

- (26) “Non-aqueous phase liquid” or “NAPL” means a liquid solution contaminant that does not dissolve in or easily mix with water, such as oil, gasoline, coal tar, or chlorinated solvents. A NAPL may be denser than water, sinking below the water table, or lighter than water, floating on the water table
- (27) “Non-hazardous waste contaminated soil” means soils that are contaminated with hazardous materials at concentrations above the Soil Screening Values but that are not themselves hazardous wastes under the Vermont Hazardous Waste Management Rule.
- (28) “Polyencapsulation” means the treatment of petroleum contaminated soil by stockpiling on plastic sheeting and covering the stockpile with plastic sheeting.
- (29) “Potentially Responsible Party” or “PRP” means any individual or organization, potentially liable under 10 V.S.A. §6615.
- (30) “Receiving site” means a location approved by the Secretary where excavated development soils are disposed in accordance with this rule.
- (31) “Recognized environmental condition” means the presence or likely presence of a hazardous material at a property:
 - (A) due to a release;
 - (B) under conditions indicative of a release to the environment; or
 - (C) under conditions that pose a material threat of a future release to the environment.
- (32) “Release” means any intentional or unintentional action or omission resulting in the spilling, leaking, pumping, pouring, emitting, emptying, dumping, discharging, or disposing of hazardous materials onto or into the lands of the state or into groundwater, or into waters outside the jurisdiction of the State when damage may result to the human health, lands, waters, or natural resources within the jurisdiction of the State.
- (33) “Residual contamination” means hazardous material that remains in environmental media after a release has occurred and corrective action has ceased.
- (34) “Secretary” means the Secretary of the Vermont Agency of Natural Resources or the Secretary’s duly authorized representative.
- (35) “Sensitive receptor” means any natural or human-constructed feature that may be adversely affected by a hazardous material and includes public health, public water sources, sources of water for potable water supplies, groundwater, surface waters, wetlands, soils, sensitive ecological areas, outdoor and indoor air, and enclosed spaces such as basements, sewers, and subsurface utilities.
- (36) “Site” means the area where a release is known or suspected to have occurred, including the extent of contamination resulting from the release. A site is not limited by legal property boundaries.
- (37) “Spill” means a release which can be investigated and remediated within a short time frame and where long term management is not expected or required.
- (38) “Substantial completion” means:
 - (A) the site is enrolled in the BRELLA program; and
 - (B) the property has a remediation system constructed in accordance with an approved corrective action plan; and

- (i) the remediation system is operating as designed following implementation of corrective action;
 - (ii) the institutional controls for the property have not been finalized; or
 - (iii) long term monitoring is necessary to determine whether remedial objectives are being achieved.
- (39) “Surface water” includes 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.
- (40) “Surface soil” means soil present at 0-6 inches below ground surface.
- (41) “Survey benchmark” means a feature on a site to which the surveyed elevation of all monitoring wells and site features are referenced. Survey benchmarks must be a fixed, permanent, and readily identifiable. The use of monitoring wells as survey benchmarks is prohibited. The site survey benchmark must be accurately depicted on all Site drawings, figures, maps, etc. that present site features or data in plan view.
- (42) “Suspected release” means when there is knowledge, information, or evidence that a release has likely occurred. In addition, an exceedance of an environmental media standard shall be presumed to be a suspected release and shall be reported pursuant to § 35-102(b).
- (43) “Underground Storage Tank” or “UST” means one or a combination of underground tanks including underground pipes connected to it or them, which is or has been used to contain a hazardous material, and the volume of which, including the volume of the underground pipes connected to it or them, is 10 percent or more beneath the surface of the ground.
- (44) “US EPA” means United States Environmental Protection Agency.
- (45) “Vapor intrusion” means the migration of volatile chemicals from contaminated environmental media, a building, subsurface conduit or structure.
- (46) “Volatile Organic Compound (VOC) field screening instrument” means a photoionization detector, flame ionization detector, field portable gas chromatograph/mass spectrometer or another portable instrument approved by the Secretary as a part of a work plan.
- (47) “Water table” means the top of the saturated zone where the fluid pressure equals the atmospheric pressure.

SUBCHAPTER 3. SITE INVESTIGATION

§ 35-301. Requirement to Perform Site Investigation.

- (a) Unless an action is taken as an emergency response pursuant to § 35-102(c) or has been investigated as a heating oil fuel release and has satisfied the Secretary's requirements under Subchapter 4, a person who may be liable for the release or suspected release of a hazardous material as established in 10 V.S.A. 6615 shall conduct a site investigation in accordance with the requirements of this chapter.
- (b) A PRP shall provide the Secretary with a site investigation work plan within 30 days of the release or discovery of the release. The Secretary may establish, in writing, an alternative timeframe for providing a work plan.

§ 35-302. Conceptual Site Model

- (a) The CSM shall be developed during the preparation of the investigation workplan required by § 35-303.
- (b) The CSM shall identify the following or identify how the information will be obtained in the context of the site investigation:
 - (1) Source of the release;
 - (2) The characteristics of engineered structures, subsurface infrastructure, tanks and containers present or known or suspected to have been present at the site, from which or through which the suspected contaminants may have been released, transported, or may impact a sensitive receptor;
 - (3) Historical land uses;
 - (4) Sources and contaminants;
 - (A) Identify all potential hazardous materials and all potential and actual sources of a release;
 - (B) Identify all hazardous material phases (e.g. NAPL, sorbed to matrix, dissolved in groundwater or soil moisture, and in vapors in the vadose zone);
 - (C) Identify all hazardous material physical properties; and
 - (D) If known, an estimate of the amount of hazardous material mass on the Site.
 - (5) Geology. A brief description of regional and site-specific soils and bedrock. Boring logs, well logs and groundwater confining layers shall be included, if available. If applicable, values for soil bulk density, porosity, fraction organic content, pH and reduction-oxidation potential, shall be included. If available include geologic maps, fracture trace maps, geophysical data, and cross sections;
 - (6) Hydrogeology. Describe regional and site specific hydrogeology, horizontal and vertical groundwater flow gradients and direction, and an assessment of the potential for preferential pathways and multiple aquifers. If available, hydraulic conductivity, transmissivity, and other parameters shall be included;
 - (7) Contaminant fate and transport. Describe the hazardous material distribution, migration pathways, the amount of migration occurring, the predicted migration of the contamination over time, and if available, the adsorption, desorption, absorption, and retardation of the hazardous material, and naturally occurring degradation processes. If historic groundwater quality data have been collected, estimate the duration of groundwater contamination to determine if groundwater reclassification is warranted according to the Groundwater Protection Rule and Strategy;

- (8) Receptor Study and Evaluation. Identify all potentially threatened sensitive receptors and complete exposure pathways. A list of the names and addresses of impacted or threatened third parties must be included, if applicable. Compare all measured concentrations of hazardous materials with applicable environmental media standards; and
- (9) Potential exposure pathways from all potentially impacted media including direct contact, ingestion, vapor intrusion, and any other identified exposure pathway.

§ 35-303. Site Investigation Work Plan

- (a) Applicability. This section applies to any release that is not fully investigated pursuant to:
 - (1) § 35-102(c) (emergency response); or
 - (2) Subchapter 4 (response action; heating fuel).
- (b) Purpose and objectives of a site investigation work plan are to:
 - (1) Identify the source, degree, and spatial extent of contamination in all impacted or potentially impacted environmental media;
 - (2) Identify pathways that are conveying or could convey hazardous materials to different sensitive receptors;
 - (3) Identify sensitive receptors that have been or may be impacted by the release based upon an evaluation of pathways;
 - (4) Identify the need to conduct further investigation or corrective action based on results of site characterization data gathered to date;
 - (5) Develop the Conceptual Site Model in accordance with §35-302; and
 - (6) Identify data gaps that must be addressed to confirm the site conceptual model or evaluate corrective actions.
- (c) General requirements.
 - (1) A site investigation work plan shall be submitted to the Secretary no later than 30 days of the date the Secretary was notified of a release, unless the Secretary agrees to an alternate schedule.
 - (2) A site investigation work plan shall be approved by the Secretary prior to the initiation of on-site work.
- (d) Minimum content. A site investigation shall, at a minimum, include:
 - (1) Site information. Table of names, addresses, email addresses and phone numbers of the following:
 - (A) Property owner and operator,
 - (B) Any person or entity who released a hazardous material at the site
 - (2) Current use or uses of the property;
 - (3) Uses of properties adjacent to the site;
 - (4) Site description. A physical and environmental description of the site;
 - (5) Site characterization strategy. This strategy shall address known data gaps and include contaminant characterization methods, sampling locations and methods, and the rationale for that strategy;
 - (6) Identification of analytical methods;
 - (7) A list of consultant standard operating procedures to be used during the site investigation, which must be submitted to the Secretary upon request;
 - (8) A CSM and a description on how the site investigation will gather information to further develop and refine the CSM;

- (9) A discussion of how investigation-derived waste will be managed, which must be in accordance with §35-505(a)(5)(C);
- (10) A quality assurance and quality control (QA/QC) plan;
- (11) Maps. At a minimum, a vicinity map in accordance with §35-305(b)(12)(A) and a site map in accordance with §35-305(b)(12)(B) showing proposed environmental media sampling locations shall be included;
- (12) Latitude/longitude of the site, as close as possible to the known or suspected release location or locations, referenced to the WGS1984 coordinate system (Mercator), in decimal degrees. Minimum acceptable accuracy is plus-or-minus 15 feet;
- (13) A site investigation work plan implementation schedule; and
- (14) Signature. A site investigation work plan shall be signed by the Environmental Professional in accordance with § 35-104.

