, or is scientifically predicted to become unsuitable as a source of potable groundwater within five years.
- (19) “Permit” means a permit, certification, license, registration, determination, or similar form of permission required from the Secretary by law. However, the term excludes a professional license issued pursuant to 10 V.S.A. §§ 1936 (UST inspector licenses), 6607 (hazardous waste transporters), and 6607a (waste transportation).
- (20) “Person” means any individual, partnership, company, corporation, cooperative, association, unincorporated association, joint venture, trust, the state of Vermont or any department, agency, subdivision, or municipality, the United States government or any department, agency, or subdivision, or any other legal or commercial entity.
- (21) “Point of compliance” means the locations identified in Section 12-603 of this Rule.
- (22) “Potable groundwater” means groundwater meeting groundwater enforcement standards.
- (23) “Potable water supply” means potable water supply as defined in the Wastewater System and Potable Water Supply Rules.
- (24) “Proposed,” in reference to a public water source, means proposed in an application for a public water source permit or proposed in a petition to reclassify groundwater.
- (25) “Public trust use” means those uses of groundwater designated in this Rule as uses for which groundwater is held in the public trust. Public trust uses include existing and future uses of groundwater. Public trust uses can be competing uses.
- (26) “Public water source” means any groundwater used, or permitted to be used, as a source of drinking water for a public water system.
- (27) “Public water source protection area” means public water source protection area as defined in the Water Supply Rule.

- (28) “Public water system” means public water system as defined in the Water Supply Rule.
- (29) “Qualified Hydrogeologist” means a person with training or experience in hydrogeology, surficial geology, and bedrock geology sufficient to adequately prepare the hydrogeologic studies and analyses required by this Rule.
- (30) “Receptor” means any natural or human-constructed feature that may be adversely affected when contacted by groundwater that contains a substance in exceedance of the groundwater enforcement standards. Examples of receptors include public water sources, sources of water for potable water supplies, surface waters, wetlands, soils, sensitive ecological areas, outdoor and indoor air, and enclosed spaces such as basements, sewers, and subsurface utilities.
- (31) “Secretary” means the Secretary of the Agency of Natural Resources or the Secretary's duly authorized representative.
- (32) “Stormwater hotspot” means an area that generates higher concentrations of hydrocarbons, trace metals, and toxicants than are found in typical stormwater runoff.
- (33) “Technically impractical to achieve complete remediation” means a situation where the Secretary has determined, using the following factors, that it is impractical to remediate contamination to eliminate exceedances of the groundwater enforcement standards:
- (A) the nature of the subsurface geology;
  - (B) the types and physical properties of the substances in exceedance of the groundwater enforcement standards;
  - (C) the sources of contamination and causes of any exceedance of the groundwater enforcement standards;
  - (D) the amount of any hazardous material released;
  - (E) the date of the original release into the groundwater of the substances in exceedance of the groundwater enforcement standards (i.e., age of contamination);
  - (F) the fate and transport of the substances in exceedance of the groundwater enforcement standards;

- (G) whether technology or methods exist that can remediate the contamination to eliminate exceedances of the groundwater enforcement standards;
  - (H) whether remediation of the contamination to eliminate exceedances of the groundwater enforcement standards would result in greater harm to human health or the environment than either lesser remediation or no remediation;
  - (I) the cost effectiveness of remediation as measured by the cost of the technology or methods for remediation relative to the tangible environmental and health benefits to any receptor of the contaminated groundwater; and
  - (J) any other factors the Secretary determines are relevant.
- (34) “Vermont Action Levels” means the numeric guidelines reached and derived by the Vermont Department of Health for particular chemicals that have Maximum Contaminant Levels promulgated by the United State Environmental Protection Agency and are of specific public health interest as determined by the Vermont Department of Health.
- (35) “Wastewater System” means wastewater system as defined in the Wastewater System and Potable Water Supply Rules.

## **SUBCHAPTER 3 – PUBLIC TRUST**

### **§ 12-301 PUBLIC TRUST USES OF GROUNDWATER; GROUNDWATER QUALITY**

- (a) It is the policy of the State that the groundwater resources of the State are held in trust for the public.
- (b) This policy is accomplished in part by regulating groundwater withdrawal pursuant to the Groundwater Withdrawal Reporting and Permitting Rules, in a manner that benefits the people of the state and is compatible with long-range water resource planning, proper management, and use of the water resources of Vermont. This policy is also accomplished in part by minimizing the risks of groundwater quality deterioration by regulating human activities, pursuant to this Rule, that present risks to the use of groundwater in the vicinities of such activities while balancing the State's groundwater policy with the need to maintain and promote a healthy and prosperous agricultural community.
- (c) The following uses of groundwater are protected as public trust uses:
  - (1) withdrawal for fire suppression or other public emergency purposes;
  - (2) withdrawal for domestic, residential use;
  - (3) withdrawal for farming, as that term is defined in 6 V.S.A. Chapter 215, that is in compliance with the requirements of 6 V.S.A. Chapter 215;
  - (4) withdrawal for dairy processing conducted by dairy processors and milk handlers licensed in accordance with 6 V.S.A. § 2721;
  - (5) potable water supplies;
  - (6) public water systems; and
  - (7) closed loop, standing column, or similar non-extractive geothermal heat pumps.

### **§ 12-302 PERMITTING DETERMINATION**

- (a) An activity that is proposed for initial permitting or expansion and requires an individual permit shall not be permitted unless:
  - (1) the activity is presumed, pursuant to Section 12-303, to not adversely affect public trust uses and not to violate Section 604(a) of this Rule; or

- (2) the Secretary determines, on a case by case basis, that the activity will not adversely affect public trust uses and will not violate Section 604(a) of this Rule. In order for the Secretary to make this determination, an applicant must submit information sufficient for the Secretary to make each of the following affirmative findings:
  - (A) The activity will not prevent the public's future use of groundwater as a public water source or source of water for a potable water supply. The Secretary may make this finding if the applicant provides information demonstrating that, subsequent to ceasing the activity, the groundwater enforcement standards will not be exceeded at any point on the property on which the activity is to be located.
  - (B) If located within zone one or two of a public water source protection area, the activity is consistent with the purpose of the identified source protection area and of the approved source protection plan.
  - (C) If located within an overlay district established by a municipality pursuant to 24 V.S.A. § 4414(2) for the protection of aquifers or public water source protection areas, the activity is not inconsistent with the requirements of that overlay district.
  - (D) The activity will not otherwise adversely affect public trust uses.
  - (E) The activity will not result in an exceedance of the groundwater enforcement standards at points of compliance, except as indicated in Section 604(b) of this Rule.
- (b) An activity that is proposed for initial permitting or expansion and requires a notice of intent to operate under a general permit shall not be permitted unless:
  - (1) the activity is presumed, pursuant to Subsection (c), to not adversely affect public trust uses and not to violate Section 604(a) of this Rule; or
  - (2) the Secretary determines, on a case by case basis, that the activity will not adversely affect public trust uses and will not violate Section 604(a) of this Rule. In order for the Secretary to make this determination, an applicant must submit information sufficient for the Secretary to make each of the affirmative findings listed in Subsection (a)(2).
- (c) An activity that is proposed for initial permitting or expansion and that requires a notice of intent to operate under a general permit is presumed to not adversely affect public trust uses and not to violate Section 604(a) of this Rule when the general permit has been reviewed, and amended if necessary, by the Secretary to assure the general permit includes conditions that:

(1) Subject the activity to:

(A) performance or technical standards that constitute the best practical treatment and control technology. For the purposes of this Subsection, best practical treatment and control technology means performance or technical standards that the Secretary has determined are reliable and reasonably assure that the requirement in Section 12-302(a)(2)(A) of this Rule is met; or

(B) best management practices that constitute the best practical treatment and disposal practices. For the purposes of this Subsection, best practical treatment and disposal practices means a combination of operational requirements and design standards that the Secretary has determined are reliable and reasonably assure that the requirement in Section 12-302(a)(2)(A) of this Rule is met.

