DRAFT GLOSSARY of TERMS
Bay Harbor CKD Site
Regional Stakeholder Group

CERCLA

Commonly known as "Superfund," Congress passed the Comprehensive Environmental Response, Compensation, and Liability Act in December 1980 to give the President the authority to address abandoned hazardous waste sites in the United States and its territories. CERCLA authority was then delegated from the President to the U.S. EPA. Originally intended to have only a five year life time, CERCLA was reauthorized in 1986 giving the President additional authorities to address hazardous waste sites. Superfund was initially funded through a tax on the production of chemical feed stocks in the U.S. but now is funded through the yearly Congressional budgeting process.

National Oil and Hazardous Substances Contingency Plan

Also know as the National Contingency Plan, or "NCP," for short, the National Oil and Hazardous Substances Contingency Plan is U.S. EPA's promulgated blueprint for implementing the Superfund program. The NCP defines U.S. EPA's Superfund mission and presents the approaches the Agency will take with regard to groundwater cleanup actions, emergency cleanup actions at chemical or oil spills, interacting with state environmental agencies, providing for meaningful community involvement, and finding and dealing with potentially responsible parties (PRPs) at cleanup sites. The NCP also describes the U.S. EPA's approach to site cleanup with respect to its Removal and Remedial programs.

Part 201, Environmental Remediation of the Natural Resources and Environmental Protection Act, 1994 PA 451 as amended (NREPA)

Known as Part 201, Michigan's cleanup law relies on risk based clean up criteria that are linked to residential, commercial and industrial land uses. This risk based system takes into account the use of a property which typically indicates the type of human and environmental exposure that will occur.

Key components of amendments to Part 201 that were passed in 1994 include 1) a causation based liability system for owners and operators, 2) Baseline Environmental Assessment (BEA) provisions to provide liability protection to new property owners and operators, 3) due care provisions to assure contaminated property is used safely, and 4) land use based clean up standards.

National Priorities List (NPL)

CERCLA established a process under which hazardous waste sites are scored based on actual or potential health or environmental threats due to the presence of chemical contaminants. The worst sites are usually placed on the NPL and are then eligible to be addressed using Superfund money. Sites that do not score high enough may be referred to the state environmental agencies or may still be eligible to be addressed by U.S EPA under Superfund using its removal authority.

Removal Program

U.S. EPA addresses both NPL and non-NPL sites under its removal authority. The Removal program undertakes or oversees emergency cleanup actions at chemical spill sites (e.g. train car derailment), oil spills (e.g. pipeline break), non-nuclear industry radioactive contaminant situations (e.g. radium paint sites), or other hazardous situations (e.g. abandoned building containing laboratory chemicals). It also may take action at sites where site cleanup needs are more pressing than should be dealt with under the Remedial Program but yet not so pressing that a health emergency exists. The Bay Harbor site could be thought of as such an example because the CKD leachate presented an immediate safety concern due to the high pH levels measured at the lake shore; however, the associated mercury contamination in the leachate presents a longer term potential threat to human health and the environment.

Removal actions can be taken at NPL sites to stabilize conditions while the remedial program investigates the site. If taken, removal actions generally must be consistent with any future remedial actions taken at a site. U.S. EPA may also compel PRPs to undertake removal actions at sites where such actions are warranted and where PRPs exist.

The on-scene coordinator (OSC) is U.S. EPA's authorized agent to act at a removal site. The NCP presents the OSC's responsibilities and authorities at a removal site.

Remedial Program

U.S. EPA addresses only NPL sites under its remedial authority. As presented in the NCP, the Agency addresses sites that present long term or potential future health risks due to chemical contaminants either by compelling PRPs to undertake site work or conducting the work itself. The process usually begins with a remedial investigation (RI) during which the nature and extent of chemical contamination is mapped out and then actual or potential human health and ecological risks are calculated. Should risks be too high, then a feasibility study (FS) is conducted to evaluate potential cleanup options to address the site risks. Once the FS is complete, U.S. EPA and the state agency propose a cleanup approach and open a minimum 30-day public comment period. Most times a public meeting/hearing is held to present the plan and take comments. After the comment period closes, U.S. EPA evaluates comments received and may revise the proposed cleanup plan in light of them. The Agency then selects a cleanup remedy and issues a Record of Decision (ROD) that details the remedy selection process. The RI/FS and ROD process typically lasts about 2-3 years and can take longer if a site is rather large.

The Remedial Project Manager (RPM) is U.S. EPA's agent to act at an NPL site. The NCP presents the RPM's responsibilities and authorities at an NPL site.

Administrative Order on Consent (AOC)

An AOC is a legally binding and enforceable agreement between U.S. EPA and a PRP or group of PRPs that compels the PRP(s) to undertake certain cleanup work at a site and ensures that the work be performed pursuant to federal law. The work must be performed in accordance with all terms of the agreement and is subject to the oversight and direction by the OSC at a removal site or the RPM at a remedial site.