§ 35-304. Site Investigation Work Plan; Secretary Review and Determination

- (a) The Secretary shall only approve, in writing, a site investigation work plan upon finding the investigation will:
 - (1) Aid in determining the degree and extent, and fate and transport of contamination at the Site; and
 - (2) Characterize any threat that may exist to a sensitive receptor.
- (b) A PRP shall implement an approved site investigation work plan no later than 60 days from the date of the Secretary's approval, unless an alternate implementation timeline is approved by the Secretary.

§ 35-305. Site Investigation Report

- (a) The site investigation report must be submitted to the Secretary within 90 days of receipt of final laboratory data, or within an alternate schedule approved by the Secretary.
- (b) A site investigation report shall include the following:
 - (1) Executive summary. A site investigation report shall include an executive summary of the site investigation, consisting of a summary of findings, conclusions, and recommendations based on the data collected during the site investigation.
 - (2) Site information. Table of names, addresses email addresses and phone numbers of the following:
 - (A) Property owner and operator; and
 - (B) Any person who released a hazardous material at the site.
 - (3) Current use or uses of the property.
 - (4) Uses of properties adjacent to the site.
 - (5) Site description. A physical and environmental description of the site.
 - (6) Latitude/longitude of the site, as close as possible to the known or suspected release location or locations, referenced to the WGS1984 coordinate system (Mercator), in decimal degrees. Minimum acceptable accuracy is plus-or-minus 15 feet.
 - (7) Property history. Past and present land use, waste storage or disposal areas, potential sources of contamination, and hazardous waste and hazardous materials disposal practices, including any associated EPA ID numbers. The property history section shall include a description of current and historic property uses in the surrounding area. A list of all recognized environmental conditions should be provided if an ASTM Phase I or Phase II Environmental Site Assessment has been completed.

Presentation may include copies of historic maps (including Sanborn Fire Insurance Maps, town maps) and copies of town directories.

- (8) Site contaminant background. A description of all known releases of hazardous materials, including the following information:
 - (A) The date and a description of each release, if known, the discovery date of each release, the location of each release, and the PRP for each release;
 - (B) The date each release was reported to the Secretary;
 - (C) A description of response actions taken for each release;
 - (D) A list of any previous environmental investigations and reports (including Phase I Environmental Site Assessments) pertinent to the Site relating to a release of hazardous materials, including a summary of findings;
 - (E) A copy of any previous investigation or report relating to a release of hazardous materials, if not already on file with the Secretary; and
 - (F) A list of governmental records reviewed relating to the Site.
- (9) Work plan protocol deviations. Any deviations from the approved work plan must be identified and discussed.
- (10) Sample-collection documentation. Documentation of the sample location and method of collection in accordance with the approved work plan.
- (11) Contaminated media characterization. Analytical results must be tabulated and compared to the applicable environmental media standard in Appendix A and the following:
 - (A) Soil. Soil samples must be compared to EPA Regional Screening Levels target cancer risk $1E-06$ or Hazard Quotient of 1.0 for single contaminant detected that is regulated and from the release. If multiple regulated contaminants are detected from the release and are above respective RSL then samples must be compared to Vermont Department of Health Risk Based Screening Concentrations, if available. See Appendix A.
 - (B) Groundwater. Sample results must be compared to the Vermont Groundwater Enforcement Standards.
 - (C) Drinking water. Sample results must be compared to the applicable Vermont Health Advisory, Vermont Action Levels, or EPA Maximum Contaminant Levels (MCLs).
 - (D) Surface water. Sample results must be compared to the Vermont Water Quality Standards.
 - (E) Sediment. Sample results must be compared to the Threshold Effect Concentration (TEC) and Probable Effects Concentration (PEC) for sediments.
 - (F) Soil gas and indoor air. Soil gas and indoor air must be compared to the most recent EPA Vapor Intrusion Screening Value, EPA Regional Screening Levels or the Vermont Department of Health Risk Based Residential and Worker Air Screening Level where available. See Appendix A.
 - (G) Any site-specific health advisory, Soil Screening Value, developed by the Vermont Department of Health when a standard does not exist for a hazardous material.
- (12) Maps. All maps shall include the location of the Site, physical and environmental features, the Vermont Department of Environmental Conservation Hazardous Site

number, legend, graphical scale bar, and a base map source reference. All maps must be accurate and to scale. The following maps shall be included:

- (A) Vicinity map (or sensitive receptor map). Prepared using the Vermont Agency of Natural Resources online Natural Resource Atlas, Waste Management Theme as a base map including property boundary lines, surrounding land use, buildings, street names, sensitive receptors identified in § 35-302(b)(8), surface water bodies, chemical storage or process areas, waste storage and disposal areas, floor drains, drywells and hazardous materials within 1,000 feet of the site.
 - (B) Site map. A site investigation map shall include:
 - (i) surface topography spot elevations or contours;
 - (ii) property boundary lines;
 - (iii) environmental media sample locations;
 - (iv) contaminant source areas, including former or current tank locations, release areas, or waste disposal locations;
 - (v) engineered structures, including asphalt parking surfaces, concrete sidewalks, drainage ways, diversion ditches, drain tiles, manholes, lined areas, leachate collection systems, septic systems, sewer lines, drywells; and
 - (vi) site benchmark. A permanent and recoverable site feature shall be assigned as the Site benchmark. The use of the top of monitoring well risers, road box covers, or concrete pads as a benchmark is prohibited.
 - (C) Groundwater flow direction map. The groundwater flow direction map shall include the location of all monitoring points and data collected to create groundwater elevation contours. Multiple maps may be needed to show groundwater flow in different aquifers. A groundwater flow direction map will not be required if the site investigation did not include the installation of groundwater monitoring wells.
 - (D) Contaminant distribution map. A contaminant distribution map shall include the location of all monitoring points and, as required by the Secretary, concentration of any hazardous material at that monitoring point. As applicable, based on the site-specific geology and distribution of contaminants, isopleths shall be used to indicate the approximate location of compound-specific contaminant plumes that exceed the applicable environmental media standard. Multiple maps may be required to illustrate multiple contaminants or multiple aquifers. Maps solely depicting total contaminants (e.g. total VOCs) will not be accepted. At sites where isopleth maps are not appropriate, contaminant concentrations will be plotted on the maps adjacent to the sampling points.
- (13) Discussion. The discussion shall include a descriptive analysis of how the data gathered further refines the CSM, how the CSM has been updated, and how the site investigation work plan objectives in § 35-303(b) have been met. The discussion shall also establish that the data collected are suitable to determine the existing and future exposure to sensitive receptors and, the need for further characterization. Only data that meets quality assurance quality control (QA/QC) criteria will be accepted. A

discussion of data which doesn't meet QA/QC criteria must be included. The report shall evaluate if the data demonstrates that groundwater contamination is confined to the same property where the release occurred and if not, if it will recede to the property boundary within five years from completion of the site investigation.

- (14) Data presentation. All collected data shall be organized in a narrative, tabular, and graphical form, data shall be presented on maps and cross sections when appropriate. All detected hazardous material concentrations shall be reported. Detection limits shall be provided along with analytical results. Hazardous materials that are not detected shall be reported as non-detect. Detection limits shall be below the environmental media standards.
- (15) QA/QC sample results. At a minimum, a trip blank, a method blank and a duplicate sample will be required. If field analytical methods are approved in the work plan, the Secretary may require that a subset of samples be analyzed at a fixed base laboratory. Additional QA/QC samples (e.g. field blanks) may be required by the Secretary depending on the complexity of the investigation or sampling methods used. Any deviations from QA/QC procedures or acceptable limits must be identified and discussed.
- (16) Investigation-derived waste. All investigation derived waste generated during the site investigation must be managed in accordance with § 35-505(a)(5)(C). A discussion of how the investigation derived waste was managed shall be included in the site investigation report.
- (17) Conclusions and recommendations. The site investigation report shall include a discussion of the findings of the investigation that substantiate the revised CSM, and, specifically, the risk that hazardous materials pose to identified sensitive receptors. Further this section shall identify completed exposure pathways, data gaps, and potential corrective actions. The PRP shall make recommendations on proposed monitoring and frequency and need for further investigation, corrective action, or site closure. If additional data collection is necessary in order to identify an appropriate corrective action, then additional site investigation will be required.
- (18) Signature and certification. A site investigation report shall be certified by the environmental professional that it was conducted in accordance with the approved workplan and signed in accordance with § 35-104.
- (19) Standard operating procedures. A list of consultant standard operating procedures (SOPs) that were used during site investigation shall be listed in the report and provided to the Secretary upon request.
- (20) Appendices.
 - (A) Monitoring well and soil boring logs. At a minimum, logs shall include a description and discussion of monitoring well, soil boring and test pit installation. Logs shall include well boring or test pit location with latitude and longitude. In addition, logs shall include the installation method, blow count data, elevation, total depth, depth to groundwater, soil or rock descriptions, well construction, hole backfill, or sealing information, odors noted, and field screening results.
 - (B) Photographic documentation. Color images showing work performed at the site (UST closure, soil stockpiles, etc.) and pertinent site or vicinity features shall be included as an appendix. Each photographic presentation shall include the date and time, location, and orientation.

- (C) Field notes. Copies of the original field notes shall be attached as an appendix and the field notes shall contain the following minimum content: the date the work was performed, name of the person conducting the work, tasks completed, date, documentation of weather conditions, sampling timeline with locations, sampling logs, field monitoring results, and calibration information for each type of field analytical equipment.
- (D) Laboratory results. A copy of the laboratory results, chains of custody documentation and all QA/QC data, as specified in the approved work plan must be included.
- (E) Calculations. All calculations, such as contaminant mass or volume, travel and migration time, natural attenuation, and groundwater gradients. If computer modeling is conducted, a reference to the model used, the data inputs, and data output package must be included.
- (F) Hydrogeologic cross sections. When requested by the Secretary or approved in a work plan.