(2) Subject the activity to such additional performance or technical standards and best management practices that the Secretary deems necessary to ensure that the activity will not adversely affect public trust uses and will not violate Section 604(a) of this Rule.

(3) Require the applicant to certify, as part of the notice of intent to operate under the general permit, each of the following:

(A) If located within zone one or two of a public water source protection area, the activity is consistent with the purpose of the identified source protection area and of the approved source protection plan.

(B) If located within an overlay district established by a municipality pursuant to 24 V.S.A. § 4414(2) for the protection of aquifers or public water source protection areas, the activity is not inconsistent with the requirements of that overlay district.

#### § 12-303 GENERAL PRESUMPTION OF COMPLIANCE

(a) An activity that is proposed for initial permitting or expansion is presumed to not adversely affect public trust uses and not to violate Section 604(a) of this Rule when the rules to which the activity is subject have been reviewed, and revised if necessary, by the Secretary to assure the rules:

(1) Subject the activity to:

(A) performance or technical standards that constitute the best practical treatment and control technology. For the purposes of this Subsection, best practical treatment and control technology means performance or technical standards that the Secretary has determined are reliable and reasonably assure that the requirement in Section 12-302(a)(2)(A) of this Rule is met; or

- (B) best management practices that constitute the best practical treatment and control practices. For the purposes of this Subsection, best practical treatment and control practices means a combination of operational requirements and design standards that the Secretary has determined are reliable and reasonably assure that the requirement in Section 12-302(a)(2)(A) of this Rule is met.
- (2) Subject the activity to such additional performance or technical standards and best management practices that the Secretary deems necessary to ensure that the activity will not adversely affect public trust uses and will not violate Section 604(a) of this Rule.
- (3) Require the applicant to demonstrate as a part of the application process, or certify as part of the notice of intent to operate under the general permit, each of the following:
  - (A) If located within zone one or two of a public water source protection area, the activity is consistent with the purpose of the identified source protection area and of the approved source protection plan.
  - (B) If located within an overlay district established by a municipality pursuant to 24 V.S.A. § 4414(2) for the protection of aquifers or public water source protection areas, the activity is not inconsistent with the requirements of that overlay district.
- (b) The general presumption of compliance provided in this section shall not impede the Secretary's ability to take enforcement action if the activity adversely affects public trust uses or results in an exceedance of the groundwater enforcement standards at points of compliance.

## **SUBCHAPTER 4 – MANAGEMENT OF GROUNDWATER**

### **§ 12-401      MANAGEMENT OF CLASS I GROUNDWATER**

Class I groundwater shall be managed as follows:

- (1) The Secretary shall identify and reclassify groundwater to Class I in accordance with Subchapter 5 of this Rule.
- (2) The Secretary shall not permit high potential risk activities or moderate potential risk activities in Class I groundwater areas;
- (3) The Secretary shall not permit wastewater systems in Class I groundwater areas;
- (4) The Secretary shall not permit stormwater discharge systems that infiltrate to groundwater from stormwater hotspots in Class I groundwater areas.
- (5) The Secretary shall not permit other activities in Class I groundwater areas unless the applicant seeking approval for the activity demonstrates the activity complies with the requirements in Section 12-604 of this Rule.
- (6) The Secretary shall participate in Act 250, Section 248, and Section 248a proceedings when the Secretary determines that the proposed project may present a risk to groundwater quality in a Class I groundwater area and shall recommend that the District Environmental Commissions, in issuing Act 250 Land Use Permits, and the Public Service Board, in issuing Certificates of Public Good, require that the project conforms to this Rule.

### **§ 12-402      MANAGEMENT OF CLASS II GROUNDWATER**

Class II groundwater shall be managed as follows:

- (1) The Secretary shall identify and reclassify groundwater to Class II in accordance with Subchapter 5 of this Rule.
- (2) The Secretary shall not permit high potential risk activities in Class II groundwater areas.
- (3) The Secretary shall not permit other activities in Class II groundwater areas unless the applicant seeking approval for the activity demonstrates the activity complies with the requirements in Section 12-604 of this Rule.



- (4) The Secretary may participate in Act 250, Section 248, and Section 248a proceedings when the Secretary determines that the proposed project may present a risk to groundwater quality in a Class II groundwater area, in particular to the purpose for which the groundwater was reclassified as Class II, and may recommend that the District Environmental Commissions, in issuing Act 250 Land Use Permits, and the Public Service Board, in issuing Certificates of Public Good, require that the project conforms to this Rule.

#### § 12-403      MANAGEMENT OF CLASS III GROUNDWATER

Class III groundwater shall be managed as follows:

- (1) The Secretary shall not permit activities in Class III groundwater areas unless the applicant seeking approval for an activity demonstrates the activity complies with the requirements in Section 12-604 of this Rule.
- (2) The Secretary may participate in Act 250, Section 248, and Section 248a proceedings when the Secretary determines that the proposed project may present a risk to groundwater quality in a Class III groundwater area and may recommend that the District Environmental Commissions, in issuing Act 250 Land Use Permits, and the Public Service Board, in issuing Certificates of Public Good, require that the project conforms to this Rule.

#### § 12-404      MANAGEMENT OF CLASS IV GROUNDWATER

Class IV groundwater shall be managed as follows:

- (1) The Secretary shall not permit activities in a Class IV groundwater area unless the applicant seeking approval for an activity demonstrates the activity complies with the requirements in Section 12-604 of this Rule.
- (2) The Secretary shall not permit sources of water for potable water supplies or public water sources in a Class IV groundwater area, provided the Secretary may authorize, subject to conditions, use as a source of potable water supply or other use under a reclassification order issued for the aquifer.

- (3) The Secretary may participate in Act 250, Section 248, and Section 248a proceedings when the Secretary determines that the proposed project may cause or contribute to the deterioration of groundwater quality in a Class IV groundwater area in order to reduce or eliminate the impacts of the proposed project and may recommend that the District Environmental Commissions, in issuing Act 250 Land Use Permits, and the Public Service Board, in issuing Certificates of Public Good, require that the project conforms to this Rule.

## **SUBCHAPTER 5 – GROUNDWATER RECLASSIFICATION PROCESS**

### **§ 12-501 POLICY FOR GROUNDWATER RECLASSIFICATION**

- (a) The Secretary shall encourage and promote the reclassification of groundwater to Class I when the groundwater contains a permitted or existing public water source or has a high probability for use as a public water source, the character is uniformly excellent and there is no exposure to activities that pose a risk to its current or potential use as a public water source.
- (b) The Secretary shall encourage and promote the reclassification of groundwater to Class II when the groundwater has a high probability for use as a public water source and its character is uniformly excellent but exposed to activities that may pose a risk to its current or potential use as a public water source.
- (c) The Secretary shall support the reclassification of groundwater to Class IV when it would further the purpose of protecting human health by limiting human consumption of the groundwater and of returning, if possible, the groundwater to Class III as soon as practical in light of the circumstances, the potential harm, and the sources causing or contributing to contamination.

### **§ 12-502 RECLASSIFICATION OF GROUNDWATER TO CLASS IV**

- (a) The Secretary shall reclassify groundwater to Class IV when the Secretary learns the groundwater enforcement standards have been exceeded at a compliance point and when the Secretary determines that such exceedance is expected to last for five or more years from the date the Secretary learns of the exceedance, or the date of the submission of the reclassification petition, whichever is earlier, except if the Secretary reaches one of the following determinations:
  - (1) Institutional controls have been implemented to address the presence of all contamination such as deed restrictions that limit access to groundwater, municipal ordinances that limit the use of contaminated groundwater, and restrictive easements or covenants.
  - (2) All of the following exist:
    - (A) Groundwater yield is 0.1 gallons per minute or less.
    - (B) No contamination is acting nor will act as a source causing or contributing to contamination in an aquifer with sufficient yield.