The AOC in this case is between U.S. EPA and CMS, *et al*., and is the document that governs all current cleanup activity associated with the LTB CKD project. It requires CMS to provide an immediate (cleanup) response to minimize the amount of CKD leachate seeping into the lake, to determine the nature and extent of site contamination, and to evaluate potential cleanup remedies for contaminants found.

Site Characterization

Site characterization describes the activity taken to map out the nature and extent of contamination and to identify potential pathways of concern. At the Bay Harbor site, the work consists of drilling groundwater monitoring wells to provide site-wide geologic and hydrologic information, taking water and soil samples for chemical analysis to determine contaminant levels, and to evaluate actual or potential future site uses by humans and biota. Work also may entail examining old records and aerial photos for evidence of previous site uses or releases.

Contaminants of Concern

Analyses of site water and soil samples may reveal a large number of potential chemical contaminants that could make it unwieldy to document or comprehend the nature and extent of problems at a site. (Not all sites may have this problem.) Not all chemicals reported at a site are contaminants. Thus, once chemical analyses are completed and data are compiled, the Agencies may determine that only a few are present in sufficient quantity and extent to warrant further investigation or attention. The compounds chosen to represent a site's contamination problems are called "chemicals of concern" or "contaminants of concern" or simply "COCs."

For example, at the LTB CKD site, both calcium and mercury were identified in the leachate seeps. However, only one of these compounds may be considered to be a COC because, while both generally are naturally-occurring (not man-made) in the local environment, only one is essential to life and the other is potentially harmful even at very low concentrations.

MDEQ: A chemical or combination of chemicals present in an environmental media (air, soil, groundwater or surface water) at a concentration that may represent a risk to the public health and the environment. In Michigan, the Part 201 generic cleanup criteria are often used to identify contaminants of concern.

Conceptual Site Model (CSM)

A CSM is a graphic depiction of site contaminants in terms of source areas, methods of release from the source areas, and potential exposure pathways leading to significant risk levels. It is a useful tool to help U.S. EPA determine whether or not the RI is complete (Have any exposure or migration pathways been overlooked? Are there any other COCs?) and to also present a succinct snapshot of actual or potential problems at a site to the public.

Baseline Ecological Evaluation

A baseline ecological evaluation is conducted at a site to gather information about potentially sensitive populations in the area and to help determine whether site contaminants pose a concern. Ecologically sensitive populations are identified and then COC levels are compared to levels known to adversely impact those populations. The evaluation also identifies potential exposure pathways for sensitive receptors. Conclusions are reached at the completion of the evaluation that could range from no further study needed to further study is needed to better determine actual or potential risks to sensitive receptors.

At LTB, a baseline evaluation may consist of, but not be limited to, identification of sensitive populations and areas (e.g. fish spawning grounds), whether recorded mercury levels and high pH values tend to cause immediate and/or long term harm to these receptors, and how the receptors may be exposed to mercury in the leachate.

Alternatives Evaluation

An evaluation process that compiles site-specific cleanup alternatives for initial screening using defined criteria. Those alternatives that pass through the initial screening step may be retained for further, in-depth evaluation. An alternatives evaluation for a landfill site, for example, may involve potential cleanup methods that range from on-site incineration to capping. Although costly, incineration may pass through the initial screening step because it is implementable and is a permanent treatment step. On-site incineration of a CKD pile, however, would likely not pass through the initial screening step because cement kiln dust would not be destroyed by incineration and mercury would likely be released to the atmosphere when the CKD is heated to very high temperatures.

CERCLA Evaluation Criteria

A) Removal Program - Three Criteria

Not all removal actions are emergency responses to spills. Non-time critical (NTC) removal actions are cleanup actions that address environmental contaminants under U.S. EPA's Removal program at sites where site cleanup needs are more pressing than should be dealt with under the Remedial Program but yet not so pressing that a health emergency exists. At NTC removals the OSC has time to evaluate a limited number of cleanup alternatives and present a proposed cleanup method to the public for comment. The Removal Program uses three criteria when evaluating potential NTC removal actions – implementability, effectiveness, and cost.

1. Effectiveness. The ability of a cleanup remedy to provide protectiveness and achieve the removal objectives. Protectiveness refers to both the environment and the site cleanup workers. Whether the removal action complies with ARARs (see The Nine Criteria, below) is also considered.

2. Implementability. Evaluates whether goods and services are readily available to put a proposed cleanup action into effect. Also, it evaluates whether it is technically practicable to undertake a proposed cleanup action.

3. Cost. If there are several potential remedies that could meet the above criteria, then the lower cost approach would likely be desirable.

B) Remedial Program – The Nine Criteria

In contrast to a NTC removal action, at an NPL site U.S. EPA's Remedial Program uses The Nine Criteria defined in the NCP to evaluate potential remedial measures in the FS. The remedial alternative that provides for the best overall balance of the criteria is usually selected by U.S. EPA in the ROD.