§ 35-306. Review of Site Investigation Report

- (a) The Secretary shall review the site investigation report for completeness with the requirements of 35-305(b)
- (b) After determining that the site investigation report contains all the information required in §35-305(b), the Secretary shall, in writing notify the PRP:
 - (1) The site investigation report has adequately defined the scope and extent of contamination and risks to sensitive receptors have been appropriately managed. The site is potentially eligible to be closed in accordance with § 35-701.
 - (2) The site investigation report has not adequately defined the scope and extent of contamination or risk to sensitive receptors and the PRP shall submit a supplemental site investigation work plan to address data gaps or other deficiencies identified by the Secretary; or
 - (3) The site investigation report has not met the objectives in the approved workplan or is incomplete, and will be returned to the PRP for revisions and resubmittal; or
 - (4) The site investigation report has adequately defined the scope and extent of contamination but risks to sensitive receptors have not been appropriately managed. The PRP shall develop a corrective action plan in accordance with Subchapter 5.

SUBCHAPTER 4. RESPONSE ACTIONS; RELEASES OF HEATING FUELS

§ 35-401. Applicability.

This subchapter applies to the release of heating fuel from a category 4 UST used for storage of heating fuel.

§ 35-402. Investigation; Soil Removal and Drinking Water.

- (a) Soil removal. Following approval from the Secretary, a PRP shall remove impacted soil in the area where a release of heating oil occurred until VOC field screening instrument readings are below 10 ppmv. If removal of soil is not possible due to physical constraints, the PRP shall:

- (1) Collect and analyze a soil sample of soils remaining in place from the area determined to be the most contaminated by field measurements; and
 - (2) If groundwater is encountered, collect and analyze a groundwater sample from the excavation area.
- (b) Bedrock. Soil excavation shall be extended to the soil bedrock interface to determine if impacted soil is present unless:
- (1) the vertical extent of contaminated soil is delineated and determined to be adequately separated from the bedrock surface; or
 - (2) excavation to bedrock is physically impossible or a confining soil layer is present, in which case the PRP shall collect a water sample from all drinking water supply wells drilled into bedrock within 200 feet of the release.
- (c) Drinking water. If a drinking water supply well is located anywhere on the property or an off-site property within 200 feet of the release, a sample must be collected from the water source for appropriate laboratory analysis.
- (d) Vapor intrusion. If there is any building within 30 feet of the release, indoor air must be screened with a VOC field screening instrument.
- (e) Surface waters. If visual observations or VOC field screening instrument readings indicate that a release may have impacted surface water then the PRP shall immediately take measures to abate any continuing release to surface water and remove to the extent possible any product in the water.

§ 35-403. Investigation and Soil Removal Report.

Within 30 days of receipt of laboratory data, or an alternate timeframe approved in writing by the Secretary a PRP shall provide the Secretary a report that contains the following:

- (1) Site description, in accordance with § 35-305(b)(5);
- (2) Property history, in accordance with § 35-305(b)(7);
- (3) Results of contaminated environmental media characterization, in accordance with § 35-305(b)(11);
- (4) Maps, in accordance with § 35-305(b)(12)(A) and 35-305(b)(12)(B);
- (5) Data presentation, in accordance with § 35-305(b)(14);
- (6) Conclusions and recommendations, in accordance with §35-305(b)(17);
- (7) Photographic documentation in accordance with §35-305(b)(20)(B);
- (8) Copies of laboratory reports, in accordance with §35-305(b)(20)(D);
- (9) Waste disposal documentation, in accordance with § 35-505(a)(5)(C) and 35-507(b)(14); and
- (10) Recommendations for closure or additional release characterization.

§ 35-404. Response to Report.

The Secretary shall respond, in writing, to the investigation and reporting required by this section, as follows:

- (1) No further work is required;
- (2) An additional site investigation in accordance with 35-405 is necessary;
- (3) A site investigation in accordance with Subchapter 3 or corrective action in accordance with Subchapter 5 is required; or
- (4) The report is incomplete and will be returned to the PRP and the environmental professional for revision and resubmission.

§ 35-405. Additional Site Investigation.

- (a) If required by the Secretary under § 35-404(2) of this section, a PRP shall prepare an additional site investigation work plan and provide it to the Secretary for review and approval prior to implementation. At a minimum, the additional site investigation work plan shall include:
- (1) Soil borings and soil samples.
 - (A) Soil borings shall be advanced to below the water table within the former UST location or AST release area and in the downgradient direction.
 - (B) A representative number of borings shall be advanced to define the extent of the impact to soil.
 - (C) Soil samples shall be collected for analysis. Samples shall be collected for laboratory analysis from the water table if non-detect, or from the location of the highest VOC field screening instrument result. If the water table is not encountered and soil contamination above 10 ppm is present, the boring shall be advanced 5 feet beyond the depth of non-detect readings as measured with a VOC field screening instrument.
 - (2) Installation of monitoring wells. If VOC field instrument screening results exceed 10 ppmv in any boring at or above the water table, the PRP shall install monitoring wells sufficient to determine the extent of impacts to groundwater and groundwater flow direction. Groundwater samples shall be collected for appropriate laboratory analysis.
 - (3) Surface water and sediment. Representative samples shall be collected for laboratory analysis to determine whether there are exceedances of environmental media standards in surface water and sediment.

§ 35-406. Additional Site Investigation Work Plan; Approval and Implementation.

- (a) Final determination on additional site investigation work plan. The Secretary shall only approve an additional site investigation work plan if the work plan is designed to adequately characterize the degree and extent of the release and provide information sufficient to evaluate the impact of the release on any sensitive receptor. The Secretary's final decision under this section shall be made in writing.
- (b) Implementation of additional site investigation. Upon approval, a PRP shall implement the approved additional site investigation work plan within 30 days of the date of approval or an alternate timeframe approved by the Secretary. The work plan shall be implemented under the supervision of an environmental professional.

§ 35-407. Additional Site Investigation Report Submission and Review.

- (a) An additional site investigation report shall be submitted within 90 days of receipt of laboratory data or in accordance with an alternate schedule approved by the Secretary. The additional site investigation report shall include the components of a site investigation report, as required by §35-305, and that were approved in the additional site investigation work plan.
- (b) Upon review of the additional site investigation report, the Secretary shall, in writing, notify the PRP that:

- (1) The additional site investigation has adequately defined the scope and extent of contamination and risks to sensitive receptors have been appropriately managed. The site will be closed in accordance with Subchapter 7 .
- (2) The additional site investigation has not adequately defined the scope and extent of contamination and the PRP is required to investigate the site in accordance with Subchapter 3; or
- (3) The additional site investigation report is inadequate and will be returned to the PRP and the environmental professional for revisions.
- (4) The additional site investigation has adequately defined the scope and extent of contamination but risks to sensitive receptors have not been appropriately managed. The PRP be shall develop a corrective action plan in accordance with Subchapter 5.

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SUBCHAPTER 5 CORRECTIVE ACTION

§ 35-501. Exemptions from Corrective Action

Exemptions. The following are exempt from the corrective action requirements of this Subchapter:

- (1) An emergency response performed pursuant to § 35-102(c), provided no corrective action is required after the emergency response is completed;
- (2) A response action to address the release of heating fuels pursuant to Subchapter 4;
- (3) A Resource Conservation and Recovery Act (RCRA) corrective action taken pursuant to 10 V.S.A. § 6606, the Vermont Hazardous Waste Management Regulations, and 40 C.F.R. Part 264 Subpart F;
- (4) Releases remediated under CERCLA; and
- (5) An approved site investigation report which concludes all of the following:
 - (A) that there are no exceedances at drinking water sources, vapor intrusion or other impacts that present a threat to human health;
 - (B) groundwater contamination is confined to the same property where the release occurred;
 - (C) the contamination will not migrate from the property, and concentrations are stable or declining;
 - (D) the hazardous material release has been addressed through a removal of a limited amount of source material,
 - (E) the site investigation demonstrates that there are no direct contact threats; and
 - (F) the Secretary has approved an institutional control plan that meets the requirements of Subchapter 6.

§ 35-502. Objectives of Corrective Action

All corrective actions shall be designed to mitigate the impact of hazardous materials to sensitive receptors to the maximum extent practicable. A corrective action shall accomplish this by implementing the following approaches, in order of priority:

- (1) Treatment of environmental media to the maximum extent practicable, or to levels where the risk may be managed via engineered controls or institutional controls;
- (2) Removal and proper disposal of environmental media impacted by hazardous materials;
- (3) Use of engineered and other controls to contain hazardous materials and to mitigate impacts to environmental media and sensitive receptors; and
- (4) Use of institutional controls to mitigate exposure to sensitive receptors.