- (C) Notice has been recorded and indexed in the land records for the municipality where the lot is located.
- (3) The contamination is not present due to human actions or influence and reclassification would not further the purposes identified in Section 12-501 of this Rule for reclassification of groundwater to Class IV.
- (4) All contamination poses a low risk. For the purposes of this determination, low risk exists when the following conditions are met:
  - (A) The groundwater enforcement standard is not exceeded, and will not be exceeded as a result of the contamination, at a receptor that is a public water source or a source of water for a potable water supply.
  - (B) A notice has been recorded and indexed in the land records for the municipality where the lot is located.
  - (C) A remediation plan required pursuant to Section 12-607 of this Rule or a corrective action plan required pursuant to 10 V.S.A. § 6615b exists for the site and either:
    - (i) the Secretary determines through a technical assessment of the contamination that, within ten years of the date the remediation plan or corrective action plan is initially approved or issued by the Secretary, natural attenuation of each substance will result in compliance with the groundwater enforcement standards at the points of compliance; or
    - (ii) the following two conditions are met:
      - (I) The area is served by municipal water, and there are no public or potable groundwater drinking water sources, or groundwater source protection areas, within 2,000 feet of the points of compliance; and
      - (II) the Secretary determines through technical assessment of the contamination that, within ten years of the date the remediation plan or corrective action plan is initially approved or issued by the Secretary, the groundwater enforcement standards will not be exceeded more than 1,000 feet beyond points of compliance and the plume will be receding.
- (b) The Secretary shall not reclassify groundwater to Class IV in order for it to be used for industrial discharges.
- (c) The Secretary shall require any person or persons who the Secretary determines is causing or contributing to an exceedance of the groundwater enforcement standards at a point of compliance that is the basis for the reclassification of groundwater to Class IV to take the following actions:

- (1) Submit an initial report with the elements identified in Section 12-606 of this Rule.
- (2) Submit a supplemental report with the elements identified in Section 12-606 of this Rule.
- (3) Take immediate actions to abate the risk to human health or the environment, as described in Section 12-606 of this Rule.
- (4) Implement a remediation plan with the goals of eliminating exceedances of the groundwater enforcement standards at points of compliance, as described in Section 12-606 of this Rule, and returning the groundwater to Class III.

§ 12-503 RECLASSIFICATION PETITION

(a) Petitioners.

- (1) The following persons may submit a petition to the Secretary to reclassify groundwater:
  - (A) any program or combination of programs within the Agency;
  - (B) the legislative body of the municipality in the area of the proposed reclassification;
  - (C) 25 or more persons affected by the proposed reclassification;
  - (D) any person affected by contamination in the area that could be reclassified to Class IV groundwater;
  - (E) for petitions to reclassify groundwater to Class I or II, the owner of a public water source located in the area of the proposed reclassification; or
  - (F) for petitions to reclassify groundwater from Class IV to Class III, a person who has completed actions authorized in a remediation plan required pursuant to Section 12-607 of this Rule.
- (2) When required by the Secretary within a remediation plan required pursuant to Section 12-607 of this Rule or a corrective action plan required pursuant to 10 V.S.A. § 6615b, a person who the Secretary determines is causing or contributing to an exceedance of the groundwater enforcement standards at a point of compliance shall submit a petition to the Secretary to reclassify groundwater to Class IV.

- (b) A petition can be submitted as a standalone document or included and incorporated in a permit application or a supplemental report required pursuant to Section 12-606 of this Rule. When a petition is part of another proceeding, the public participation and other procedural requirements of that proceeding shall apply to the petition.
- (c) Petition. A petition to reclassify groundwater shall, at a minimum, include:
- (1) Identification of the current classification and proposed reclassification and a description of the need for the proposed reclassification.
  - (2) Information describing the aquifer structure and groundwater flow regime developed by a qualified hydrogeologist, utilizing information from current and historic federal, state, and municipal data sources, and identifying, modeling, and addressing the following site components within the area proposed to be reclassified:
    - (A) bedrock and surficial geology (e.g. rock type, depositional environment);
    - (B) geological structure (e.g. fracture pattern, jointing, lineaments);
    - (C) soils (e.g. thickness, stratification, hydraulic properties);
    - (D) aquifer types;
    - (E) groundwater flow and direction, including estimated recharge and discharge areas;
    - (F) all existing uses of groundwater proposed to be reclassified, including high potential risk activities and moderate potential risk activities; and
    - (G) potential sources causing or contributing to contamination.
  - (3) A map of the proposed reclassification area delineated on a United States Geological Survey topographic map at a scale of 1:24,000, or at a scale that gives greater detail. The map shall include the following items:
    - (A) legend, graphical scale bar, north arrow, and the base map source;
    - (B) boundaries of the proposed reclassification area;
    - (C) property lines and SPANs, within the reclassification area and for all properties adjacent to the properties on which the proposed reclassification area extends;
    - (D) roads, within the proposed reclassification area and within 300 feet of the proposed boundaries;

- (E) surface waters, with identified classification if available, and any mapped outstanding resource water (e.g., vernal pools and wetlands) as shown on the Agency of Natural Resources Atlas, within the proposed reclassification area and within 300 feet of the proposed boundaries;
  - (F) existing groundwater withdrawal locations, including public water sources and sources of water for potable water supplies, and the well tags and Vermont State Plane northing and easting coordinates associated with such locations, within the proposed reclassification area and within 300 feet of the proposed boundaries;
  - (G) monitoring wells and well identification numbers, within the proposed reclassification area and within 300 feet of the proposed boundaries.
- (4) A digital Geographic Information System (GIS) shapefile, in the Vermont State Plane Coordinate System, that delineates the boundaries of the proposed reclassification area.
- (5) A narrative description of the following:
- (A) the current groundwater quality within the proposed reclassification area, including at points of compliance;
  - (B) consequences of potential contamination of the groundwater;
  - (C) quantity of groundwater within the area proposed for reclassification and availability in quantities needed for public trust uses;
  - (D) availability of alternate sources of water;
  - (E) existing uses of groundwater within the proposed reclassification area, including high potential risk activities and moderate potential risk activities; and
  - (F) method used to delineate the boundaries of the area proposed to be reclassified and justification for the method.
- (6) Compilation of all data available to the petitioner that documents the elements identified above or otherwise demonstrates the need for reclassification. This may include, but is not limited to, field data, published reports including previously submitted reports, and previously submitted permit applications. All materials shall be provided in pdf text searchable files or a compatible format. The Secretary may request data in a spreadsheet format.

- (7) Listing of names and contact information for all landowners of properties within the proposed classification area and adjoining landowners, indexed with the properties' SPANs. For the purposes of this Section, the term adjoining landowner includes a landowner of property that either shares a property boundary with a tract of land on which the proposed reclassification area extends or is adjacent to a tract of land on which the proposed reclassification area extends and is separated only by a river, stream, or public highway from that tract of land.