Selected remedial measures must comply with the first two criteria:

1. Protection of human health and the environment. Supported by results of a site-specific human health risk assessment and an ecological risk assessment. When the selected cleanup is completed, residual health risks will fall within acceptable ranges.
2. Complies with applicable or relevant and appropriate requirements ("ARARs"). Laws enacted specifically to address the situation at a site are applicable; otherwise, laws or regulations may be considered relevant and appropriate. Example: The Safe Drinking Water Act ("SDWA") was enacted to protect consumers of drinking water from a municipal water supply and Maximum Contaminant Levels ("MCLs") in drinking water are promulgated under the act. Groundwater at a cleanup site is not considered to be a municipal water supply, thus, the SDWA is not applicable. However, if the groundwater can or is being used as a source of drinking water, then MCLs may be selected as cleanup levels in the groundwater and the SDWA is considered to be relevant and appropriate.

The following criteria are balancing criteria:

3. Long term Effectiveness and Permanence: The ability of a cleanup remedy to provide protectiveness over time. Example: incineration of organic solvent wastes from a site is a more permanent solution than simply placing the wastes into a landfill.
4. Short term Effectiveness: Evaluation of potential short term risks during the implementation of a cleanup action. Example: hauling a large amount of material from a site to a landfill could present enough of a traffic hazard such that on-site management of material may be desirable.
5. Reduction of toxicity, mobility, or volume of contaminants through treatment. The use of treatment technologies to destroy or isolate wastes is preferable to simply landfilling the wastes.
6. Implementability. Evaluates whether goods and services are readily available to put a proposed cleanup action into effect. Also, it evaluates whether it is technically practicable to undertake a proposed cleanup action.
7. Cost. If there are several potential remedies that could meet the above criteria, then the lower cost approach would likely be desirable.

The last two criteria are modifying criteria:

8. State agency acceptance: Does the state agree with the proposed cleanup approach?
9. Public acceptance: Evaluated during a minimum 30-day comment period.

Technical Impracticability (TI) Demonstration

Under Criteria #6 of the Nine Criteria, above, U.S. EPA evaluates whether it is technically practicable for a remedial alternative to achieve cleanup goals. Typically applied to groundwater cleanup remedies where free-product (solvents) are also present, a TI demonstration may be made to show that, for example, a pump-and-treat remedy could be run "forever" and still not meet the protective cleanup levels selected for COCs in the water because the free-product would continue to contribute more contamination to the groundwater over a long period of time. If determined to be technically impracticable to meet the groundwater cleanup goals using the evaluated alternative, U.S. EPA might not select that alternative as the cleanup remedy and instead chose an alternate method to achieve a protective remedy for the site.

At LTB, mercury levels in site groundwater or leachate can be a problem because the allowable NDPES discharge criterion (see below) is very low in relation to the concentration that water treatment units can reliably achieve. The mercury discharge criterion is 1.3 nanograms/Liter (ng/L) or parts per trillion (ppt); however, current technology can only demonstrate a removal of mercury down to the 10 ppt range for certain flow rates. Thus, it could be construed as being technically impracticable to treat collected water to meet the low discharge concentration. If direct discharge of treated water to the lake was the only cleanup option available, then a TI waiver of the NDPES mercury discharge concentration could be granted as long as other protective measures are taken at the site.

Designation of Inertness

A designation pursuant to Part 115, Solid Waste Management, Rule 299.4118, Petition to Classify Waste, to designate solid waste as an inert material. An inert material defined under Part 115, Section 11504(2), means a substance that will not decompose, dissolve, or in any other way form a contaminated leachate upon contact with water, or other liquids determined by the department as likely to be found at a disposal area, percolating through the substance. A person may petition the director to classify a solid waste as an inert material by demonstrating through the application of standardized laboratory leachate tests that a material does not leachate.

Covenant Not to Sue

Part 201, Environmental Remediation, Section 20133, Redevelopment or Reuse of a Facility, set forth the conditions concerning a Covenant Not to Sue (CNTS). This section states the state may provide a person who proposes to redevelop or reuse a facility, including a vacant manufacturing or abandoned industrial facility, with a CNTS concerning liability. A covenant is a binding agreement or compact to do or keep from doing a specific thing. In this instance a binding agreement to not pursue a person as a liable party.

Groundwater Surface Water Criteria

Use of water quality standards for hazardous substances developed under Part 31, Water Resources Protection that constitutes the generic Groundwater Surface Water Criteria (GSIC) pursuant to Part 201.

Rule 716(17)

Part 201, Environmental Remediation, Rule 716(17) allows a person to appeal to the director for resolution of the GSIC when the GSIC cannot be achieved provided the person has controlled the source of the groundwater contamination and has demonstrated that compliance with a GSI criterion developed under this rule is unachievable.