§ 35-503. Evaluation of Corrective Action Alternatives

- (a) Evaluation required. At sites that are not exempt in accordance with § 35-501 the PRP shall evaluate corrective action alternatives prior to submitting a corrective action plan to the Secretary.
- (b) Exemption. A PRP may submit a corrective action plan without conducting an evaluation of corrective action alternatives pursuant to this section, provided all the following have been demonstrated to the satisfaction of the Secretary:

- (1) The site investigation report demonstrates that there are no impacts to drinking water sources, vapor intrusion, or other impacts that present a threat to human health;
 - (2) For impacted groundwater, the site investigation report demonstrates that the groundwater contamination is confined to the property where the release occurred on or will recede to the property boundary within five years from the completion of the site investigation;
 - (3) Except when the hazardous material can be addressed through a removal of a limited amount of source material, the site investigation demonstrates that there are no direct contact threats to sensitive receptors; and
 - (4) A corrective action plan will document that the proposed remedy, with respect to the hazardous material in question, has been utilized at other sites and has been demonstrated to be reliable, cost effective, and effective in addressing remediation of the hazardous material.
 - (5) For Development Soil receiving sites, all requirements in §35-512 have been met, and a corrective action plan which addresses potential direct contact with development soils by the public, including capping and land use restrictions, has been approved by the Secretary.
- (c) Identification of corrective action alternatives. The PRP shall identify corrective action alternatives that will eliminate exposure pathways to sensitive receptors. The number and type of alternatives to be considered shall be determined by taking into account the scope, characteristics, and complexity of the problem being addressed. At each site, at least the following alternatives shall be considered:
- (1) An alternative that reduces the toxicity, mobility, or volume of the hazardous materials released to the extent feasible. This alternative shall minimize the need for long term management at the site.
 - (2) An alternative that involves little or no treatment but controls impacts to sensitive receptors through engineered controls, containment, long term monitoring, and institutional controls.
- (d) Evaluation of corrective action alternatives. For each proposed cleanup alternative, the PRP shall evaluate and document the following:
- (1) Compliance with legal requirements. Alternatives shall be evaluated to determine whether the PRP can obtain all federal, state, and local permits for the proposed alternative as well as describe how the alternative will meet those regulatory requirements.
 - (2) Overall protection of human health and the environment. Alternatives shall be assessed to determine whether they can adequately protect human health and the environment, by either eliminating, reducing, or controlling exposures to levels established by the corrective action objectives consistent with § 35-502. Overall protection of sensitive receptors must also assess long-term effectiveness and permanence, short-term effectiveness, and compliance with federal, state, and local laws.
 - (3) Long-term effectiveness and permanence. Alternatives shall be assessed for long-term effectiveness and permanence. Factors that shall be considered include the following:
 - (A) Adequacy and reliability of the proposed alternative such as containment systems and institutional controls that are necessary to manage treatment

- residuals and untreated waste. This factor addresses in particular the uncertainties and risks associated with long term management of the remedy.
- (4) Reducing toxicity, mobility, or volume through treatment. The degree to which alternatives reduce toxicity, mobility, or volume shall be assessed, including how treatment is used to address the principal threats posed by the site. Factors that shall be considered include the following:
 - (A) The treatment or recycling processes the alternatives employ and materials they will treat;
 - (B) The amount of hazardous materials that will be destroyed, treated, or recycled;
 - (C) The degree of expected reduction in toxicity, mobility, or volume of the hazardous materials due to treatment or recycling and the specification of which reduction(s) are occurring;
 - (D) The degree to which rebound of contaminants may occur;
 - (E) The type and quantity of residual contamination that will remain following treatment, considering the toxicity, mobility, propensity to bioaccumulate, and persistence of such hazardous materials and their constituents; and
 - (F) The degree to which treatment reduces the inherent hazards posed by principal threats at the site.
 - (5) Short-term effectiveness. The short-term impacts of alternatives shall be assessed by considering the following:
 - (A) Short-term risks that might be posed to sensitive receptors during implementation of an alternative;
 - (B) Potential impacts to workers during corrective action and the effectiveness and reliability of protective measures; and
 - (C) Potential environmental impacts of the corrective action and the effectiveness and reliability of mitigation measures during implementation.
 - (6) Implementability. The relative degree of difficulty in implementing the alternatives shall be assessed by considering the following:
 - (A) Technical feasibility, including technical difficulties and uncertainty associated with construction and operation of a corrective action, the reliability of the technology, ease of undertaking additional corrective actions, and the ability to monitor the corrective action's effectiveness;
 - (B) Administrative feasibility, including activities needed to coordinate with other offices and agencies and the need to obtain any necessary approvals and permits; and
 - (C) Availability of services and materials, including the adequate off-site treatment, storage capacity, and disposal capacity and services; the availability of necessary equipment and subcontractors, and any necessary additional resources.
 - (7) Cost. The types of costs that shall be assessed include the following:
 - (A) Capital costs;
 - (B) Annual operation and maintenance (O&M) costs; and
 - (C) Net present value of capital and O&M costs.
 - (8) Environmental impact and sustainability. Include a discussion of waste generation and disposal requirements, as well as a discussion of methods to implement best

- management practices to reduce the environmental impact of the proposed remedies in accordance with EPA guidance or ASTM Standard Guide for Greener Cleanups.
- (9) Community acceptance. This assessment includes determining which components of the alternatives interested persons in the community may support, have reservations about, or oppose. The Secretary may require a public comment period and informational meeting on the alternatives or consider community acceptance in the context of public input on the corrective action plan.
- (e) Minimum elements. The PRP shall provide the Secretary with a report that contains the following:
- (1) An executive summary of the corrective action alternatives considered, including a recommended alternative based criteria in subsection (d) of this section.
 - (2) A proposal for any site specific background standards that the PRP proposes to apply to the site in accordance with Appendix B.
 - (3) A proposal for any waiver that the PRP proposes to apply to the site in accordance with Appendix C.
 - (4) A detailed evaluation of the criteria established under subsection (d) of this section for each remedial option selected under subsection (c) of this section.
 - (5) A detailed justification for the selected remedy.

§ 35-504. Secretary Evaluation of Corrective Action Alternatives

- (a) The Secretary shall evaluate each corrective action alternative presented in the evaluation of corrective action alternative report utilizing the criteria of § 35-503(d).
- (b) The Secretary shall provide a written response to the PRP that:
 - (1) Approves the corrective action alternative recommended in the report;
 - (2) Approves an alternate alternative that was considered but not recommended;
 - (3) Requires additional alternative be evaluated; or
 - (4) Requires additional analysis of one of the alternatives reviewed as a part of the report.
 - (5) The report is inadequate and will be returned to the PRP and the environmental professional for revisions.
- (c) The PRP shall, within 30 days of the Secretary's response, provide the Secretary with a response to any comment provided by the Secretary including a revised corrective action alternative or a corrective action plan for the selected alternative.

§ 35-505. Corrective Action Plan

- (a) A corrective action plan shall include the following:
 - (1) Executive summary. An executive summary that includes a description of the contamination, a review of the results of the investigation, remediation and remedial objectives, a summary of the alternatives considered; a description of the chosen corrective action technology, with a statement of site operations and monitoring activities, and an estimate of the duration of the remedial action.
 - (2) Public notice. A list shall be included of the persons who will receive notice under § 35-506(a)(1), including contact names, addresses, e-mail addresses, and phone numbers. A parcel boundary map shall be included showing all such parcels.
 - (3) Performance standards.
 - (A) A discussion of how the corrective action achieves the corrective action objectives identified in § 35-502.

- (B) A list of environmental media standards that apply to the site;
 - (C) A map identifying the compliance points that will be used to monitor compliance with the environmental media standards;
 - (D) A narrative explanation as to why these compliance points were chosen;
 - (E) A narrative explanation as to how any corrective action will ensure that there are no completed pathways that would result in an impact to a sensitive receptor.
 - (F) An estimate of the contaminant mass or volume, expected removal rates, and the estimated duration of the remediation.
 - (G) A list of all local, state, and federal permits required for the project, and the contacts necessary to obtain these permits.
- (4) Remedial construction plan. For any corrective action involving construction of a treatment system, engineered system, including a cap, a containment system, or any other control that requires an engineered design, include:
- (A) Detailed plans and specifications of the corrective action remedial design and related calculations.
 - (B) A Vermont licensed professional engineer's signature of review of the remedial system design.
- (5) Waste management plan.
- (A) A discussion of any waste material that will be generated by the corrective action, including a hazardous waste determination.
 - (B) A plan for managing contaminated soil in accordance with § 35-510, 35-511, or 35-512.
 - (C) Investigation and remediation derived wastes must be managed and disposed as follows:
 - (i) If the waste meets the definition of hazardous waste, the waste shall be managed in accordance with the Vermont Hazardous Waste Management Regulations.
 - (ii) If the waste contains polychlorinated biphenyls (PCBs), it shall be managed in accordance with the Toxic Substance Control Act (TSCA), provided the PCBs are not present at concentrations in excess of 50 parts per million (ppm). The waste also must be managed as a hazardous waste in accordance with the Vermont Hazardous Waste Management Regulations. If PCBs are present at concentrations below 50 ppm, the waste is not a hazardous waste but still may be managed by TSCA.
 - (iii) If the waste does not meet the criteria of subdivisions (i) or (ii) of this subsection, then the waste shall be disposed of:
 - (I) in accordance with the Solid Waste Management Rules, or
 - (II) under a waste management plan approved as a part of the site investigation work plan, provided no investigation and remediation derived waste with a hazardous material above an environmental standard is transported beyond the site.
 - (iv) Petroleum contaminated purge water from groundwater monitoring wells and equipment decontamination water may be returned to the ground within the area of contamination where it was extracted from.

- (v) Non-petroleum, non-hazardous waste contaminated purge water may be returned to the ground within the area of contamination where it was extracted from, if approved by the Secretary.
- (6) Implementation schedule. A corrective action plan shall include an implementation schedule that contains milestones for implementing the corrective action and dates for when those milestones will be reached.
- (7) Corrective action maintenance plan. The corrective action plan shall include a long-term monitoring plan in accordance with § 35-509. The plan shall describe:
 - (A) How any engineered solution will be monitored and maintained to ensure that it continues to operate as designed;
 - (B) How any institutional controls will be monitored and maintained;
 - (C) At the request of the Secretary, a cost estimate for the implementation of the corrective action maintenance plan and a financial responsibility instrument to assure the implementation of the corrective action stewardship plan. Financial assurance under this rule shall be accomplished in the same manner as financial assurance under 40 C.F.R. Part 264 Subpart H;
 - (D) A discussion of the operation and maintenance of any active remedial option after its construction until it attains performance standards established in subsection (a)(3) of this section; and
 - (E) A discussion of how any treatment system will be deconstructed or decommissioned prior to remedial objectives have been met.
- (8) Institutional Control Plan. The corrective action plan shall include an institutional control plan in accordance with § 35-601, unless the corrective action does not leave any residual contamination in place that exceeds any applicable environmental media standards.
- (9) Redevelopment and Reuse Plan. If applicable, the corrective action plan shall include the redevelopment and reuse plan for the property following implementation of the corrective action. Changes or modifications to this plan may require an amendment to the corrective action plan to ensure that sensitive receptors are not adversely impacted.
- (10) Quality Assurance and Quality Control (QA/QC) Plan. The corrective action plan shall contain the following:
 - (A) A list of the Standard Operating Procedures (SOPs) appropriate to the technologies being proposed for the corrective action. The SOP's shall be provided to the Secretary upon request.
 - (B) A Quality assurance/ Quality Control plan. What methods will be employed to ensure the validity and accuracy of the data and technologies implemented.
- (11) Cost Estimate.
 - (A) Applicability. A corrective action plan shall include a cost estimate if State or federal funding will be utilized, if the project is enrolled in the BRELLA program, or if requested by the Secretary,
 - (B) Contents. A cost estimate shall be broken down by task, materials, labor costs, sub-contractor costs, and equipment costs. Estimates for sub-contractors must also be itemized into labor, materials, and equipment costs. Lump-sum estimates will not be accepted. The cost estimate shall contain a separate itemized cost estimate for Corrective Action Plan implementation and system operations and maintenance (O&M).