§ 12-504      ADDITIONAL INFORMATION REQUIRED

- (a) For petitions to reclassify groundwater to Class I, the following additional information shall be included in the petition for reclassification:
  - (1) Location of the proposed, permitted, or existing public water sources upon which the boundaries of the proposed reclassification area are based.
  - (2) An investigation of the area proposed to be reclassified showing that no high potential risk activities or moderate potential risk activities take place within the proposed boundaries of the reclassification area.
  - (3) A description of why there are no existing threats to the current or potential use of groundwater in the area of the proposed reclassification as a public water source, including a description of how the petitioner will protect such current or potential use through the acquisition of real property, easements, municipal zoning, or other means.
  - (4) Documentation that the proposed reclassification area:
    - (A) contains a permitted or existing public water source; or
    - (B) has a high probability for use as a public water source, which shall include the following:
      - (i) projected maximum demand figure for each proposed public water source upon which the boundaries of the proposed reclassification area are based; and
      - (ii) a hydrogeologic study indicating that the area proposed for reclassification could reasonably meet each projected public water source demand.
  - (5) Documentation of the uniformly excellent water quality throughout the proposed reclassification area.
  - (6) Documentation identifying and explaining how reclassification to Class I is consistent with:



- (A) any municipal or regional plan provisions that address the quality or use of groundwater or the long-range management of groundwater resources;
  - (B) any provisions of an overlay district established by a municipality pursuant to 24 V.S.A. § 4414(2) for the protection of aquifers; and
  - (C) any provisions of an approved source protection plan.
- (b) For petitions to reclassify groundwater to Class II, the following additional information shall be included in the petition for reclassification:
- (1) Location of the proposed, permitted, or existing public water sources upon which the boundaries of the proposed reclassification area are based.
  - (2) An investigation of the area proposed to be reclassified showing that no high potential risk activities take place within the proposed boundaries of the reclassification area.
  - (3) An identification of potential threats to the current or potential use of groundwater in the area of the proposed reclassification as a public water source, including a description of how the petitioner will protect such current or potential use from the threat of future harm through the acquisition of real property, easements, municipal zoning, or other means.
  - (4) Documentation that the proposed reclassification area:
    - (A) contains a permitted or existing public water source; or
    - (B) has a high probability for use as a public water source, which shall include the following:
      - (i) the documented projected maximum demand figure for each proposed public water source upon which the boundaries of the proposed reclassification area are based; and
      - (ii) a hydrogeologic study indicating that the area proposed for reclassification could reasonably meet each projected public water source demand.
  - (5) Documentation of the uniform excellent water quality throughout the proposed reclassification area.
  - (6) Documentation identifying and explaining how reclassification to Class II is consistent with:

- (A) any municipal or regional plan provisions that address the quality or use of groundwater or the long-range management of groundwater resources;
  - (B) any provisions of an overlay district established by a municipality pursuant to 24 V.S.A. § 4414(2) for the protection of aquifers; and
  - (C) any provisions of an approved source protection plan.
- (c) For petitions to reclassify groundwater to Class IV, the following additional information shall be included in the petition for reclassification:
- (1) Identification of the substances in the groundwater that are in exceedance of the groundwater enforcement standards at a point of compliance, including an identification of the source or sources that are causing or contributing to the exceedance of the groundwater enforcement standards.
  - (2) A description of the fate and transport of the substances in the groundwater that are in exceedance of the groundwater enforcement standards at a point of compliance, including:
    - (A) the extent of the area contaminated with substances in exceedance of the groundwater enforcement standards;
    - (B) a description of the stability of each contaminant plume (stable, declining, expanding)
    - (C) any projected expansion of the substances for five years after the date of the petition;
    - (D) any projected retreat of the substances for five years after the date of the petition; and
    - (E) the distribution of substances in the groundwater, soil, and bedrock as appropriate including:
      - (i) the distribution of the substances in aqueous, non-aqueous, sorbed, and vapor phases; and
      - (ii) any other site specific data as appropriate to demonstrate the extent of the contamination and the long term fate and transport of the substances in the subsurface including:
        - (I) vertical distribution of contamination by the substances in the groundwater;

- (II) horizontal and vertical hydraulic gradients in groundwater;
  - (III) chemical mass transfer flux between geologic units if this information is available;
  - (IV) chemical degradation rates if available;
  - (V) chemical degradation byproducts if available; and
  - (VI) chemical mass flux to any surface water bodies if applicable.
- (d) For petitions to reclassify groundwater from Class IV to Class III, the following additional information shall be included in the petition for reclassification:
- (1) Information demonstrating that actions authorized in a remediation plan required pursuant to Section 12-607 of this Rule have successfully reduced the contamination to eliminate exceedances of the groundwater enforcement standards within the area proposed to be reclassified.
- (e) The Secretary may require additional information necessary for the Secretary to make a final reclassification decision.

## § 12-505 PUBLIC PARTICIPATION

- (a) Notice of petition.
- (1) Following receipt of an administratively complete petition to reclassify groundwater, the Secretary shall provide notice of receipt of the petition and a copy of the petition through the Environmental Notice Bulletin.
  - (2) Within 7 calendar days of the Secretary's determination that the petition is administratively complete, the petitioner shall provide notice of the petition on a form developed by the Secretary that includes, at a minimum, instructions on how to access the petition through the Environmental Notice Bulletin and continue to receive notices and information concerning the petition, that is sent to the following persons by U.S. mail:
    - (A) the town clerk for each municipality in which the groundwater proposed for reclassification is located;
    - (B) the regional planning commission for each municipality in which the groundwater proposed for reclassification is located; and
    - (C) each landowner identified pursuant to Section 12-503(c)(7) of this Rule.

- (3) Within 7 calendar days of the Secretary's determination that the petition is administratively complete, the petitioner shall also provide notice of the petition to the general public by publishing an announcement in a newspaper of general circulation in each municipality in which the groundwater proposed for reclassification is located which includes the name and e-mail or mailing address for the petitioner, a brief description of the proposed reclassification, and instructions on how to access the petition through the Environmental Notice Bulletin and continue to receive notices and information concerning the petition.

(b) Draft decision, Public comment period, and Public informational meeting.

- (1) When the Secretary has issued a draft decision on a petition to reclassify groundwater, the Secretary shall provide notice of the draft decision and a copy of the draft decision through the Environmental Notice Bulletin. The draft decision shall include a draft reclassification order, if applicable.
- (2) In association with the notice of the draft decision, Secretary shall provide a public comment period for no less than 30 calendar days.
- (3) Any person may request a public informational meeting within 14 calendar days of the notice of the draft decision. The Secretary shall hold a public informational meeting whenever any person files a written request for such a meeting. If no person requests a public informational meeting, the Secretary may hold such a meeting at his or her discretion.
- (4) When a public informational meeting is held, the Secretary shall provide at least 14 calendar days' notice of the location, date, and time of the public informational meeting through the Environmental Notice Bulletin. The public comment period shall be extended such that it does not end until at least 7 days following the public informational meeting.

(c) Final decision.

- (1) When the Secretary has issued a final decision on a petition to reclassify groundwater, the Secretary shall provide notice of the final decision, a copy of the final decision, and a response to comments through the Environmental Notice Bulletin. The final decision shall include a final reclassification order, if applicable.
- (2) When a decision reclassifies groundwater to Class IV, the Secretary shall provide notice to all Vermont licensed well drillers.

(d) Consultation with the groundwater coordinating committee.

- (1) The Secretary may solicit comments from the groundwater coordinating committee on a petition prior to issuing a draft decision.
- (2) The Secretary may solicit comments from the groundwater coordinating committee during the public comment period.
- (3) The Secretary shall give comments of the committee due consideration.

§ 12-506 RECLASSIFICATION DECISION

- (a) Reclassification decision. The draft and final decisions on the petition to reclassify groundwater shall contain the following:

- (1) The Secretary's affirmative findings on the following:
  - (A) That the factual information provided in accordance with the requirements of Sections 12-503 and 12-504 of this Rule adequately supports the petition for reclassification.
  - (B) If reclassification of groundwater to Class I, that the groundwater contains a permitted or existing public water source or has high probability for use as a public water source, that the character is uniformly excellent, and that there is no exposure to activities that pose a risk to its current or potential use as a public water source.
  - (C) If reclassification of groundwater to Class II, that the groundwater contains a permitted or existing public water source or has a high probability for use as a public water source and that its character is uniformly excellent despite exposure to activities that may pose a risk to its current or potential use as a public water source.
  - (D) If reclassification of groundwater to Class I or II, such reclassification is consistent with:
    - (i) any municipal or regional plan provisions that address the quality or use of groundwater or the long-range management of groundwater resources;
    - (ii) any provisions of an overlay district established by a municipality pursuant to 24 V.S.A. § 4414(2) for the protection of aquifers; and
    - (iii) any provisions of an approved source protection plan.