Mixing Zone Request

A provision pursuant to Part 201, Rule 716, allows a person to request a mixing zone determination as part of a response activity. The development of a mixing zone determination takes into consideration the site specific factors such as the hazardous substances present, their concentration, the rate of discharge to the surface water body, the characteristics of the receiving surface water body and the surface water body use. Using this information the mixing zone determination establishes acceptable concentrations of a hazardous substance to vent or discharge to a particular surface water body at concentrations greater than generic GSIC. Mixing zones are not allowed for bioaccumulative contaminants venting to surface water or hazardous substances that represent an acute hazard.

IRLCS Effectiveness

The extent to which interim response measures (beach collection trenches, targeted leachate extraction, capping, slurry walls, and CKD removal/consolidation) implemented to date have resulted in reduction of elevated pH levels to or below Michigan's water quality standard of 9.0 standard units along the site's 7000 feet of affected shoreline.

This is measured by conducting monthly pH surveys along impacted shore areas

Data Gap (Mercury Flux, Monitoring Well, etc.)

EPA/MDEQ identification of information necessary to complete characterization or understanding of particular components of the remedial investigation. In the case of mercury flux, data gaps are represented as areas along the shore(vertically or horizontally) where mercury concentrations have to be measured in order to allow confidence in understanding how much mercury continues to be released to the lake. To "fill" the data gap, wells must be installed at specific locations and depth to allow these measurements

Cost Optimization Estimate

This is not a standard term. The general concept of cost optimization is sometimes used during discussion of achieving remediation effectiveness and efficiency.

Investigation Completeness

The extent to which removal investigations, and the filling of data gaps identified from initial investigation efforts, are determined sufficient for understanding of the site. Investigations are planned, field work is conducted, results are evaluated, data gaps are identified, and more field work is identified until a convergence on understanding of the site is achieved. This understanding of how contaminants are generated and move and their impacts is necessary to design and implement engineering controls.

NPDES

The National Pollution Discharge Elimination System (NPDES) permit process was initiated by The Federal Water Pollution Control Act amendments of 1972. The purpose of the program is to control the discharge of pollutants into surface waters by imposing effluent limitations to protect the public health and the environment.
The Act also contains four important principles:

1. The discharge of pollutants to navigable waters is not a right.
2. A discharge permit is required to use public resources for waste disposal and limits the amount of pollutants that may be discharged.
3. Wastewater must be treated with the best treatment technology economically achievable - regardless of the condition of the receiving water.

4. Effluent limits must be based on treatment technology performance, but more stringent limits may be imposed if the technology-based limits do not prevent violations of water quality standards in the receiving water.

Groundwater Surface Water Interface (GSI) Requirements

The GSI requirements are embodied in the Part 201 and 31 statutes and the Part 201 Administrative Rules, specifically Rule 716. (See Attachment 1 entitled "Groundwater Surface Water Interface **(**GSI) Statute and Rules" and Attachment 2 entitled "Rule 716")

Attachment 1 - Groundwater Surface Water Interface (GSI) Statute and Rules

324.20120a (15) If a remedial action allows for venting groundwater, the discharge shall comply with requirements of part 31, and the rules promulgated under that part or an alternative method established by rule. If the discharge of venting groundwater is provided for in a remedial action plan that is approved by the department, a permit for the discharge is not required. As used in this subsection, "venting groundwater" means groundwater that is entering a surface water of the state from a facility.

324.3109 Discharge into state waters; prohibitions; violation; penalties; abatement.

Sec. 3109. (1) A person shall not directly or indirectly discharge into the waters of the state a substance that is or may become injurious to any of the following:

(a) To the public health, safety, or welfare.

(b) To domestic, commercial, industrial, agricultural, recreational, or other uses that are being made or may be made of such waters.

(c) To the value or utility of riparian lands.

(d) To livestock, wild animals, birds, fish, aquatic life, or plants or to the growth, propagation, or the growth or propagation thereof be prevented or injuriously affected; or whereby the value of fish and game is or may be destroyed or impaired.

(2) The discharge of any raw sewage of human origin, directly or indirectly, into any of the waters of the state shall be considered prima facie evidence of a violation of this part by the municipality in which the discharge originated unless the discharge is permitted by an order or rule of the department. If the discharge is not the subject of a valid permit issued by the department, a municipality responsible for the discharge may be subject to the remedies provided in section 3115. If the discharge is the subject of a valid permit issued by the department pursuant to section 3112, and is in violation of that permit, a municipality responsible for the discharge is subject to the penalties prescribed in section 3115.

(3) Unless authorized by a permit, order, or rule of the department, the discharge into the waters of this state of any medical waste, as defined in part 138 of the public health code, Act No. 368 of the Public Acts of 1978, being sections 333.13801 to 333.13831 of the Michigan Compiled Laws, is prima facie evidence of a violation of this part and subjects the responsible person to the penalties prescribed in section 3115.

