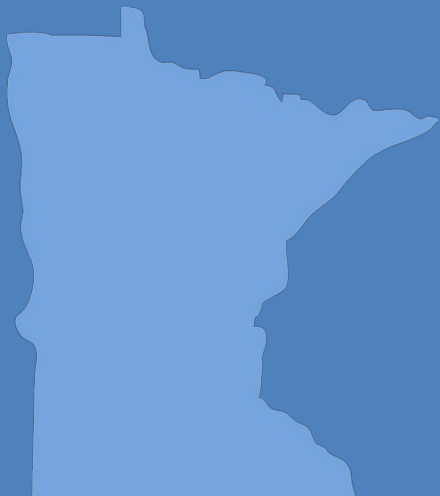


Property Use Guidance



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Acronyms

BTV	Background thresholds values
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
HRL	Health risk level
MCL	Maximum contaminant level
MERLA	Minnesota Environmental Response and Liability Act
MnDOT	Minnesota Department of Transportation
MPCA	Minnesota Pollution Control Agency
RCRA	Resource Conservation and Recovery Act
R/R	Residential/Recreational Land Use
SRV	Soil Reference Values
VIC	Voluntary Investigation and Cleanup

1.0 Introduction

This document provides guidance on incorporating current, planned and future land use into decisions for projects conducted under the Minnesota Environmental Response and Liability Act (MERLA) in the Minnesota Pollution Control Agency (MPCA) Superfund Program, Voluntary Investigation and Cleanup (VIC) Program, and under the Resource Conservation and Recovery Act (RCRA) Corrective Action Program. The environmental releases covered by this guidance include hazardous substances, pollutants and contaminants as defined in MERLA for the protection of human health, welfare, and the environment.

This document is not a final agency action and does not create any rights, duties, obligations, or defenses, implied or otherwise, in any third parties. The recommendations contained in this document should not be construed as a requirement of rule or statute, although some terms clarify existing rule or statute. The MPCA anticipates revising this document from time to time as conditions warrant.

The policies and approach outlined in this document are generally consistent with the federal National Oil and Hazardous Substances Pollution Contingency Plan (National Contingency Plan); however, federal requirements need to be consulted if compliance with the federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) requirements is necessary for federal oversight or cost recovery under CERCLA. Local requirements also play an important role in land use and environmental decisions. Current and planned land use routinely play a large part in planning and conducting environmental investigations and response actions, and often in future environmental monitoring and maintenance.

A complete cleanup of all releases at a property, also known as a permanent cleanup, is the ideal response action goal. No land use restrictions, ongoing risk management, or ongoing MPCA monitoring and oversight of the property is necessary with a permanent cleanup. Commonly a permanent cleanup is not feasible or reasonable. The National Contingency Plan specifies nine criteria for federal oversight projects and Minnesota has five criteria for state-oversight projects that are used to determine what constitute a feasible and reasonable cleanup with ongoing risk management and are described in the MPCA Remedy Selection Guidance www.pca.state.mn.us/waste/risk-based-site-evaluation-guidance. Risk-based values and site-specific values, and standards and criteria are used to determine whether response actions are necessary and are used to set cleanup goals. This document describes how risk-based values and site-specific values, standards and criteria are used in property and release investigations and response actions in conjunction with current, planned and future land use.

2.0 Identifying land use

Primarily, land use is determined by the property owner, operators of facilities at the property, and local agencies and organizations with authority to influence or place restrictions on land use through zoning, master development plans, watershed plans, building permits, and other local requirements. State and federal agencies may also have authority to influence or place restrictions on land use, such as surface water impairment waters.

Three types of land use, based on known and likely use of the property, are:

- **Current land use** – existing use of the land, buildings, structures, paved areas, landscaping, green-space, and other features of a property
- **Planned land use** – existing redevelopment or renovation plans which require changes to the property, changes in land use, or both
- **Future land use** – potential future use of the property beyond the planned land use and any potential future redevelopment activities to prepare the property for the future land use

Current, planned, and future land use should be considered when determining appropriate response actions. Combinations of the types of land use are often utilized at a single property over a period of time. One example is when one portion of a property will remain under the existing land use for a number of years (current land use) before it is redeveloped (future land use), and another part of the property is redeveloped right away (planned land use). Future land use is commonly determined using property owner informal plans, local development and public works plans, and zoning information.