- (E) If reclassification of groundwater to Class III, that the groundwater is suitable as a source of water for a potable water supply, irrigation, agricultural use, and general industrial and commercial use.
  - (F) If reclassification of groundwater to Class IV, that the groundwater is not suitable as a source of water for a potable water supply, provided the Secretary may authorize, subject to conditions, use as a source of potable water supply or other use under a reclassification order issued for the aquifer.
- (2) A map in digital format that clearly delineates the boundaries of the reclassified area and includes a description of the area. The boundaries shall be identified on the map in a manner that allows for easy location at the site (e.g., using natural features, straight lines, placed monuments, property lines).
- (b) Legislative approval for select reclassifications pursuant to 10 V.S.A. § 1394(f). No classification of groundwater that involves privately owned land to Class I shall take effect until approved by an Act of the Vermont General Assembly. No reclassification of groundwater from Class I to another class shall take effect until approved by an Act of the Vermont General Assembly.

## **SUBCHAPTER 6 – STANDARDS; BACKGROUND GROUNDWATER QUALITY; PREVENTIVE AND CORRECTIVE ACTIONS**

### **§ 12-601 ESTABLISHMENT OF GROUNDWATER ENFORCEMENT STANDARDS**

- (a) The Secretary adopts and establishes the groundwater enforcement standards contained in Appendix One.
- (b) When a compliance point is a receptor that is a public water source or a source of water for a potable water supply, the Vermont Action Level established by the Department of Health and contained in Appendix One shall apply in lieu of the groundwater enforcement standard and operate as that standard for the purposes of this Rule for the compliance point.

### **§ 12-602 ESTABLISHMENT OF PREVENTIVE ACTION LEVELS**

In order to provide early warning of a potential exceedance of the groundwater enforcement standards, a preventive action level contained in Appendix One has been adopted and established for each groundwater enforcement standard.

- (1) For all substances that have carcinogenic, mutagenic, or developmental toxicity properties, as established by the U.S. Environmental Protection Agency or determined by the Vermont Department of Health, the preventive action level is 10% of the groundwater enforcement standard, adjusted for analytical laboratory reporting limits.
- (2) The preventive action level for all other listed substances is 50% of the groundwater enforcement standard, adjusted for analytical laboratory reporting limits.

### **§ 12-603 ESTABLISHMENT OF COMPLIANCE POINTS**

- (a) A single activity may have multiple compliance points.
- (b) Activities, except wastewater systems and indirect discharge systems, shall have the following compliance points:
  - (1) any point of present use of groundwater, including use as a public water source or as a source of water for potable water supplies;
  - (2) the boundary of a Class I, Class II, or Class IV groundwater area;
  - (3) zone two of a public water source protection area; and
  - (4) any point at the boundary of the property where the activity is located.
- (c) Wastewater systems shall have the following compliance points:

- (1) the boundary of a Class I, Class II, or Class IV groundwater area; and
  - (2) any point on the boundary of the wastewater system presumptive isolation zone as defined in the Wastewater System and Potable Water Supply Rules.
- (d) Indirect discharge systems shall have the following compliance points:
- (1) the boundary of a Class I, Class II, or Class IV groundwater area; and
  - (2) any point 150 feet upgradient from a leachfield or sprayfield or land application area and any point 300 feet downgradient from a leachfield or sprayfield or land application area, as measured from:
    - (A) for a leachfield in a mound, the corners of the basal area of the mound;
    - (B) for a leachfield not in a mound, the corners of the leachfield stone or other application surface; and
    - (C) for a sprayfield or land application area, the edges of the disposal area or the land application area.
- (e) In addition to the compliance points established pursuant to Subsection (b), the following activities shall have the following additional compliance points:
- (1) For an active certified solid waste landfill operational unit: no more than 150 meters from the edge of the liner in the hydraulically down-gradient direction.
  - (2) For certified hazardous waste treatment or disposal facilities, including waste piles, landfills, and surface impoundments: the edge of the regulated activity.
  - (3) For injection wells: a case-by-case determination.
  - (4) For underground storage tanks: outside of the underground tank system.
- (f) The Secretary may, and a person may petition the Secretary to, modify the horizontal distances and associated compliance points identified in Subsection (b), (c), or (d) on a case-by-case basis.
- (1) The Secretary may adopt or approve an increase or decrease to the horizontal distance if the Secretary determines, taking into account the characteristics identified in Subsection (f)(3), that the increase or decrease will not result in potential exceedances of the groundwater enforcement standards or that the increase or decrease is necessary in order to protect an existing use of groundwater.



- (2) The Secretary shall not approve an increase to the horizontal distance that would allow a compliance point to be located beyond the boundary of the property on which the activity is located.
- (3) The petitioner seeking a modification to the horizontal distance shall provide the Secretary with information on all of the following characteristics and evidence that the proposed change will not result in potential exceedances of the groundwater enforcement standards at a point of any existing use of groundwater:
  - (A) site topography;
  - (B) nature, thickness, and permeability of unconsolidated materials;
  - (C) nature and permeability of bedrock;
  - (D) groundwater depth, flow direction, and velocity;
  - (E) volume, type, and characteristics of potential sources that may result in contamination, including waste loading;
  - (F) mobility of substances that cause or contribute to contamination;
  - (G) distances to property boundaries and surface waters;
  - (H) engineering design of the activity;
  - (I) life span of the activity;
  - (J) present use of land and groundwater; and
  - (K) potential abatement options if the groundwater enforcement standards are exceeded.
- (4) The Secretary may request additional information from the petitioner when the Secretary determines such information would aid in the determination of whether modification to the horizontal distance would result in potential exceedances of the groundwater enforcement standards or is necessary in order to protect an existing use of groundwater.

§ 12-604      PERMITTING PROHIBITIONS

- (a) The Secretary shall not permit an activity that will result in an exceedance of the groundwater enforcement standards at points of compliance, except as indicated in Subsection (b).

- (b) The Secretary shall not authorize a remediation plan required pursuant to Section 12-607 of this Rule, or a corrective action plan required pursuant to 10 V.S.A. § 6615b, that permits activities that will result in an exceedance of the groundwater enforcement standards at a point of compliance or otherwise adversely affect an existing use of groundwater, unless it is technically impractical to achieve complete remediation of the substances for which the groundwater enforcement standards will be exceeded.

§ 12-605 BACKGROUND GROUNDWATER QUALITY

- (a) Application for determining background groundwater quality. A person seeking to establish background groundwater quality, in a particular area, for a substance for which a groundwater enforcement standard has been established shall submit the following to the Secretary for the Secretary's review and approval, prior to conducting sampling:
- (1) Information describing the aquifer structure and groundwater flow regime developed by a qualified hydrogeologist, utilizing information from current and historic federal, state, and municipal data sources, and identifying, modeling, and addressing the following site components within the for the area of interest:
    - (A) bedrock and surficial geology (e.g. rock type, depositional environment);
    - (B) geological structure (e.g. fracture pattern, jointing, lineaments);
    - (C) soils (e.g. thickness, stratification, hydraulic properties);
    - (D) aquifer types;
    - (E) groundwater flow, including estimated recharge and discharge areas;
    - (F) all existing uses of groundwater proposed to be reclassified, including high potential risk activities and moderate potential risk activities; and
    - (G) potential sources causing or contributing to contamination.
  - (2) A sampling and monitoring plan prepared by a qualified hydrogeologist that will produce data representative of the groundwater quality conditions at and around the area of interest. The plan shall identify, at a minimum, the following:
    - (A) the number of monitoring wells that will be sampled;
    - (B) the location and depth of the monitoring wells, which shall be selected so as to be geologically and geochemically similar to the area of interest and to be unaffected by current and historic activities at the site, including by being hydrogeologically upgradient of such activities if possible;