(4) A violation of this section is prima facie evidence of the existence of a public nuisance and in addition to the remedies provided for in this part may be abated according to law in an action brought by the attorney general in a court of competent jurisdiction.

324.3109a Mixing zones for discharges of venting groundwater; conditions not requiring permit; definitions.

Sec. 3109a. (1) Notwithstanding any other provision of this part, or rules promulgated under this part, the department shall allow for a mixing zone for discharges of venting groundwater in the same manner as the department provides for a mixing zone for point source discharges. Mixing zones for discharges of venting groundwater shall not be less protective of public health or the environment than the level of protection provided for mixing zones from point source discharges.

(2) Notwithstanding any other provision of this part, if a discharge of venting groundwater is in compliance with the water quality standards provided for in this part and the rules promulgated under this part, and the

discharge is provided for in a remedial action plan that is approved by the department pursuant to part 201, a permit under this part is not required for that discharge.

(3) As used in this section:
(a) "Mixing zone" means that portion of a water body where a point source discharge or venting groundwater is mixed with receiving water.
(b) "Venting groundwater" means groundwater that is entering a surface water of the state from a facility, as defined in section 20101.

324.3109b Satisfaction of remedial obligations.

Sec. 3109b. Notwithstanding any other provision of this part, remedial actions that satisfy the requirements of part 201 satisfy a person's remedial obligations under this part.

324.3112 Permit to discharge waste into state waters; compliance; condition of validity; modification, suspension, or revocation of permit; reissuance; application for new permit; notice; order; complaint; petition; contested case hearing; rejection of petition.

Sec. 3112. (1) A person shall not discharge any waste or waste effluent into the waters of this state unless the person is in possession of a valid permit from the department. Compliance with the terms of an outstanding order of determination or final order of determination or stipulation with the former water resources commission that is in effect on April 15, 1973, shall be considered to meet the requirements of this section until the department issues its permit. The department shall condition the continued validity of a permit upon the permittee's meeting the effluent requirements that the department considers necessary to prevent unlawful pollution by the dates that the department considers to be reasonable and necessary and to assure compliance with applicable federal law and regulations. If the department finds that the terms of a permit have been, are being, or may be violated, it may modify, suspend, or revoke the permit or grant the permittee a reasonable period of time in which to comply with the permit. The department may reissue a revoked permit upon a showing satisfactory to the department that the permittee has corrected the violation. A person who has had a permit revoked may apply for a new permit.
(2) If the department determines that a person is causing or is about to cause unlawful pollution of the waters of this state, the department may notify the alleged offender of its determination and enter an order requiring the person to abate the pollution or refer the matter to the attorney general for legal action, or both.
(3) A person who is aggrieved by an order of abatement of the department or by the reissuance, modification, suspension, or revocation of an existing permit of the department executed pursuant to this section may file a sworn petition with the commission setting forth the grounds and reasons for the complaint and asking for a contested case hearing on the matter pursuant to the administrative procedures act of 1969, Act No. 306 of the Public Acts of 1969, being sections 24.201 to 24.328 of the Michigan Compiled Laws. A petition filed more than 60 days after action on the order or permit may be rejected by the commission as being untimely.

R 323.2103 (d) "Illicit discharge" means any discharge to, or seepage into, a separate storm sewer that is not composed entirely of storm water or uncontaminated groundwater. Illicit discharges include non-storm water discharges through pipes or other physical connections; dumping of motor vehicle fluids, household hazardous wastes, domestic animal wastes, or litter; collection and intentional dumping of grass clippings or leaf litter; or unauthorized discharges of sewage, industrial waste, restaurant wastes, or any other non-storm water waste directly into a separate storm sewer.

Attachment 2 – MDEQ Rule 716 – GSI Criteria

Rule 716. (1) The pathway addressed by groundwater surface water interface (GSI) criteria shall be considered a relevant pathway when a remedial investigation or application of best professional judgment leads to the conclusion that a hazardous substance in groundwater is reasonably expected to vent to surface water in concentrations that exceed the generic GSI criteria. The factors to be considered in determining whether the pathway is relevant include all of the following:

(a) Whether there is a hydraulic connection between groundwater and the surface water in question.

(b) The proximity of surface water to source areas and areas of the groundwater contaminant plume that currently, or may in the future be expected to, exceed the generic GSI criteria.

(c) Whether the receiving surface water is surface waters of the state as that term is defined in administrative rules under part 31 of the act.

(d) The direction of groundwater movement.

(e) The presence of artificial structures or natural features that would alter hydraulic pathways. This includes, but is not limited to, highly permeable zones, utility corridors, and seawalls.

(f) The mass of hazardous substances present at the facility that may affect groundwater.

(g) Documented facility-specific evidence of natural attenuation, if any.