- (12) An updated set of maps as per § 35-305(b)(12);
- (13) Tabular, time series summaries of contaminant concentrations by medium in accordance with §35-305(b)14).
- (14) Cross-sections of the contaminated zone depicting well or boring depths, soil stratigraphy, recent soil contaminant concentrations, and recent water levels as appropriate to Site-specific conditions.
- (15) A list of all proposed contractors, sub-contractors, including contacts, email addresses, addresses and phone numbers.

§ 35-506. Corrective Action Plan Review; Public Notice; Final Decision

- (a) Complete corrective action plan.
 - (1) Upon a determination by the Secretary that the corrective action plan is complete, a PRP shall provide notice of the corrective action plan to all property owners impacted by the release and to all impacted adjoining property owners, on a form provided by the Secretary.
 - (2) The Secretary will post a copy of the proposed corrective action plan electronically for public comment.
- (b) Review of corrective action. The Secretary shall only approve a corrective action plan upon finding:
 - (1) that the corrective action plan demonstrates that the proposed corrective action meets the criteria of § 35-502 (corrective action objectives), and § 35-505 and the proposed corrective action:
 - (A) ensures that no sensitive receptor will be adversely impacted by the corrective action; or
 - (B) that the corrective action is an interim measure that addresses a portion of the release and that further corrective action is planned to ensure that no sensitive receptor will be adversely impacted.
- (c) Public notice.
 - (1) The Secretary shall electronically provide all interested persons with notice of the draft approval of a corrective action plan.
 - (2) Interested persons shall have 30 days from the date of notice to comment on the draft approved corrective action plan and approval.
 - (3) Any interested person may request a public informational meeting within 14 days of the date of notice. The Secretary shall provide notice to interested persons of a public informational meeting at least 14 days in advance of the meeting.
 - (4) After the close of the comment period, the Secretary shall consider comments prior to issuing a final approval to a corrective action plan. A final approval shall be accompanied by a response to comments made during the comment period.
 - (5) The Secretary shall provide notice to interested persons of the approved corrective action plan.
- (d) The Secretary will approve, in writing, the corrective action plan, if 305-506(a) has been met.
- (e) Corrective action plan. The corrective action plan shall be implemented within 90 days of the approval or in accordance with a schedule approved by the Secretary.
- (f) Amendments to a corrective action plan.
 - (1) Major amendments. All amendments that do not meet the definition of minor amendments to the corrective action plan shall be considered major amendments.

Major amendments shall be noticed in the same manner as required by subsection (b) of this section. Approval must be granted by the Secretary.

- (2) Minor amendments. Minor amendments to a corrective action are amendments that do not change the remedial approach or design in the approved corrective action plan. The PRP shall notify the Secretary and the Secretary shall approve the amendment prior to implementing the minor amendment. Approval must be granted by the Secretary.

§ 35-507. Corrective Action Construction Completion Report

- (a) A corrective action completion report must be submitted within 90 days of completing the construction of any remedy, as applicable, or in accordance with the schedule approved in the corrective action plan.
- (b) A corrective action completion report shall include the following elements when applicable:
- (1) Corrective Action Objectives;
 - (2) Description of work performed;
 - (3) Description of remedial system installed;
 - (4) Certification that the remedial system was installed in accordance with the approved Corrective Action Plan;
 - (5) A description of any field-based amendments to the corrective action and a justification for them.
 - (6) Site plans reflecting post-CAP implementation conditions;
 - (7) Mechanical system layout and list of major components with serial numbers;
 - (8) Piping, control, and instrumentation diagrams along with any modifications to the O&M chapters of the corrective action plan for the installed system;
 - (9) Photo documentation, including:
 - (A) contamination encountered during the corrective action;
 - (B) the installed remedy; and
 - (C) the site before and after implementation of the CAP.
 - (10) Initial remedial system operation data, including:
 - (A) Flow rate;
 - (B) Pressure or vacuum radius of influence;
 - (C) Contaminant removal rates; and
 - (D) Treatment system influent and effluent sample results.
 - (11) Documentation that the Site has been stabilized, physical hazards have been minimized, restored to the restoration plan included in the approved corrective plan;
 - (12) Recovery or injection well boring logs;
 - (13) Copies of all federal, state, and local permits;
 - (14) Waste disposal manifests and bills of lading;
 - (15) Applicable inspection results including building, zoning, plumbing, and electrical, and
 - (16) Recommendations for additional work; and
 - (17) A certification that the activities were performed in accordance with the Corrective Action Plan.

§ 35-508. Review and Final Decision of Corrective Action Construction Completion Report

- (a) The Secretary shall review the corrective action completion report and determine whether the corrective action conforms to the CAP approved by the Secretary.

- (b) If the Secretary concludes that the corrective action undertaken by the PRP fails to implement the approved CAP, the Secretary may require a supplemental corrective action completion report, additional investigation, or additional corrective action at the site.

§ 35-509. Long Term Monitoring

- (a) All sampling points shall be monitored at a frequency defined in the approved CAP. Any adjustment shall be approved by the Secretary in writing.
- (b) The long-term monitoring report, including analytical results, shall be submitted to the Secretary no later than 45 days from the receipt of analytical results from the laboratory or within an alternate schedule approved by the Secretary, except in the following circumstances, in which case the results shall be reported immediately:
 - (1) Drinking water supply laboratory analytical results which report an exceedance of the primary groundwater enforcement standards must be submitted verbally within 24 hours and written analytical results shall be provided to the Secretary within five business days.
 - (2) Indoor air quality laboratory analytical results that report an exceedance of vapor intrusion target indoor air concentrations must be submitted verbally within 24 hours and written analytical results shall be provided to the Secretary within five business days.
- (c) If Site conditions have changed such that the monitoring work plan cannot be carried out as originally approved, then the Secretary shall be notified immediately.
- (d) The Secretary may modify the number of wells sampled or frequency of sampling based on data collected through the site investigation, through long term monitoring, and the Secretary's understanding of site conditions.
- (e) A long-term monitoring report shall include the following:
 - (1) Updated executive summary. Brief summary of findings, conclusions, and recommendations based upon the data collected during the monitoring event.
 - (2) An updated CSM in accordance with § 35-302.
 - (3) Contaminated media characterization in accordance with § 35-305(b)(11).
 - (4) Updated site maps in accordance with § 35-505(b)(12).
 - (5) Documentation of the sample location and method in accordance with the consultant's standard operating procedures (SOP). Justification for deviations from the SOPs shall be described.
 - (6) Any deviations from the approved work plan must be identified and justified.
 - (7) A descriptive analysis of how the data gathered supports the CSM, and whether the corrective action objectives continue to be achieved. The discussion must also establish that the data collected are suitable to determine the risk posed by the hazardous materials, the need for further characterization, and the potential remedial actions. Only data that passes Quality Assurance/Quality Control criteria will be acceptable.
 - (8) All collected data must be organized in narrative, tabular, and graphical form, including maps and cross sections. Graphs of hazardous material concentration versus time; including results from discontinued monitoring locations. All detected hazardous material concentrations shall be reported. Detection limits shall be provided along with analytical results. Detection limits shall be below the environmental media standards. Hazardous materials that are not detected shall be reported as 'ND'.

- (9) NAPL recovery results, when applicable.
- (10) Field screening results from contaminated stockpiled soils in tabular format, with a map showing the locations of the screened samples and the stockpile location in reference to other pertinent physical features including buildings, roadways, and surface water bodies.
- (11) A description of the current condition of the monitoring network, any maintenance activities conducted since the last monitoring event, and any required maintenance that must be completed with a schedule to complete the work.
- (12) Observable changes in Site and neighboring property conditions which may affect Site management. These changes may include change in property use, change in property occupancy, water supply changes, and construction.
- (13) Any observable changes to the property that conflict with any institutional controls developed as part of the response to contamination.
- (14) Documentation of the handling of any investigation and remediation derived waste, which must be dealt with in accordance with § 35-505(a)(5)(c).
- (15) A discussion of the findings of the investigation that substantiate the revised CSM, and, specifically, the risk hazardous materials pose to identified receptors, completed exposure pathways, the identification of data gaps, potentially appropriate corrective actions, proposed monitoring frequency, and need for further investigation, additional corrective action, or Site closure.
- (16) The report shall be signed by an environmental professional and certified in accordance with § 35-104.