- (C) the number and frequency of the samples to be taken from the monitoring wells and any existing sources of water for potable water supplies, public water sources, or non-potable wells or springs;
  - (D) the sampling methodology;
  - (E) the substances to be analyzed in the samples that are collected;
  - (F) the analytical methods to be used in conducting the sample analysis;
  - (G) identification of whether samples obtained prior to the approval of the monitoring plan will be used as data points and, if so, the sampling date, location, method of analysis for each of the samples to be used; and
  - (H) a quality assurance/quality control plan for sample collection, testing, and analysis.
- (3) The Secretary may request additional information from an applicant when the Secretary determines that the sampling and monitoring plan may not provide data representative of the groundwater quality at and around the area of interest.
- (b) Following the Secretary's approval of the information submitted pursuant to Subsection (a)(1) and of the sampling and monitoring plan, as well as the completion of sampling, the person seeking to establish background groundwater quality shall submit a background groundwater quality report to the Secretary. The report shall include the following:
- (1) All sampling results and data collected pursuant to the approved monitoring and sampling plan.
  - (2) An analysis of all data collected pursuant to the approved monitoring and sampling plan.
  - (3) Any discrepancies between the approved sampling and monitoring plan and the sampling completed for the area of interest.
  - (4) A proposed background groundwater concentration of all substances for which the person seeks to establish background groundwater quality and a justification for each concentration. The justification may include statistical analysis.
  - (5) Additional information the Secretary determines is necessary to approve or deny the proposed background groundwater concentrations.

- (c) Following submission of the background groundwater quality report to the Secretary, the Secretary shall approve or deny the proposed background groundwater concentrations or may establish alternative background groundwater concentrations based on the background groundwater quality report. The Secretary may consult with the groundwater coordinating committee prior to making a final determination regarding background groundwater concentrations.

## § 12-606 PREVENTIVE ACTIONS

- (a) If groundwater monitoring indicates the presence in groundwater of a substance in an amount exceeding the preventive action level at a compliance point that a permitted activity is causing or contributing to, the permittee shall, within 45 calendar days of the detection, submit to the Secretary a report that includes:
  - (1) a description of the potential sources of the substance and causes of any exceedance of the preventive action levels;
  - (2) identification of the substances detected and their detection limits;
  - (3) copies of all sampling data;
  - (4) a description of the reliability of the sampling data, including the quality of the sampling data, sampling procedures, precision and accuracy of the analytical test, size of the data set, and quality control and quality assurance procedures used;
  - (5) recommendations regarding whether any actions should be taken to prevent an exceedance of the groundwater enforcement standards at a compliance point; and
  - (6) identification of any background groundwater concentration approved by the Secretary pursuant to Section 12-605 of this Rule.
- (b) The Secretary may:
  - (1) Request additional information.
  - (2) Require the permittee to take such actions as the Secretary determines to be necessary to prevent exceedance of the groundwater enforcement standards.
- (c) In determining what actions to require, the Secretary shall consider any background groundwater concentration approved by the Secretary pursuant to Section 12-605 of this Rule.

§ 12-607      CORRECTIVE ACTIONS

(a) If groundwater monitoring indicates contamination at a compliance point that a permitted activity is causing or contributing to, the permittee shall:

- (1) Immediately notify the Secretary of the detection.
- (2) Within 10 calendar days following the detection, submit to the Secretary an initial report that includes:
  - (A) a description of the potential sources of contamination and causes of any exceedance of the groundwater enforcement standards;
  - (B) identification of the substances detected and their detection limits; and
  - (C) the known impacts on groundwater.
- (3) Within 30 calendar days, or alternative time period approved by the Secretary, following the detection, submit to the Secretary a supplemental report that includes:
  - (A) Copies of all sampling data.
  - (B) A description of the reliability of the sampling data, including the quality of the sampling data, sampling procedures, precision and accuracy of the analytical test, size of the data set, and quality control and quality assurance procedures used.
  - (C) A description of the human health and environmental impact of the detection, including the substance's mobility in the subsurface, environmental fate, risk posed by the substance, whether the substance has carcinogenic, mutagenic, or developmental toxicity properties, and whether the substance has interactive effects with other substances.
  - (D) An evaluation addressing each of the following and that the Secretary may require be completed by an independent consultant: the effectiveness of the activity as permitted, including any conditions of the permit, in preventing contamination; an evaluation of whether the activity, as designed, constructed, and operated, is performing in accordance with the permit and governing law; and an evaluation of whether design or operational changes would reduce the concentration of the substance in the groundwater.
  - (E) Identification of any background groundwater concentration approved by the Secretary pursuant to Section 12-605 of this Rule for the substance and analysis of whether background conditions are causing or contributing to the exceedance of the groundwater enforcement standards at a point of compliance.
  - (F) Identification of the presence of other potential sources of contamination.

- (G) A description of the geologic and hydrogeologic conditions at the site, including the nature, thickness, and permeability of the unconsolidated materials; the nature and permeability of the bedrock; the depth to the water table; groundwater flow gradients, both vertical and horizontal; and the position of the activity within the groundwater flow system.
  - (H) Identification of all existing uses of groundwater in the vicinity of the activity, a visual survey of uses in the vicinity of the activity, and an identification of all receptors in the vicinity of the activity that could potentially be affected.
  - (I) Identification of permitted activities in the vicinity of the activity.
  - (J) A copy of the petition to reclassify groundwater to Class IV if the person has submitted, or the Secretary has directed the person to submit, such a petition pursuant to Section 12-503 of this Rule.
  - (K) Any other information that the Secretary deems necessary to ensure an appropriate response is required for the exceedance of the groundwater enforcement standards.
- (b) Based on the nature and degree of the substance that is in exceedance of the groundwater enforcement standards, and the possible receptors of the contaminated groundwater, the Secretary may require the permittee to take immediate actions to abate the risk to human health or the environment. These actions may include ceasing the activity involved; providing alternative sources of drinking water; providing treatment for affected sources of water for potable water supplies and public water sources; conducting a response action to contain the release; installation of monitoring wells; and the collection of additional samples.
- (c) Based on an evaluation of all information available to the Secretary, including the initial and supplemental reports, the Secretary shall determine whether any response to the detection, beyond any immediate actions required pursuant to Subsection (b), is required in order to remediate the contamination to eliminate exceedances of the groundwater enforcement standards.
- (1) The Secretary may determine that the permittee is not required to undertake additional responsive actions:
- (A) if the permittee demonstrates, to the satisfaction of the Secretary, that the detection of the substance in exceedance of the groundwater enforcement standards is solely attributable to a background groundwater concentration approved by the Secretary pursuant to Section 12-605 of this Rule and that the person's actions did not cause or contribute to the detected levels; or

- (B) if the permittee demonstrates, to the satisfaction of the Secretary, that the detection is solely attributable to a source not under the control of the person and that the person's actions did not cause or contribute to the detected levels.
- (2) Unless the Secretary determines, pursuant to Subsection (c)(1), that no additional responsive actions are necessary, the Secretary shall require the permittee to implement a remediation plan with the goals of eliminating exceedances of the groundwater enforcement standards at points of compliance and enabling the groundwater to be classified as Class III.
  - (A) The Secretary may require the following actions as part of the remediation plan:
    - (i) installation of new or additional monitoring wells or alternative contaminant investigation methodologies;
    - (ii) change in the monitoring program, including increased monitoring;
    - (iii) investigation of the extent of contamination;
    - (iv) change in the operation of the activity;
    - (v) modification in the design of the activity;
    - (vi) adoption of alternate method of waste treatment or disposal;
    - (vii) ceasing of the activity or closure and abandonment of the activity;
    - (viii) implementation of corrective action to restore groundwater quality;
    - (ix) removal of contaminated soils;
    - (x) submission of appropriate permit or permit amendment applications if permits or permit amendments are required for any of these responsive actions;
    - (xi) submission of a petition to reclassify groundwater to Class IV; and
    - (xii) any other action necessary to remediate the contamination.
  - (B) The Secretary may authorize actions as part of the remediation plan that may result in continued exceedances of the groundwater enforcement standard if the Secretary determines that the action will not adversely affect an existing use of groundwater and that it is technically impractical to achieve complete remediation of the contamination.
  - (C) For activities subject to the Investigation and Remediation of Contaminated Properties Rule, the remediation plan may take the form of a corrective action plan required pursuant to 10 V.S.A. § 6615b.