(2) GSI monitoring wells, as described in subrule (10) of this rule, are not required in order to make a determination under subrule (1) of this rule if other information is sufficient to make a judgment that the pathway is not relevant. Fate and transport modeling may be used, if appropriate, to support a professional judgment under subrule (1) of this rule. Predictions of fate and transport modeling shall be confirmed by field measurements.

(3) The hazardous substances in groundwater and water quality characteristics in surface water for which response activity is required under this rule are all of the following:

(a) Those hazardous substances determined to have been released at the facility.

(b) Any breakdown product of a hazardous substance determined to have been released at the facility.

(c) Any hazardous substance or water quality characteristic that has resulted from a reaction with the hazardous substance released, or that has been adversely affected by a release.

(4) Cleanup criteria for venting groundwater shall be in 1 or more of the following categories:

(a) Generic GSI criteria identified under subrule (6) of this rule, which shall be allowable in the categories provided for in section 20120a(1)(a) to (j) of the act.

(b) Mixing zone-based GSI criteria developed under subrule (8) of this rule, which shall be allowable in the categories provided for in section 20120a(1)(f) to (j) and (2) of the act.

(c) Site-specific criteria developed under section 201201a(2) of the act and subrules (11) and (12) of this rule. Mixing zones may be applied to site-specific criteria.

(5) R 299.5526(9) and subrules (6) to (13) and (15) of this rule specify procedures for demonstrating compliance with part 31 of the act through modifications of the part 31 rules that accommodate the differences between venting groundwater and a permitted discharge to surface water under part 31. As such, the subrules include alternative methods, as allowed for under section 20120a(15) of the act, to the procedures set forth in the rules promulgated under part 31.

(6) The department shall identify water quality standards for hazardous substances developed under part 31 of the act that constitute generic GSI criteria. Compliance with section 20120a(15) of the act and this rule is demonstrated if generic GSI criteria are not exceeded in the groundwater in the GSI monitoring wells required by subrule (10) of this rule and no water quality characteristics as described in subrule (3) of this rule exist that require response activity. If compliance cannot be achieved under subrule (6) of this rule, then a person may proceed under subrule (7) of this rule.

(7) A person may request, as provided in R 299.5526(9) and R 299.5532(11)(d), that the department authorize a response activity that includes a mixing zone. The mixing zone determination request shall provide the information required by the department to process the request, including all of the following:

(a) The name of the receiving surface water and the location where groundwater is venting.

(b) The location, nature, and chemical characteristics of past and current sources of groundwater contamination.

(c) The name, chemical abstract service number, and concentration in the groundwater at the GSI and upgradient of the interface to the source area of hazardous substances and water quality characteristics described in subrule (3) of this rule.

(d) The discharge rate, in cubic feet per second, of that portion of the venting groundwater plume that exceeds, or is likely in the future to exceed, a generic GSI criterion.

(e) The location of other venting groundwater plumes in the vicinity of the facility in question, together with information about the names and concentrations of hazardous substances in those plumes, if available.

(f) If the venting groundwater is a new or increased discharge to the surface waters of the state, then information to support an antidegradation demonstration or exemption, if one is required or allowed under R 323.1098.

(8) In response to a request under subrule (7) of this rule, the department shall calculate mixing zone based GSI criteria according to section 3109a of the act and the related rules promulgated under part 31.

(9) Compliance with mixing zone-based GSI criteria shall be assessed according to the following procedures:

(a) Compliance with section 20120a(15) of the act and this rule is demonstrated if the mixing zone based GSI criteria are not exceeded at the GSI monitoring wells required by subrule (10) of this rule and no water quality characteristics as described in subrule (3) of this rule exist that require response activity.

(b) Compliance with mixing zone-based GSI criteria that are based on chronic toxicity endpoints may be established by a statistical evaluation of the data, if that evaluation is part of a department-approved monitoring plan. The statistical evaluation may be based, if sufficient data are available, on a properly calculated and documented 95% upper confidence limit on the mean, or other statistical technique approved by the department. Compliance with mixing zone-based GSI criteria that are based on acute toxicity shall be demonstrated on a point-by-point basis.

(c) A contingency plan may be required by the department in conjunction with an authorization to rely on mixing zone-based GSI criteria if it is necessary to identify additional response activity that may be required in response to a future exceedance of the mixing zone-based GSI criteria and to assure protection of the public health, safety, and welfare, and the environment. The contingency plan shall allow for evaluation of the significance of any exceedance before implementation of additional response activity to control a future discharge that exceeds the mixing zone-based GSI criteria. Such evaluations shall consider, at a minimum, the magnitude and expected duration of the exceedance and the feasibility of implementing additional response activity during the anticipated duration of the exceedance.

(10) For groundwater venting to surface water, that does not vent indirectly through a storm sewer, GSI monitoring points shall be established by installing vertical wells at locations in the saturated zone that are representative of groundwater entering surface water. The vertical wells shall be installed as close as is practical to the surface water, where it can be demonstrated that the groundwater flow direction is toward the surface water in question. GSI monitoring activities shall also satisfy all of the following requirements:

(a) Concentrations in samples from GSI monitoring points shall be compared to generic GSI criteria, site-specific GSI criteria developed under section 20120a(2) of the act, or mixing zone-based GSI criteria, and applicable water quality standards to determine compliance with part 31 of the act and this rule.