3.0 Conducting investigations

VIC, Superfund, and RCRA Corrective Action program site investigations require:

- Phase I Investigation or Preliminary Investigation literature search and analysis of available property and environmental records
- Phase II Investigation or Remedial Investigation (field investigation) that consists of environmental observations and sampling, and chemical analysis of soil, soil vapor, groundwater, and/or surface water
- Hazardous Substances Survey for existing buildings

Generally, the current land use is not interrupted by the investigation process, unless an emergency health or environmental risk situation is identified or current practices are causing an increase in the magnitude or extent of the release.

Requirements for defining a release, and investigation approaches and procedures are available in the MPCA Risk-Based Site Evaluation Guidance documents for soil, groundwater, surface water and soil vapor (www.pca.state.mn.us/waste/risk-based-site-evaluation-guidance). Investigation requirements for non-responsible parties are often more limited than for responsible parties.

3.1 Investigations by responsible parties

Responsible parties in the Superfund and RCRA programs, including voluntary responsible parties, are required to fully characterize all encountered environmental releases for which they are responsible. They are required to determine the magnitude and extent of these releases, including any portions of the releases that have migrated off their property. **For a responsible party, the investigation extent is based on the release extent, not property boundaries.** Therefore, investigations by responsible parties must include evaluations of current and planned land uses for all properties impacted by the releases for which they are responsible.

3.2 Investigations by non-responsible parties

Non-responsible Voluntary Parties have entered the VIC Program for a specific investigation property, typically a Brownfield Redevelopment site, and conduct enough field investigation on the investigation property to demonstrate all of the following:

- Any existing releases will not cause excessive risk to human health or welfare, or the environment, based on the current and planned land use and the magnitude and extent of any releases
- The planned land use will not unreasonably inhibit further investigation and response actions conducted by responsible parties or the state
- The ongoing current or planned land use will not increase the magnitude or extent of existing releases
- Data needs to be submitted to support a Record of Decision and/or Response Action Plan, if required, and any engineered and/or institutional controls

The type of liability assurances requested by a non-responsible party and the nature of the current and/or planned land use will determine the investigation requirements. **For a non-responsible party, the field investigation extent is based on the investigation property boundary, not the extent of releases migrating off the investigation property.** Although the current and planned land use that

applies for a non-responsible voluntary party is only for the investigation property, the type and magnitude of releases that reach the property boundaries are expected to be characterized. This characterization includes completing the investigation of each release to the property boundaries as appropriate, and conducting a limited potential receptor survey if the release appears to be migrating off the property. The limited potential receptor survey should be sent to the MPCA Site Assessment Program with the environmental reports documenting the releases to determine whether follow-up will be necessary by the state and/or responsible parties. A limited potential receptor survey should use a ½ mile radius from the property boundaries and include:

- A list of surface water bodies
- A list of sensitive populations, such as long-term care facilities, schools, day care facilities, and fauna and flora on the Department of Natural Resources' Minnesota Biological Survey maps (www.dnr.state.mn.us/eco/mcbs/maps.html)
- A list and map of wells, available in the Minnesota Department of Health's Minnesota Well Index (www.health.state.mn.us/divs/eh/cwi/)

4.0 Determining response actions and future risk management

Once the releases have been characterized by an investigation and the current, planned, and future land use have been identified, the information is used to:

- Decide whether response actions are necessary
- Identify appropriate cleanup goals
- Determine what response action options are appropriate
- Determine if institutional controls are needed for the property

Typically, the need for response actions and response action options are discussed throughout the investigation and often the investigation is designed to provide the information needed to determine whether specific response actions are feasible. The response action options evaluated include:

- No response actions
- Response actions resulting in a permanent cleanup
- Response actions leading to risk management of the remaining releases which may or may not include institutional controls and/or long term monitoring
- Response actions that provide alternate drinking water sources or vapor mitigation systems

At this point, it is important for both responsible parties and non-responsible parties to recognize what their ongoing responsibilities would be for risk management options. Often there are multiple response action options acceptable to the MPCA, so the choice between the acceptable options is made by the responsible party or non-responsible party.