§ 35-510. Non-Hazardous Waste Contaminated Soil

- (a) Except as provided in subdivision (c) of this section, off site stockpiling of any contaminated soil is prohibited.
- (b) On-site treatment; non-hazardous waste petroleum contamination in soil – polyencapsulation:
 - (1) Excavated and stockpiled soils must be completely contained or encapsulated within a polyethylene plastic liner, which must be a minimum thickness of 6 mils or another containment method determined by the Secretary to be equally protective.
 - (2) The integrity of the polyethylene liner must be maintained throughout treatment.
 - (3) The soils must remain polyencapsulated on-site until vapor levels are non-detectable (< 1 parts per million by volume (ppmv) headspace) using a field screening instrument, and there is no olfactory or visual evidence of contamination. Aerating the soil pile to accelerate remediation is prohibited.
 - (4) No additional soil may be added to the existing soil stockpile, unless approved by the Secretary.
 - (5) Polyencapsulated soils must be periodically monitored at a frequency defined in an approved corrective action plan to track the rate of biodegradation and to ensure the integrity of the soil pile.
 - (6) The location of the polyencapsulated soil must be in an area where:
 - (A) there are no water supplies within a minimum 300-foot radius. This limit may need to be extended if water supplies are shown to be hydraulically downgradient;
 - (B) There are no sensitive environments including a stream, river, lake, pond, state or federally listed threatened or endangered species or habitat, wetland,

- floodplain, Class I or II groundwater zone, residence, property boundary, or other similar areas, within 100 feet of the treatment location;
- (C) The treatment location is not within zone one or two of a groundwater source protection area;
 - (7) Public access to the location where polyencapsulated soils are stockpiled must be prohibited through posting no trespassing and other means;
 - (8) If the landowner of the property where polyencapsulated soils are stockpiled is different from soil generator, written approval for the soil treatment that also grants access for the Secretary, has been obtained before treatment begins;
 - (9) The location where polyencapsulated soils are stockpiled must be depicted on the site map; and
 - (10) Soil piles must remain polyencapsulated and in good condition. Failure to adequately maintain polyencapsulated soil piles will result in a new release subject to investigation and corrective action.
 - (11) Thin-spreading. The following requirements must be met prior to thin-spreading non-hazardous petroleum contaminated soil stockpiles:
 - (A) Vapor levels are less than 1.0 parts ppmv when measured with a VOC field screening instrument,
 - (B) Soils contain no olfactory or visual evidence of contamination;
 - (C) Confirmatory lab samples as required by the approved corrective action plan.
 - (D) Results of laboratory analysis must be below SSVs;
 - (E) There are no water supplies within a 300 foot radius of the location where soils are thin-spread. This limit may need to be extended if water supplies are shown to be hydraulically downgradient;
 - (F) There are no sensitive environments including a stream, river, lake, pond, state or federally listed threatened or endangered species or habitat, wetland, floodplain, Class I groundwater zone, residence, property boundary, or other similar areas, within 100 feet of the treatment location;
 - (G) The thin-spread location is not within zone one or two of a groundwater source protection area; and
 - (H) Thinspreading has been approved by the Secretary.
- (c) Off-site treatment; non-hazardous waste petroleum contamination in soil. The off-site treatment of soil under this section shall be preapproved by the Secretary prior to the shipment off-site. The local municipality must be notified in writing of the polyencapsulated soil. If applicable, local permits have been obtained. In addition to meeting the requirements of subsection (b) of this section, the PRP shall provide the Secretary with the following:
- (1) The amount of soil that is to be transported to the off-site location;
 - (2) The latitude and longitude of the exact location where the soil was stockpiled;
- (d) On-site soil management. Management of contaminated soil in a previously uncontaminated area is prohibited. Non-hazardous contaminated soil may be managed on the property where the release occurred, provided all the following have been demonstrated:
- (1) The proposed management area meets the siting criteria of subsection (b)(6) of this section;
 - (2) Management will occur above the seasonal high water table;

- (3) An engineered soil cap must be installed following the management to eliminate contact risk. The engineered soil cap must be:
 - (A) If not covered by an impervious surface, a minimum of 18” thick; or
 - (B) If covered by an impervious surface, 6” thick of fill or sub-base material under the impervious surface.
- (4) The engineered soil cap must be clearly marked with a material that distinguishes the divide between the non-hazardous contaminated soils and the clean backfill, both at the top and the bottom of the excavation;
- (5) Soils managed under this subsection must be shown not to be a risk to groundwater, by appropriate sampling method.
- (6) A draft institutional control plan has been included part of the corrective action plan.
- (e) Off-site management. Non-hazardous contaminated soil may be disposed at the following locations:
 - (1) An in-state or out of state solid waste disposal facility; and
 - (2) As provided in § 35-512 for development soils.

§ 35-511. Hazardous Waste Soils

- (a) Hazardous waste soils must be managed in accordance with the Vermont Hazardous Waste Management Rules unless managed in an area of contamination under the approval of the Secretary.
- (b) Contained-in determination. On-site soil that contain listed hazardous waste identified in the Vermont Hazardous Waste Management Regulations must be managed as hazardous waste until the media no longer contains the waste. This may be demonstrated by providing the Secretary with data demonstrating that:
 - (1) The source of the contamination is known and meets the definition of a listed waste;
 - (2) The media of concern does not contain hazardous constituents in concentrations that exceed the characteristic hazardous waste concentrations;
 - (3) The media of concern has been appropriately characterized by representative sampling;
 - (4) Concentrations of contaminants do not present a threat to human health or the environment at final disposition; and
 - (5) Concentrations of the listed waste do not exceed federal land disposal restrictions.
- (c) Prior to managing hazardous wastes under subsection (b) of this section, the Secretary shall determine that the elements of (b)(1) – (5) have been met.

§ 35-512. Development Soils.

- (a) Development Property. A person who applies to manage development soils under this section shall have completed a site investigation pursuant to Subchapter 3 of this rule prior to the excavation of the development soils. In addition to the requirements contained in Subchapter 3, a work plan shall be submitted for approval which includes the following:
 - (1) Soil sample collection methods, which shall consist of one of the following methods:
 - (A) Discrete sampling methodology in a grid pattern. The sampling grid must be appropriately scaled in order to cover the entire proposed area of excavation, and sample points must be collocated in areas of concern; or
 - (B) Application of Incremental Sampling Methodology consistent with the Interstate Technology and Regulatory Council’s (ITRC) Incremental Sampling Methodology (February 2012).

- (2) The number and location of soil samples that will be analyzed using Synthetic Precipitation Leaching Procedure (EPA Method 1312) (SPLP). The number of locations shall be based on the volume of soils planned for management and there shall be minimum one sample for every 200 tons of soil. Samples shall be taken from the soils most likely to leach contaminants and from the most impacted soil locations based on laboratory analysis, field screening, and visual and olfactory evidence; and
- (b) Disposal of Development Soils. Upon a determination by the Secretary, in writing, that the soils proposed for management are development soils, those soils may be disposed at:
 - (1) A categorical solid waste facility that is permitted to receive development soils;
 - (2) A solid waste facility for use as alternate daily cover; or
 - (3) A receiving site that meets the requirements of subsection (c) of this section.
- (c) Receiving site.
 - (1) The receiving site shall meet the siting requirements established in § 35-510(b)(6);
 - (2) A person who wishes to apply to manage development soils under this section shall have completed a site investigation pursuant to Subchapter 3 of this rule prior to the excavation of the development soils. In addition to the requirements contained of Subchapter 3, a work plan shall be submitted for approval which includes the following:
 - (A) Soil sample collection methods which shall consist of one of the following methods:
 - (i) Discrete sampling methodology in a grid pattern. The sampling grid must be appropriately scaled in order to cover the entire area proposed for excavation and sample points must be collocated in areas of concern; or
 - (ii) Application of Incremental Sampling Methodology consistent with ITRC Incremental Sampling Methodology (February, 2012) determination of seasonal groundwater elevations determined through subsurface characterization, including soil borings.
 - (B) The address of the proposed receiving site location and the GIS coordinates of the area where the development soils are proposed to be disposed.
 - (C) If the subsurface characterization determines that groundwater may be impacted, the investigation shall discuss site hydrogeology that includes regional and Site specific hydrogeologic information, horizontal and vertical groundwater flow gradients and direction, and an assessment of the potential for preferential pathways and multiple aquifers. Hydraulic conductivity, transmissivity, and other parameters should also be included, as appropriate
 - (3) The receiving site shall have concentrations of arsenic, lead, and PAH's that are equal to or greater than the concentrations from the Development Property.
 - (4) The receiving site has an approved corrective action plan in accordance with §35-505 that addresses potential direct contact with development soils by the public, including appropriate capping and establishment of land use restrictions.

SUBCHAPTER 6. INSTITUTIONAL CONTROLS

§ 35-601. Institutional Control Plan

- (a) Purpose. The purpose of an institutional control plan is to identify a series of institutional controls to ensure the protection of human health and the environment.
- (b) Acceptable Alternate Institutional Controls. In addition to the institutional controls identified in § 35-602 and § 35-603, the following institutional controls may be acceptable when included as a part of an institutional control plan approved by the Secretary:
 - (1) Zoning Ordinances. Zoning ordinances that place restrictions on uses of an area where the property (e.g. zoning an area commercial or industrial or limits subsurface excavation) is located may be considered as a part of an institutional control plan. Institutional control plans shall address how long term reporting on zoning ordinances will take place to ensure that future modifications to ordinances or bylaws do not allow uses to adversely affect human health or the environment.
 - (2) Water Ordinances. Water ordinances that require all homeowners to be connected to a public community water supply when service is available may be an acceptable institutional control for groundwater use restrictions. Institutional control plans shall address how long-term reporting on water ordinances will take place to ensure that future modifications to ordinances or bylaws do not allow uses to adversely impact human health or the environment.
 - (3) Groundwater reclassification. Groundwater reclassifications may be an acceptable institutional control for groundwater use restrictions.
 - (4) Judicially Approved Controls. Judicial controls may be an acceptable short-term institutional control. The institutional control plan shall identify how the judicially approved controls will allow the control to survive changes property ownership or other transfers of the property.
- (c) Approval of institutional control plan. The Secretary shall approve an institutional control plan providing the following are demonstrated:
 - (1) The PRP has identified all residual contamination that remains in-place on the property;
 - (2) The PRP has identified what restrictions are necessary to ensure that exposure pathways are not created by uses or activities that take place on the property;
 - (3) The PRP has identified a control or controls that address the restrictions identified in subsection (c)(2) of this section; and
 - (4) The PRP has identified a long term monitoring program to ensure that the controls continue to be effective until the contamination no longer poses an unacceptable impact to human health or the environment.