(b) GSI monitoring points shall include the interval or intervals within each well or well cluster that shows the highest concentration of each hazardous substance present in that well or well cluster, in light of the physical properties of the hazardous substance and the characteristics of the saturated zone.

(c) Samples from GSI monitoring points shall be representative of groundwater, not surface water, and account for seasonal or periodic shifts in groundwater flow direction, or other natural or human-made features that affect groundwater flow.

(d) The location of a GSI monitoring point shall be selected after taking into consideration changes in groundwater flow direction, so that samples from the well are representative of groundwater flowing to surface water. This requirement does not preclude location of monitoring points in a floodplain.

(e) If a portion of the saturated zone does not vent to the surface water in question, then that portion of the groundwater is not required to be monitored as a GSI monitoring location for that surface water.

(11) A person may request that the department approve a site-specific GSI criterion or site-specific mixing zone under section 20120a(2) of the act only if all of the following conditions are satisfied:

(a) A site-specific criterion shall comply with part 31 of the act and the rules promulgated under part 31, as modified by this rule to apply to venting groundwater.

(b) Only numerical criteria, expressed as hazardous substance concentrations in water or as limits for water quality characteristics for which response activity is required by subrule (3) of this rule, are acceptable as site-specific criteria under 201201a(2) of the act.

(c) A site-specific criterion may be proposed for approval by the department under the rules promulgated pursuant to part 31 of the act that allow for water quality standards based on site-specific modifications, mixing zone demonstrations, or conditions resulting from discharge into the same body of water, as that term is defined in those rules.

(12) Compliance with a site-specific criterion or mixing zone approved under subrule (11) of this rule shall be based on a site-specific monitoring plan that takes into account the basis for the site-specific criterion or mixing zone.

(13) A person may propose to rely on monitoring points other than GSI monitoring wells required by subrule (10) of this rule. Alternative monitoring points are acceptable only if approved by the department in accordance with the requirements and procedures set forth in this rule. A proposal for alternative monitoring points shall be submitted to the department for approval and shall include all of the following:

(a) A demonstration that the proposed monitoring points are more representative of venting groundwater and allow a more accurate calculation of the discharge rate described in subrule (7)(d) of this rule than the monitoring wells required by subrule (10) of this rule.

(b) A demonstration that the locations where venting groundwater enters surface water have been comprehensively identified. That demonstration shall include all of the following:

(i) Identification of the location of proposed monitoring points within areas of venting groundwater, including, if relevant, monitoring of water from pore spaces in lake or stream sediment, and the rationale for those locations.

(ii) Documentation of the boundaries of the areas where the groundwater plume vents to surface water, including the size, shape, location, and manner in which dispersion and diffusion would occur. This documentation shall include information about the substrate character and geology in the areas where groundwater vents to surface water.

(iii) Documentation that the venting area identified and proposed monitoring points include points that are representative of the highest concentrations of hazardous substances present in the groundwater at the GSI, considering spatial and temporal variability.

(iv) If compliance with a mixing zone based GSI criterion is to be determined with data from the alternative monitoring points, documentation that it is possible to accurately calculate the volume of venting groundwater.

(c) A demonstration that the alternative GSI monitoring points will allow for venting groundwater to be sampled before mixing with surface water.

(d) A demonstration that the proposed alternative GSI monitoring points allow for reliable, representative monitoring of groundwater quality. This demonstration shall take into account all of the following:

(i) Temporal and spatial variability of hazardous substance concentrations in groundwater throughout the plume from the source or sources to the points of venting to surface water.

(i) Seasonal or periodic changes in groundwater flow.

(ii) Other natural or human-made features that affect groundwater flow.

(e) Identification and documentation of the chemical, physical, or biological processes that result in the reduction of hazardous substance concentrations between the monitoring wells required by subrule (10) of this rule and the proposed alternative monitoring points.

(f) The location of an alternative GSI monitoring point shall be selected after taking into consideration changes in groundwater flow conditions, so that samples from the monitoring point are representative of groundwater flowing to surface water. This requirement does not preclude location of monitoring points in a floodplain.

(g) Identification of sentinel monitoring points that will be used in conjunction with the alternative GSI monitoring points to assure that any potential exceedance of an applicable water quality standard can be identified with sufficient notice to allow additional response activity to be implemented that will prevent the exceedance. Sentinel monitoring points shall include, at a minimum, the monitoring points required by subrule (10) of this rule.