- (d) If the Secretary determines that the source of the contamination and cause of the exceedance of the groundwater enforcement standard is an action not subject to this Rule, the Secretary shall:
  - (1) Notify the appropriate local, State, or Federal authorities of the action and submit evidence demonstrating the action is causing or contributing to the exceedance.
  - (2) Cooperate with the appropriate local, State, or Federal Authorities in determining the appropriate response.
- (e) Notwithstanding the timeframes established by this Section, the Secretary and the person responsible for the activity may agree on an alternative timeframe for the submittal of a report.



## APPENDIX ONE

Table 1: Groundwater Enforcement Standards, Vermont Action Levels, and Preventive Action Levels

**Bolded values** indicate values that have been revised or added since the December 16, 2016 Groundwater Protection Rule and Strategy.

Substance	CAS No.	Groundwater Enforcement Standard $\mu\text{g/L}^{(a)}$	Vermont Action Level $\mu\text{g/L}^{(a)}$	Preventive Action Level $\mu\text{g/L}^{(a)}$
Acetone	67-64-1	<b>950</b>		<b>475</b>
Alachlor	15972-60-8	2		<b>0.2</b>
Aldicarb	116-06-3	<b>1<sup>(b)</sup></b>		<b>1<sup>(c)</sup></b>
Aldicarb sulfone	1646-88-4	<b>1<sup>(b)</sup></b>		<b>1<sup>(c)</sup></b>
Aldicarb sulfoxide	1646-87-3	<b>1<sup>(b)</sup></b>		<b>1<sup>(c)</sup></b>
Aldrin	309-00-2	<b>0.1</b>		<b>0.1</b>
Aminoethyl ethanolamine (AEEA)	111-41-1	<b>20</b>		<b>2</b>
Ammonium sulfamate	7773-06-0	<b>914</b>		<b>457</b>
Anthracene	120-12-7	<b>343</b>		<b>171</b>
Antimony	7740-36-0	6		3
Arsenic	7440-38-2	10		1
Asbestos	1332-21-4	7E+6 fibers/L (longer than 10 $\mu\text{m}$ )		7E+5 fibers/L (longer than 10 $\mu\text{m}$ )
Atrazine	1912-24-9	3		2
Barium	7440-39-3	2000		1000
Bendiocarb	<b>22781-23-3</b>	<b>2</b>		<b>1</b>

Substance	CAS No.	Groundwater Enforcement Standard  µg/L <sup>(a)</sup>	Vermont Action Level  µg/L <sup>(a)</sup>	Preventive Action Level  µg/L <sup>(a)</sup>
<b>Benomyl</b>	<b>17804-35-2</b>	<b>10</b>		<b>1</b>
Benzene	71-43-2	5	0.5	0.5
Benzo(a)pyrene	50-32-8	0.2		0.1
Beryllium	7440-41-7	4		1
Beta particle and photon radioactivity	N/A	4 millirems/yr		50 pCi/L <sup>(d)</sup>
<b>Bis(2-chloro-1-methyl ethyl) ether</b>	<b>108-60-1</b>	<b>46</b>		<b>5</b>
<b>Boron</b>	<b>7440-42-8</b>	<b>870</b>		<b>87</b>
<b>Bromacil</b>	<b>314-40-9</b>	<b>111</b>		<b>11</b>
<b>Bromochloromethane</b>	<b>74-97-5</b>	<b>8</b>		<b>0.8</b>
<b>Bromomethane (Methyl bromide)</b>	<b>74-83-9</b>	<b>5</b>		<b>0.5</b>
<b>Butylate</b>	<b>2008-41-5</b>	<b>114</b>		<b>57</b>
<b>Cadmium</b>	<b>7440-43-9</b>	<b>5</b>		<b>1</b>
Carbofuran	1563-66-2	40		20
Carbon tetrachloride	56-23-5	5	0.5	0.5
<b>Chloramben</b>	<b>133-90-4</b>	<b>69</b>		<b>34</b>
Chlordane	12789-03-6	2		0.44
<b>Chlorine</b>	<b>7782-50-5</b>	<b>4000</b>		<b>2000</b>
Chlorobenzene	108-90-7	100		50
Chlorpyrifos	2921-88-2	20		10
Chromium (total)	7440-47-3	100		50
Copper	7440-50-8	1300		650

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Cyanazine	21725-46-2	1		0.5
Cyanide	143-33-9	200		100
Dalapon	75-99-0	200		100
Dazomet	533-74-4	88		44
Di(2-ethylhexyl)adipate	103-23-1	400		200
Di(2-ethylhexyl)phthalate	117-81-7	6		3
Diazinon	333-41-5	0.6		0.3
Dibromochloropropane	96-12-8	0.2	0.02	0.02
Dichlorobenzene (meta)	541-73-1	600		300
Dichlorobenzene (ortho)	95-50-1	600		300
Dichlorobenzene (para)	106-46-7	75		38
Dichloroethane (1,1)	75-34-3	70		35
Dichloroethane (1,2)	107-06-2	5	0.5	0.5
Dichloroethene (1,1)	75-35-4	7		0.7
Dichloroethene (cis-1,2)	156-59-2	70		35
Dichloroethene (trans-1,2)	156-60-5	100		50
Dichlorophenoxyacetic acid (2,4)	94-75-7	70		7
Dichloroprop	120-36-5	140		14
Dichloropropane (1,2)	78-87-5	5	0.5	0.5
Dieldrin	60-57-1	0.02		0.02
<b>Diethylenetriamine (DETA)</b>	<b>111-40-0</b>	<b>5154</b>		<b>515</b>

Substance	CAS No.	Groundwater Enforcement Standard  µg/L <sup>(a)</sup>	Vermont Action Level  µg/L <sup>(a)</sup>	Preventive Action Level  µg/L <sup>(a)</sup>
Dimethrin	70-38-2	2000		1000
Dinoseb	88-85-7	7		0.7
<b>Dioxane (1,4)</b>	<b>123-91-1</b>	<b>0.3</b>		<b>0.3</b>
Diphenamid	957-51-7	200		100
Diquat	85-00-7	20		10
Disulfoton	298-04-4	0.3		0.03
Diuron	330-54-1	10		5
Endothall	145-73-3	100		50
Endrin	72-20-8	2		1
<b>Erioglaucine</b>	<b>2650-18-2</b>	<b>7211</b>		<b>3606</b>
Ethylbenzene	100-41-4	700		350
Ethylene dibromide	106-93-4	0.05		0.01
Fenamiphos	22224-92-6	2		1
<b>Fluoranthene</b>	<b>206-44-0</b>	<b>46</b>		<b>23</b>
<b>Fluorene</b>	<b>86-73-7</b>	<b>46</b>		<b>23</b>
Fluoride	7681-49-4	4000		2000
Fonofos	944-22-9	10		5
Formaldehyde	50-00-0	1000		100
<b>Glyphosate</b>	<b>1071-83-6</b>	700		<b>70</b>
Gross Alpha (adjusted) <sup>(e)</sup>	NA	15 pCi/L		5 pCi/L
Halofenozide	112226-61-6	46		23