§ 35-602. Notice to the Land Records.

- (a) Purpose. The purpose of a notice to the land record is to inform present and future property owners of the presence of residual subsurface contamination at the property, and applicable land use restrictions.
- (b) Applicability. A Notice to the Land Record is an acceptable institutional control when corrective actions have addressed any exposure pathway to a sensitive receptor but residual contamination above applicable environmental media standards may be present on site.
- (c) Minimum Elements. At a minimum, all notices to the land record shall contain:

- (1) A brief description of the release of hazardous materials;
- (2) A brief description of the corrective action that took place on the site;
- (3) What hazardous materials remain on the site and the location of those hazardous materials.
- (4) A description of the necessary property use restrictions to ensure that no further exposure to hazardous materials takes place.
- (5) The following language must be included:

“If a person fails to follow the use restrictions contained within this notice the person may be liable for further site investigation, remediation, and penalties pursuant to the Vermont Waste Management Act, 10 V.S.A. chapter 159.”

- (d) Filing. A PRP shall file an approved notice to the land record within one week of its approval and shall provide a copy to the Secretary, including the recorder stamp, book, and page number, of the recorded notice to the land record within one week of its recording.

§ 35-603. Deed Restriction/Environmental Easement.

- (a) Purpose. The purpose of a deed restriction is to place legally enforceable land use restrictions on a property to prevent exposure to any hazardous material left on the property and to ensure the protectiveness of any corrective action at the property.
- (b) Applicability. The Secretary may require the use of a deed restriction in the following situations:
 - (1) When long term maintenance or monitoring of the corrective action or property use restrictions are required;
 - (2) When active remedial infrastructure must remain in place in order to prevent contamination from posing a risk to human health or the environment;
 - (3) When a Technical Impracticality (TI) Waiver has been granted by the Secretary in accordance with Appendix E; or
 - (4) When groundwater contamination remains or is projected to remain at the Site above the Vermont Groundwater Enforcement Standards at a compliance point beyond five years
- (c) Minimum Elements:
 - (1) A legal description of the site property;
 - (2) A description of the release, corrective action, and statement of the need for a deed restriction on the property;
 - (3) A grant of access to the Agency of Natural Resources to the property for any reason related to the purpose of the easement, including monitoring of the site, monitoring of the land use controls, planning future corrective action;
 - (4) Restrictions on future uses of the property or portions of the property to prevent receptors from being exposed to any residual contamination that remains on the property and to ensure the effectiveness of any corrective action;
 - (5) A process for enforcing the terms of the easement;
 - (6) A map of where restricted areas are located on the property in recordable form, unless the restrictions apply to the property without restriction.
- (d) Filing. A PRP shall file an approved deed restriction and all exhibits within one week of its approval and shall provide a copy, including the recorder stamp, book, and page number, of the recorded deed restriction within one week of its recording.

SUBCHAPTER 7. SITE CLOSURE

§ 35-701. Site Management Activities Complete

- (a) Effect of site management activity complete designation (SMAC). The SMAC designation means no additional work related to the identified release or releases is required at the time the designation is issued. A SMAC designation shall not release the PRP or parties from any past or future liability associated with the release or releases identified as a part of the response, or from any contamination discovered after the site receives this designation. A SMAC designation does not prevent the Secretary from reassessing the site in light of the reasons stated in subsection (e) of this section, a change in environmental media standards, identification of new or emerging contaminants of concern that require additional responses, new information, or a change in condition that shows sensitive receptors are at risk from the release.
- (b) Request for a SMAC designation. In order to obtain a SMAC designation, the PRP or the Secretary shall submit a request for a SMAC designation that summarizes the site investigation, corrective action undertaken at the Site and documents all the following:
- (1) The source area or areas were removed, remediated, or adequately controlled.
 - (2) Hazardous material data trends collected from site specific environmental media demonstrate that concentrations are stable, falling, or are not detectable.
 - (3) Groundwater enforcement standards as adopted in the Groundwater Protection Rule and Strategy have been met at compliance points established for the site, and groundwater has been reclassified in accordance with the Groundwater Protection Rule and Strategy, if necessary.
 - (4) No hazardous materials associated with the Site are present in drinking water supplies at concentrations in excess of Vermont Primary Groundwater Enforcement Standards.
 - (5) Active remedial activities associated with the Site have been completed.
 - (6) Soil standards have been met at compliance points or, if soil standards have not been met, then a corrective action plan has been implemented with approved engineering and institutional controls to prevent contact to contaminated soils.
 - (7) Vermont water quality standards have been achieved at all surface water compliance point established for the site.
 - (8) Sediment evaluation has been completed and remediation is not required. Migration of hazardous materials from soil to groundwater is not occurring at a concentration which will result in an exceedance of the Vermont Groundwater Enforcement Standards.
 - (9) No completed vapor intrusion pathway exists.
 - (10) The site has been properly closed following the corrective action, including:
 - (A) All groundwater monitoring wells have been properly closed in accordance with Section 12.3.5 in Appendix A of the Vermont Water Supply Rule or an alternate plan has been approved by the Secretary for maintaining the monitoring wells. The Secretary must be notified of the closure of the monitoring wells.
 - (B) Abandoned water supply wells and monitoring wells have been properly closed in accordance with Section 12.3.5 in Appendix A of the Vermont Water Supply Rule.

- (C) All site remedial infrastructure or monitoring points have been closed in a manner to prevent impacts to the environment or human health.
- (D) Contaminated soils have been properly treated or disposed of in accordance with § 35-510, § 35-511, or § 35-512.
- (11) Any outstanding or overdue balances owed to the State (e.g. PCF deductible, Environmental Contingency Fund (ECF) cost recovery, penalties, fines) have been paid to the satisfaction of the Secretary.
- (12) Injection wells have been closed in accordance with 11-907 Well Closure of the Underground Injection Control Rule
- (13) All required institutional controls, engineered controls, and inspection plans are in place and copies have been provided to the Secretary.
- (14) All documentation required by this rule has been submitted to and approved by the Secretary.
- (e) Issuance of SMAC designation. If the Secretary determines that all the requirements of subsection (b) of this section have been met, the Secretary may issue a SMAC designation for the site.
- (d) SMAC as notice to the land records. A copy of the SMAC designation shall be recorded in municipal land records in the municipality where the site is located. The PRP shall within 10 days of recording provide the Secretary a copy of the recorded SMAC letter with the recorder's stamps.
- (e) Reopening of SMAC designation. The Secretary shall return the site to active status on finding any of the following:
 - (1) previous remedial activities that are found to have been inadequate;
 - (2) new information is discovered regarding the time, extent, amount, type, or nature of materials released;
 - (3) new information is discovered regarding the migration of the hazardous materials, health effects of the hazardous materials, or Site conditions;
 - (4) the Secretary identifies errors or omissions in any of the investigation, or corrective action plan, or their associated implementation;
 - (5) a new hazardous material is listed or identified that requires a response by the PRP;
 - (6) additional releases occur;
 - (7) a condition of the SMAC designation was not completed;
 - (8) a requirement of the institutional control plan or necessary reporting was not followed; or
 - (9) any other condition that presents a threat of unreasonable exposure to humans or the environment from a hazardous material that was released from the Site.

§ 35-702. Certificate of Completion

- (a) Eligibility for Certificate of Completion. A PRP shall not obtain a certificate of completion unless all the following have been established:
 - (1) The PRP meets the eligibility requirements identified in 10 V.S.A. § 6645; and has been accepted into the BRELLA program;
 - (2) The Secretary determines that all work required pursuant to 10 V.S.A. Chapter 159, Subchapter 3 has been completed; and
 - (3) The Secretary determines that the requirements of this section have been met.
- (b) Application for certificate of completion. A PRP may request the Secretary issue a certificate of completion by filing an application in the same manner as required by § 35-701(b).

- (c) Review of request for certificate of completion. The Secretary shall review a request for a certificate of completion in the same manner as § 35-701(c).
- (d) Review of request for certificate of completion on substantial completion. A PRP may request that the Secretary issue a certificate of completion based on substantial completion of the corrective action. Issuance of a certificate of completion under this subsection is only eligible for persons who entered the BRELLA program as a prospective purchaser and only the following elements of the corrective action remain uncompleted at the time the application for a certificate of completion is filed with the Secretary:
 - (1) When the Secretary has determined that long term monitoring is a component of the corrective action but the long term monitoring has not been completed; or
 - (2) When the Secretary has required institutional controls but the institutional controls have not yet been recorded at the time of the request.
- (e) Failure to comply with condition subsequent on substantial completion. A certificate of completion issued on substantial completion is contingent upon the PRP completing the conditions subsequent in a timeframe identified by the Secretary. If the PRP fails to do so the certificate of completion shall be void and the PRP shall be required to reapply for a certificate of completion.