(14) If there is an exceedance of a GSI criterion based on acute toxicity at a monitoring well required by subrule (10) of this rule or an alternative monitoring point approved under subrule (13) of this rule then immediate action shall be taken as described in this rule:

(a) A person who is implementing response activity who determines that there is an exceedance of a GSI criterion based on acute toxicity at a monitoring well required by subrule (10) of this rule or an alternative monitoring point approved under subrule (13) of this rule shall notify the department of that

condition within 7 days of obtaining knowledge that the exceedance is occurring, or within 30 days of the effective date of this rule, whichever is later, if that person is liable under section 20126 of the act, or if the person intends to seek approval of an alternative monitoring point under subrule (13) of this rule when one is not already approved.

(b) The person implementing response activity shall, within 60 days of the date on which notice is required under subdivision (a) of this subrule, do one or more of the following:

(i) Implement response activity to prevent the exceedance of a GSI criterion based on acute toxicity at the monitoring wells required by subrule (10) of this rule or an alternative monitoring point approved under subrule (13) of this rule, if applicable, and submit a schedule to the department for completion of response activity to prevent a discharge that exceeds a GSI criterion based on acute toxicity.

(ii) Submit notice of intent to propose an alternative monitoring point that complies with subrule (13) of this rule, if one has not already been approved. The notice shall include a schedule for submission of the proposal.

(iii) Submit notice of intent to propose a site-specific criterion under section 20120a(2) of the act. The notice shall include a schedule for submission of the proposal.

The department may approve a schedule as submitted under this subdivision or direct reasonable modifications in the schedule. The department may grant extensions of time for actions required under subdivision (b) of this subrule and for activities in an approved or department-modified schedule if the person is acting in good faith and site conditions inhibit progress or completion of such activity or if there is no adverse impact on surface water resources as a result of the discharge. The department's decision to grant an extension or impose a schedule modification shall consider the practical problems associated with carrying out the required response activity and the nature and extent of the exceedances of GSI criteria.

(c) If the person does not implement effective response activity or submit a notice as required by subdivision (b) of this subrule, or does not comply with the schedule in his or her notice, including modifications made by the department, if any, and no schedule extension was approved by the department, the person shall perform interim response activity sufficient to prevent the exceedance of any GSI criterion based on acute toxicity at the monitoring wells required by subrule (10) of this rule or an alternative monitoring point approved under subrule (13) of this rule, if applicable. He or she shall continue such activity until agreement on an alternative monitoring point or site-specific criterion is reached, if applicable, or, if the proposal is rejected by the department, until a different response activity is implemented to protect the surface water. If an alternative monitoring point was approved by the department prior to detection of the exceedance of a GSI criterion based on acute toxicity in that alternative monitoring point, action to prevent that exceedance shall continue as long as there is a reasonable potential for an exceedance to occur or until a different response activity is implemented to protect the surface water. Interim response activity undertaken to prevent the exceedance during the time needed for review by the department of the proposal shall be documented. An alternative monitoring point proposal that does not adequately document interim response activity required to satisfy this rule, if applicable, shall be considered lacking information necessary or required for the department to make its decision.

(15) If a person proposes a site-specific GSI criterion or alternative GSI monitoring point and the department does not approve the proposal, then the department shall indicate, in writing, the rationale for its disapproval, citing the scientific, mathematical, or legal basis for its disapproval. This written communication shall also indicate whether the department will entertain further proposals to address the issue.

(16) When groundwater is venting indirectly to surface waters of the state, that groundwater shall be addressed in one of the following ways, as applicable to the situation:

(a) If venting groundwater enters a storm drainage system owned by an entity that is subject to storm water regulation under the federal water pollution control act, 33 U.S.C. §§ 1251-1387, then the person who is conducting response activity to address that venting groundwater shall comply with applicable storm water program requirements regarding elimination of illicit discharges in the storm drainage system owner's discharge permit or with local ordinances regarding illicit discharges, if such ordinances apply.

(b) In all other cases, when groundwater is venting indirectly to surface waters of the state through storm sewers, monitoring points shall be established in locations that are as close as practical to the storm sewer or shall be at alternative monitoring locations approved by the department to allow representative monitoring before the groundwater mixes with any flow in the sewer. The GSI criteria applicable at the monitoring point required by this subdivision may be mixing zone based criteria that are based on the

characteristics of the receiving water to which the sewer discharges, if a proposal for mixing zone based criteria is approved by the department under this rule.

(17) If a person has controlled the source of groundwater contamination and has demonstrated that compliance with a GSI criterion developed under this rule is unachievable, then that person may appeal to the director for resolution of the matter. An appeal to the director under this rule shall be made in writing and include documentation of the reasons why compliance is unachievable. If a decision on the appeal is not rendered with 60 days after the director receives the appeal, the director shall provide a preliminary response within that time period. The director's preliminary response shall indicate the additional information, if any, required to make a determination and specify the anticipated time required to render a final decision. Decisions by the director under this subrule shall consider the public interest and the need to protect the public health, safety, and welfare, and the environment.