Substance	CAS No.	Groundwater Enforcement Standard  µg/L <sup>(a)</sup>	Vermont Action Level  µg/L <sup>(a)</sup>	Preventive Action Level  µg/L <sup>(a)</sup>
Heptachlor	76-44-8	0.4		0.088
Heptachlor epoxide	1024-57-3	0.2		0.06
<b>Hexachlorobenzene</b>	118-74-1	1	<b>0.1</b>	<b>0.1</b>
Hexachlorocyclopentadiene	77-47-4	50		25
<b>Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)</b>	<b>121-82-4</b>	<b>0.3</b>		<b>0.3</b>
Lead	7439-92-1	15		2
Lindane	58-89-9	0.2		0.1
Maneb	12427-38-2	35		18
<b>Manganese</b>	<b>7439-96-5</b>	<b>300</b>		<b>150</b>
Mercury (inorganic)	7487-94-7	2		0.5
Methoxychlor	72-43-5	40		4
<b>Methyl ethyl ketone</b>	<b>78-93-3</b>	<b>511</b>		<b>255</b>
Methyl parathion	298-00-0	2		1
<b>Methyl tert butyl ether (MTBE)</b>	<b>1634-04-4</b>	<b>11</b>		<b>5</b>
Methylene chloride	75-09-2	5		0.5
Metolachlor	51218-45-2	70		35
<b>Molybdenum</b>	<b>7439-98-7</b>	<b>6</b>		<b>3</b>
<b>Naphthalene</b>	<b>91-20-3</b>	<b>0.5</b>		<b>0.5</b>
Nickel	7440-02-0	100		50
Nitrate (as N)	14797-55-8	10000		5000

<b>Substance</b>	<b>CAS No.</b>	<b>Groundwater Enforcement Standard</b>	<b>Vermont Action Level</b>	<b>Preventive Action Level</b>
		<b>µg/L<sup>(a)</sup></b>	<b>µg/L<sup>(a)</sup></b>	<b>µg/L<sup>(a)</sup></b>
Nitrates/Nitrites (total)	NA	10000		5000
Nitrite (as N)	14797-65-0	1000		500
<b>O-Phenylphenol</b>	<b>90-43-7</b>	<b>764</b>		<b>76</b>
<b>Octahydro-1,3,5,7-tetranitro- 1,2,3,5,7- tetrazocine (HMX)</b>	<b>2691-41-0</b>	<b>57</b>		<b>29</b>
Oxamyl	23135-22-0	200		100
Paraquat	1910-42-5	30		3
<b>Pentachlorophenol</b>	<b>87-86-5</b>	<b>1</b>	<b>0.1</b>	<b>0.1</b>
<b>Pentaerythriol tetranitrate (PETN)</b>	<b>78-11-5</b>	<b>2</b>		<b>1</b>
<b>Perchlorate</b>	<b>1479-73-0</b>	<b>2</b>		<b>1</b>
<b>Perfluorohexane sulfonic acid (PFHxS)</b>	<b>355-46-4</b>	<b>0.02<sup>(f)</sup></b>		<b>0.002<sup>(g)</sup></b>
<b>Perfluoroheptanoic acid (PFHpA)</b>	<b>375-85-9</b>	<b>0.02<sup>(f)</sup></b>		<b>0.002<sup>(g)</sup></b>
<b>Perfluorononanoic acid (PFNA)</b>	<b>375-95-1</b>	<b>0.02<sup>(f)</sup></b>		<b>0.002<sup>(g)</sup></b>
<b>Perfluorooctanesulfonic acid (PFOS)</b>	<b>1763-23-1</b>	<b>0.02<sup>(f)</sup></b>		<b>0.002<sup>(g)</sup></b>
<b>Perfluorooctanoic acid (PFOA)</b>	<b>335-67-1</b>	<b>0.02<sup>(f)</sup></b>		<b>0.002<sup>(g)</sup></b>
Picloram	1918-02-1	500		250
Polychlorinated Biphenyls	1336-36-3	0.5		0.25
Propachlor	1918-16-7	90		45
Propham	122-42-9	100		50

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Radium226 & 228	7440-14-4	5 pCi/L		0.5 pCi/L
<b>Radon</b>	<b>010043-92-2</b>	<b>4000 pCi/L</b>		<b>400 pCi/L</b>
Selenium	7782-49-2	50		25
Simazine	122-34-9	4		2
<b>Styrene</b>	<b>100-42-5</b>	100		<b>10</b>
<b>Tall oil hydroxyethyl imidazoline</b>	<b>61791-39-7</b>	<b>118</b>		<b>59</b>
<b>Tartrazine</b>	<b>1934-21-0</b>	<b>1905</b>		<b>952</b>
Tetrachlorodibenzo-p-dioxin (2,3,7,8)	1746-01-6	3.00E-05		1.10E-05
Tetrachloroethane (1,1,1,2)	630-20-6	70		35
Tetrachloroethylene	127-18-4	5	1	0.5
Thallium	7440-28-0	2		1
Toluene	108-88-3	1000		500
Toxaphene	8001-35-2	3		2
<b>Trichlorobenzene (1,2,3)</b>	<b>87-61-6</b>	<b>0.9</b>		<b>0.5</b>
Trichlorobenzene (1,2,4)	120-82-1	70		35
Trichloroethane (1,1,1)	71-55-6	200		100
Trichloroethane (1,1,2)	79-00-5	5		3
Trichloroethylene	79-01-6	5	0.5	0.5
Trichlorophenoxyacetic acid (2,4,5)	93-76-5	70		7
Trichlorophenoxypropionic acid (2,4,5)	93-72-1	50		25

<b>Substance</b>	<b>CAS No.</b>	<b>Groundwater Enforcement Standard</b> <b>µg/L<sup>(a)</sup></b>	<b>Vermont Action Level</b> <b>µg/L<sup>(a)</sup></b>	<b>Preventive Action Level</b> <b>µg/L<sup>(a)</sup></b>
<b>Trichloropropane (1,2,3)</b>	<b>96-18-4</b>	<b>0.02</b>		<b>0.02</b>
<b>Triclopyr</b>	<b>55335-06-3</b>	<b>165</b>		<b>83</b>
<b>Trimethyl benzene (1,2,3) (1,2,3-TMB)</b>	<b>526-73-8</b>	<b>23<sup>(h)</sup></b>		<b>2<sup>(i)</sup></b>
<b>Trimethyl benzene (1,2,4) (1,2,4-TMB)</b>	<b>95-63-6</b>	<b>23<sup>(h)</sup></b>		<b>2<sup>(i)</sup></b>
<b>Trimethyl benzene (1,3,5) (1,3,5-TMB)</b>	<b>108-67-8</b>	<b>23<sup>(h)</sup></b>		<b>2<sup>(i)</sup></b>
<b>Trinitrotoluene (2,4,6) (TNT)</b>	<b>118-96-7</b>	<b>0.8</b>		<b>0.3</b>
Uranium	7440-61-1	20		2
Vinyl chloride	75-01-4	2	0.5	0.5
Xylenes	1330-20-7	10000		5000
Zineb	142-14-3	350		175

**Notes:**

- (a) All units are micrograms per Liter (µg/L) (i.e., parts per billion (ppb)), unless otherwise noted.
- (b) Groundwater Enforcement Standard of 1 µg/L for any combination of Aldicarb, Aldicarb sulfone and Aldicarb sulfoxide.
- (c) Preventive Action Level of 1 µg/L for any combination of Aldicarb, Aldicarb sulfone and Aldicarb sulfoxide.
- (d) Notwithstanding Section 12-602(1) and (2), the Preventive Action Level is based on the Safe Drinking Water Act monitoring requirements, not as a percentage of the Groundwater Enforcement Standard. See 40 C.F.R. §§ 141.16 and 141.26.
- (e) Adjusted Gross Alpha excludes Uranium and Radon.
- (f) Groundwater Enforcement Standard of 0.02 ug/L for any combination of PFOA, PFOS, PFHxS, PFHpA, and PFNA.



- (g) Preventive Action Level of 0.002 ug/L for any combination of PFOA, PFOS, PFHxS, PFHpA, and PFNA.
- (h) Groundwater Enforcement Standard of 23 ug/L for any combination of 1,2,3-TMB, 1,2,4-TMB, and 1,3,5-TMB isomers.
- (i) Preventive Action Level of 2 ug/L for any combination of 1,2,3-TMB, 1,2,4-TMB, and 1,3,5-TMB isomers.