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SUBCHAPTER 8. REQUESTS FOR REIMBURSEMENT FOR MUNICIPAL WATER LINE EXTENSIONS FROM THE PETROLEUM CLEANUP OR ENVIRONMENTAL CONTINGENCY FUNDS

§ 35-801. Reimbursement of Municipalities to Provide Alternate Water Supplies

- (a) Applicability. This section shall apply when the following apply:
- (1) there has been a release of a hazardous material;
 - (2) the construction or expansion of or connection to a municipal water line eliminates a sensitive receptor's exposure to a hazardous material; and
 - (3) the work is performed by a municipality and meets the requirements of this section.
- (b) Source of funds. When the release is predominately gasoline, fuel oil, or the release of another petroleum product that would potentially be eligible for reimbursement from the fund established under 10 V.S.A. § 1941 then the reimbursement shall be made from the Petroleum Cleanup Fund; all other reimbursements shall be made from the Contingency Fund established pursuant to 10 V.S.A. § 1283.
- (c) Prohibition on Reimbursement.
- (1) Reimbursements from the Petroleum Cleanup Fund shall be limited to the reimbursement caps established in 10 V.S.A. § 1941(a)(1) and shall only be for uninsured costs.
 - (2) Reimbursements from the Contingency Fund shall be limited to the caps established in 10 V.S.A. § 1283(b) or an amount established by the Secretary taking into consideration the current fund balance and known and estimated future obligations on the fund, whichever is lesser.
 - (3) Where there is a potentially responsible party who has refused to reimburse a municipality for the extension of a municipal water line, the Secretary may condition reimbursement on the successful recovery of funds from that responsible party.
- (d) Requirements for reimbursement.
- (1) The municipality has applied for all necessary permits required for the project, including public drinking water supply permits;
 - (2) Municipality must submit cost estimate for review and approval by the Secretary for all work proposed for reimbursement. If an evaluation of corrective action alternatives, including cost effectiveness compared to water treatment or well replacement, has not been completed prior to the final design of a municipal water line extension, the Secretary may require such an analysis prior to approval of the preliminary approval or prior to the construction of the water line extension.
 - (3) Prior to bidding on a construction project that may encounter contaminated media an environmental professional shall, at a minimum, provide the Secretary with the following:
 - (A) Identify any land uses that may have resulted in the release of hazardous materials on the route of the municipal water line extension. Identification shall be confined to a review of records at the Agency and municipal records.
 - (B) If sampling is necessary, submit a plan to conduct limited sampling to estimate the costs associated with management of contaminated soil and groundwater when installing the municipal water line.

- (C) Soil management plan. This plan shall include work procedures, treatment, and disposal locations for contaminate soil encountered during the construction process. Contaminated soils shall be backfilled during construction unless it is clearly documented that the soils are geotechnically unsuitable or cannot be replaced within the excavation. Contaminated soils to be backfilled, shall be placed at the bottom of the trench with at least 18" of uncontaminated soil used for closing the trench.
- (D) Groundwater management plan. If contaminated groundwater is expected to be encountered, the municipality shall have an environmental professional develop a plan for the treatment of contaminated groundwater. Treatment methods may include re-injection through an infiltration basin, filtration through activated carbon, air stripping, pumping to fractionation tanks, or disposal to a wastewater treatment plant (with appropriate permission from the plant owner and Wastewater Management Division).
- (e) Approval of prebid preliminary investigation. Prior to implementing any work proposed for reimbursement, the Secretary shall approve the prebid preliminary investigation. The Secretary may require additional investigation and work as a part of the approval. The Secretary may disprove any cost associated with a request provided there is a reasonable basis for the disapproval. If an evaluation of corrective action alternatives has not been completed prior to the construction of a municipal water line extension, the Secretary may require such an analysis prior to approval of the prebid preliminary investigation.
- (f) Final reimbursement request. As a part of any request for reimbursement, a municipality shall provide the Secretary, at a minimum, the following information:
 - (1) The results of any investigation, sampling, and field work that took place as a part of the investigation.
 - (2) Receipts for any waste discovered and disposed during the municipal water line extension.
 - (3) Documentation, such as as-builts and certificate of completions, that the constructed municipal water line extension was constructed per the applicable permit requirements
 - (4) The amount requested for reimbursement, including detailed supporting information such as contracts to perform work, detailed invoices from contractors, and other similar information.
 - (5) The Secretary may require additional documentation to support the request for reimbursement.
- (g) Approval of final reimbursement request. Prior to reimbursing a municipality for the extension of a municipal water line the Secretary shall approve the final reimbursement request. The Secretary may require additional documentation to support the request for reimbursement. The Secretary may disprove any cost associated with a request provided there is a reasonable basis for the disapproval.

APPENDIX A. ENVIRONMENTAL MEDIA STANDARDS.

- § 35-APX-A1. Soil Screening Values**
- § 35-APX-A2. Vapor Intrusion Values**
- § 35-APX-A3. Sediment Values**

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APPENDIX B. ESTABLISHMENT OF BACKGROUND CONCENTRATIONS

§ 35-APX-B1. Establishment of Site Specific Background Levels

- (a) Purpose. A PRP may conduct a site-specific background study when there is reason to believe that the contamination present is naturally occurring. An approved site specific background concentration will take the place of an adopted environmental media standard.
- (b) Sampling plan. A sampling and monitoring plan must be prepared by an environmental professional that will produce data representative of the site at and around the area of interest. The plan shall identify, at a minimum, the following:
 - (1) the number of monitoring points that will be sampled to establish a statistically defensible data set that will substantiate the validity of the background concentrations;
 - (2) the location and depth of monitoring points, 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 up- gradient of such activities if possible;
 - (3) the number and frequency of the samples to be taken from the monitoring points and any existing sources of data for the media for which a background standard is proposed, including water for potable water supplies, public water sources, or non-potable wells or springs;
 - (4) the sampling methodology;
 - (5) the contaminants of concern to be analyzed in the samples that are collected;
 - (6) the analytical methods to be used in conducting the sample analysis;
 - (7) 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
 - (8) a quality assurance/quality control plan for sample collection, testing, and analysis.
- (c) Review of sampling plan. The information required by subsection (b) of this section may be included in a site investigation work plan submitted under Subchapter 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 background conditions at and around the area of interest.
- (d) Report on background investigation. Following the Secretary's approval of the sampling and monitoring plan and the completion of sampling, the person seeking to establish a site specific background standard shall report on the following as a part of their site investigation report required by § 35-305:
 - (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 concentration of all substances for which the person seeks to establish background standard 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
- (e) Site specific standard. 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.

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APPENDIX C. SITE MANAGEMENT WAIVERS

§ 35-APX-C1. Technical Impracticality.

- (a) Purpose. A technical impracticality (TI) waiver is a mechanism to manage risks to human health and the environment in situations where there is no readily available technology to complete remediation and achieve compliance with the applicable environmental media standards within a reasonable timeframe. A TI waiver does not waive the requirements to delineate the nature and extent of the release of pollutants, to remediate continuing sources of pollution, or to address potential risks to receptors.
- (b) Applicability. A TI waiver may be considered as a part of § 35-503. TI waivers may be considered for any of the following:
 - (1) The Secretary determines that there are non-aqueous phase liquids that cannot be contained or removed;
 - (2) The Secretary determines that there is only one response action for the activity and it cannot obtain other necessary permits;
 - (3) The Secretary determines that remediation has taken place to reduce in concentration hazardous materials in groundwater and the plume has been controlled to the extent practical based on an evaluation of reliable and innovative technologies;
 - (4) The Secretary determines that achieving compliance with the applicable criteria is technically impracticable as determined using Directive No. 9234.2-25 issued September 1993 by the U.S. Environmental Protection Agency's Office of Solid Waste and Emergency Response
- (c) Prohibition. A TI waiver is prohibited in the following circumstances:
 - (1) situations where the Secretary determines that active remediation is necessary to control the migration of a plume or materially reduce the concentration of a hazardous material; or
 - (2) after approval of a TI waiver there would continue to be unmanaged exposure to human health receptors.
- (d) Technical impracticality waiver documentation. For any PRP proposing a TI waiver, the site investigation report prepared under § 35-305 shall, in addition to all other requirements, contain the following materials:
 - (1) A proposal for the environmental standard or standards that the PRP is seeking a TI waiver for;
 - (2) A proposed TI zone for purposes of implementing the waiver that documents the following:
 - (A) The plume is not increasing in size or concentration in a manner which would alter the risk assumptions associated with the TI waiver request or the extent of the TI Zone;
 - (B) The plume is not increasing at compliance points at the TI Zone boundary.
 - (3) Documentation that all necessary permits have been applied for, made best efforts to obtain, and were denied.
 - (4) Documentation that the site has been adequately characterized including the nature and three-dimensional extent of the contamination;

- (5) Any potential changes in contaminant concentrations will not pose a risk to human health or the environment;
- (6) Documentation that potential exposure pathways threatening human health and the environment from polluted groundwater have been identified and appropriately managed;
- (7) Documentation that all data gaps have been identified and evaluated for significance (a significant data gap would be one that limits the ability to formulate a single scientifically defensible interpretation of environmental conditions or potential risks, or that may affect the choice of remedial approach);
- (8) An evaluation showing the remedial restoration times using active remedial treatments. All assumptions and the degree of uncertainty associated with any model shall be thoroughly discussed;
- (9) An evaluation showing natural attenuation, based on monitoring subsequent to source remediation, has shown that groundwater will not achieve remedial criteria within a reasonable timeframe. All assumptions and the degree of uncertainty associated with any model shall be thoroughly discussed;
- (10) An estimate the cost of remedial alternatives. Cost estimates shall include the present worth of construction, operation, and maintenance costs;
- (11) An evaluation of implementing remediation alternatives for plume containment or for reduction of the concentration of hazardous materials in the plume.

Note: When conducting a TI waiver analysis as a part of an evaluation of cleanup options, the Agency recommends review of the following guidance documents in preparing a request for a TI waiver:

Technical Impracticability: Guidance for Evaluating Technical Impracticability of Groundwater Restoration, September, 1993. USEPA OSWER Directive 9234.2-25

[Technical Impracticability Guidance for Groundwater](#), December, 2013. New Jersey Department of Environmental Protection.

[Draft Guidance for Applying Technical Impracticability of Groundwater](#), February 2014. Connecticut Department of Energy and Environmental Protection.