A common risk management option includes leaving non-leaching contaminated soil at depth with a clean soil cover, which the property owner agrees will not be disturbed without the property owner obtaining the consent of the MPCA in writing, usually after submitting an excavation work plan. Other options require a property owner to take a more active role, such as long-term maintenance or monitoring with annual reporting to the MPCA. Land use restrictions and actions required of the property owner typically increase with increased reliance on risk management rather than contaminant treatment or removal.

The MPCA may require response actions by a responsible party to include contaminant source treatment and/or removal if the contamination is migrating off-site and impacting properties not owned by the responsible party. Responsible parties may need to negotiate agreements with off-site landowners to determine land use restrictions if a release is migrating off-site and the response actions do not include a rapid cleanup of the release source. The agreements need to cover current, planned and future land use. The approval of local government units may be necessary, especially planning, zoning and public works departments. In some areas of widespread contamination, the MPCA may request that the Minnesota Department of Health or local units of government designate areas of restricted resource use, such as well advisories, special well construction areas, and land use ordinances.

On redevelopment or renovation projects, response actions are typically carried out concurrently with the redevelopment and renovation work to minimize interference with demolition and construction schedules and to take advantage of cost savings such as excavation work necessary for both remediation and demolition or construction. Redevelopment plans are often designed to remove contamination or limit exposure. Often, a contaminant release and risks are controlled and mitigated by site redevelopment.

Risk-management response actions will not be considered completed until the following are concluded:

- Completion of a risk management plan for the release
- Recording of any required institutional controls against the property deeds for all properties with land use restrictions due to the release
- The responsible party or property owner has continuing obligations to follow through on the requirements of the risk management plan and requirements listed in the institutional controls, including but not limited to any required reporting to the MPCA

5.0 Assessment of contaminant accessibility

Accessibility of contamination to humans and ecological receptors and migration of contaminants are considered when assessing risk management options and determining response action goals.

Accessibility is directly related to resource use as well as the type of dermal, inhalation, and ingestion exposure. Guidance on soil, groundwater, soil vapor, and surface water risk evaluation, investigation, remediation, risk-based values, standards and criteria are available on the MPCA website www.pca.state.mn.us/waste/risk-based-site-evaluation-guidance.

5.1 Soil accessibility

Soil accessibility categories, based on the prevalence of soil disturbance activities, are used with other factors to set soil cleanup and risk-management goals. These categories are used as general guides and soil accessibility needs to be modified on a site-specific basis for reasons such as shallow groundwater, contaminant, and soil type characteristics, characteristics of ecological receptors, existing buildings and structures, utility lines, railroad lines, and tunnels.

Accessible contamination applies to soil located less than 4 feet below the ground surface; this depth is based on the typical frequency of disturbance of soil for common activities such as planting trees and other vegetation; fence, landscaping, and rain garden installation and maintenance; gardening; and shallow utility maintenance.

Potentially accessible contamination applies to soil located 4 to 12 feet below ground surface. This depth interval is based on activities such as deep utility installation and maintenance, basement and foundation repairs, drain tile and swimming pool installation and maintenance, and single family home construction activities.

Remotely accessible contamination applies to soil at depths greater than 12 feet below ground surface that is not likely to be disturbed, except by excavation professionals.

5.2 Special waste accessibility

Special wastes encountered in soil require more vigilant management and disposal than typical solid wastes and need to be considered when assessing contaminant accessibility and potential for migration. These wastes can include relatively immobile contaminants such as buried asbestos containing waste materials, or potentially very mobile wastes such as buried containers of liquid chemical wastes. Other special wastes include RCRA listed and characteristic hazardous wastes, principle threat wastes, soil contaminated with polychlorinated biphenyls, and potentially explosive compounds.

5.3 Groundwater accessibility

Groundwater accessibility is generally through water contact from wells or springs. Water uses such as municipal and private well drinking water, domestic use water, landscape watering, commercial cleaning water, and industrial production and processing water are considered when assessing groundwater accessibility. Assessment of contaminant migration to groundwater includes infiltration from surface water, infiltration from buried stormwater treatment structures, and leaching from contaminated soil.

5.4 Soil vapor accessibility

Vapor exposure health risks are associated with intrusion into occupied buildings and structures such as basements, tunnels, and underground utility maintenance rooms. The condition of structures should be noted when evaluating potential risk. In addition to toxic chemicals, explosive compounds such as methane and hydrogen sulfide are assessed.

5.5 Surface water and sediment accessibility

Surface water and sediment accessibility mainly depends on the setting, type and size of the water body. Human accessibility is based on types of water use for the specific water body and ecological use. Sensitive, threatened and endangered species are considered. Parcel redevelopment projects most often involve small stormwater ponds, ditches and wetlands. Major facility releases may contaminate major lakes and rivers, impacting regional areas, mixed land uses, and recreational and ecological areas. Migration of contaminated groundwater and leaching from contaminated soil and sediment to surface water are studied in investigations.

6.0 Notifications, Institutional Controls and Access

Properties with remaining contamination, long-term monitoring, and/or ongoing response actions with maintenance requirements will need documentation and notification to current and future property owners. Several methods are used to provide notice of remaining contamination, restrict use, and require ongoing responsibilities for operation, maintenance, and monitoring of risk management requirements. Notifications are brief notices in an assurance letter to land owners that remaining contamination may affect the future use of the property. Institutional controls are legally enforceable restrictions, conditions, or controls on the use of property, and are used to assure that response actions are protective of public health or welfare or the environment. Institutional controls are often documents recorded against real property describing remaining contamination, restrictions on the use of real property, and required maintenance and monitoring of risk management response actions. Local requirements and land use planning tools such as zoning may also limit the use of properties with remaining contamination. Access agreements or easements are used to allow the state and state contractors to access property owned by private parties or local units of government.

Notifications, Institutional Controls, Access Agreements and Easements may cover an entire property or be limited to a specific area, release or environmental media at a property.

Decisions on whether to use a notification, institutional control, access agreement and easement are typically made at the time the Response Action Plan is finalized or when the response actions have been completed. The property owner is responsible for having institutional controls recorded against the property, so the timing needs to be considered for projects involving property sales. For determining the appropriate notification and institutional control, four categories are generally used:

No Notification or Institutional Control is required when the environmental conditions and property history indicate there is no man-made release to the environment.

Assurance Letter Notifications are brief statements in No Association Determination and No Action/No Further Action Letters issued by the MPCA describing contamination remaining on the property. They are used for properties with remaining releases present at concentrations below standards and criteria for the current and known future property use, but additional investigation and cleanup may be necessary if the contaminated media is disturbed, or land use changes.

Affidavits Concerning Real Property Contaminated with Hazardous Substances (Real Property Affidavits) are documents signed and acknowledged by a property owner which state that the land has been used to dispose of hazardous substances or that the land is contaminated by a release of a hazardous substance and are recorded in the Office of the County Recorder or Registrar of Titles. Real Property Affidavits are used for properties with remaining contamination at concentrations above standards and criteria, and only limited maintenance or short-term monitoring is required.

Uniform Environmental Covenant and Easements (Environmental Covenants) are documents recorded in the Office of the County Recorder or Registrar of Titles and serve as a readily available reminder to a current property owner and notice to future owners that conditions at a property need to be maintained in order to protect human health and the environment from an existing release. They are used for properties with remaining contamination at concentrations above standards and criteria with long-term maintenance and monitoring requirements.

Additional information and examples of Assurance Letter Notifications, Real Property Affidavits, Environmental Covenants, local requirements, access agreements, and easements are below and also are presented in the Attachments and Figures located at the end of this document.

6.1 Assurance Letter Notifications

An Assurance Letter Notification is a brief statement describing the known contamination remaining at a property at the time the assurance letter is issued. Notifications are used when no Real Property Affidavit or Environmental Covenant is recorded against the property, but the property owner should be aware that contamination is present that may require risk management if future, as yet unplanned, actions require disturbing the contaminated media or increase access to contaminated media. **An owner of a property with an environmental release has ongoing risk management obligations even when the release concentrations are below standards and criteria requiring response actions for the current and planned land use.** Typically, an assurance letter notification is included in the following assurances:

- No Action Letters for releases that are below response action criteria for the current and planned property use, but future land use changes or disturbance of the releases may require additional investigation in order to determine whether response actions are necessary in order to manage risk
- No Further Action Determinations for releases that have been cleaned up to below criteria for additional response actions based on the current and planned property use, but the property may need additional investigation or response actions if future health risks change due to land use changes or disturbance of the releases
- No Association Determination or Retroactive No Association Determinations, in cases where a non-responsible voluntary party does not request No Action or No Further Action Determination, or the property does not qualify for a No Action or No Further Action Determination

Some examples of situations where an assurance letter notification may be used are:

- A property where municipal water is used, but the groundwater is contaminated and may require special treatment or handling if, in the future, the owner decides to conduct groundwater extraction for drainage control, construction or landscape maintenance
- Soil vapors are below response action criteria for all existing buildings and planned buildings in the area of a release, but additional investigation and/or response actions may be necessary in the future if the owner decides to construct additional buildings or occupied structures
- An industrial property with a soil release at concentrations below industrial soil reference values (SRVs) which may in the future have excess excavated soil that needs off-site reuse or disposal, or may be redeveloped as residential property in the future

Assurance letter notifications are not intended to describe all potential situations that may occur at the property, because it is impractical to predict all potential future uses of a property or actions at a property that may require risk reduction or management. If actions are planned that may disturb a release or increase access to a release, an environmental consultant should be consulted.

A condition of assurance letters is that current and future property owners cooperate with and grant access to the MPCA and MPCA contractors in the event of future investigations of a release or response actions. Copies of issued assurance letters are available from the MPCA.

6.2 Local requirements and land use planning tools

Requirements and planning tools of local units of government, such as city planning departments and watershed districts, often implement land use restrictions or best management practices related to environmental releases. Examples are zoning codes, building permits, well advisories, and special well construction areas.

6.3 Institutional controls

Institutional controls typically used by the VIC, Superfund and RCRA Corrective Action programs are Real Property Affidavits and Environmental Covenants.

6.3.1 Real Property Affidavits

Real Property Affidavits are documents pursuant to Minn. Stat. § 115B.16, which state that the land has been used to dispose of hazardous substances or that the land is contaminated by a release of a hazardous substance. Real Property Affidavits are signed and acknowledged by a property owner, contain a legal description of the property, include a description of the nature and location of the release, and are recorded in the Office of the County Recorder or Registrar of Titles where the property is located. A Real Property Affidavit typically contains:

- MPCA historical involvement in the oversight of response actions and ongoing risk management
- Any ongoing requirements for operation and/or monitoring of the response actions
- A statement that the MPCA needs to be contacted in the event of planned land use changes, new environmental information is available, or an activity is planned that may interfere with risk management measures

Real Property Affidavits do not include ongoing submittal of reports to the MPCA.

A Real Property Affidavit template is located on the MPCA website at <https://www.pca.state.mn.us/sites/default/files/c-rem4-02.doc>. An additional Real Property Affidavit may be recorded by the property owner if additional investigation or response actions indicate significant changes in the nature, magnitude or extent of the release or modifications are made to response action maintenance or monitoring.

Other types of Real Property Affidavits may be used for various purposes, such as an affidavit pursuant to Minn. Stat. § 116.48 relating to tank releases or an affidavit pursuant to Minn. Stat. § 17.135 relating to the disposal of solid waste. Other notifications are found in MPCA rules at Minn. R. 7045.0496 and 7045.0494 pertaining to the closure of hazardous waste disposal sites.

6.3.2 Environmental Covenants

An Environmental Covenant is a document pursuant to Minn. Stat. ch. 114E that is recorded in the Office of the County Recorder or Registrar of Titles against real property. An Environmental Covenant serves as a readily available reminder to a current property owner and notice to future owners that conditions at a property need to be maintained in order to protect human health and the environment from an existing release. The required contents of Environmental Covenants are set forth in Minn. Stat. § 114E.15, and include activity and use limitations on real property. Examples of activity and use limitations might include restrictions against the use of property for residential purposes, or a requirement to refrain from disturbance of soil on the property. Environmental Covenants also must contain a legal description of the property as well as a signature and acknowledgement for every owner of the fee simple title to the property, the MPCA, and any additional holders of the Environmental Covenant. Other contents of Environmental Covenants include:

- A brief narrative description of the contamination and environmental response project, including the contaminants of concern, the pathways of exposure, limits on exposure, and the location and extent of the contamination
- Requirements for the submission of annual reports describing compliance with the covenant

- A grant of an easement for access to the property in connection with implementation or enforcement of the covenant
- Requirements to provide notice of any transfer of the property, proposed changes in the use of the property, applications for building permits, or proposals for any site work affecting the contamination or the environmental response project
- Other terms pertaining to enforcement of the covenant, amendment or termination of the covenant, and subordination of prior interests in the real property

A template for an Environmental Covenant is located on the MPCA website at <https://www.pca.state.mn.us/sites/default/files/c-rem4-03.pdf>.

6.4 Property easements

Easements may be used to grant the MPCA an interest in real property, are signed by the MPCA and property owner, and recorded against the property. Examples of MPCA uses for easements include:

- Crossing property to conduct monitoring
- Entering property to conduct inspections
- Maintaining and sampling monitoring wells
- Conducting long term response actions and/or monitoring
- Maintaining a pump-out well to control contaminant migration to a water supply well

6.5 Access agreements

Access Agreements are two-party documents between a property owner and the MPCA granting the MPCA and MPCA contractors access to property to conduct specific activities such as inspections, investigations, well sampling and maintenance, or installation of vapor mitigation systems. An Access Agreement does not give the MPCA an interest in the property, and the document is not recorded. A template for access agreements is available on the MPCA website <https://www.pca.state.mn.us/sites/default/files/c-rem4-01.doc>.

7.0 Land use categories and risk management

Land Use Categories are used when contamination from an environmental release remains after any response actions. Land Use categories:

- Indicate appropriate uses of a property that meet specific requirements regarding residual contamination and recommended notifications and institutional controls (provided in Attachments A, B, and C)
- Are specific exposure scenarios applicable to both human health and ecological receptors present at properties representative of a specific land use category

Exposure scenarios vary depending on the type of receptor being evaluated (human or ecological) and the media (soil, soil vapor, groundwater, sediment, or surface water). Details on how specific land use categories are used in a media-specific evaluation are provided in the media-specific guidance documents.

For situations where the planned land use does not fit neatly into one or more categories, the response actions and institutional controls can be adjusted to fit the site-specific scenario. Risk management examples below represent common minimum remediation options that require:

- An Environmental Covenant recorded against the property
- The property owner and responsible party to avoid any future activities that may disturb remaining contaminated media or interfere with ongoing response actions
- The property owner and/or responsible party to notify the MPCA and submit a work plan for MPCA review and approval in the event that future activities are planned which may disturb remaining contaminated media (for example underground utility installation and repairs, construction of a building addition, groundwater extraction for landscaping irrigation)
- The property owner to maintain the property (including rental property) as described in the Environmental Covenant, including required pavements or soil cover, vapor mitigation systems, utility corridor soil and other engineered monitoring or controls

The minimum remediation examples do not apply to all situations. Responsible parties and non-responsible parties usually have the option to choose more extensive response actions with no or fewer long term responsibilities. For all Land Use Categories, in addition to state and federal requirements, local ordinances, policies, and requirements apply. The property owner and managers are responsible for taking actions to prevent future releases and reporting any releases that become evident after response actions have been completed.

7.1 Residential/Recreational – Single Family Homes Land Use Category (R/R-Single Family Homes)

R/R-Single Family Homes refers to single family homes which are owned and managed by an individual or a family that reside at the property. Planned and future land use may include common urban, suburban, and rural home attributes including an occupied house with basement, water well, underground utility service lines, garden, landscaping, rain garden, in-ground cement swimming pool, and small surface water features such as a wetland, pond or ditch. It is assumed a property owner may do some of their own work on the property rather than rely solely on professionals. Long term operation, monitoring and maintenance of water treatment and vapor mitigation systems, engineered controls and institutional control requirements is usually the responsibility of the property owner.

7.2 Residential/Recreational – Multi-Family Housing and Other Areas Land Use Category (R/R Multi-Family Housing and Other Areas)

R/R Multi-Family Housing and Other Areas properties are similar to R/R –Single Family Homes, except that the properties are managed by a landlord, an association, business, or local government agency and are typically occupied or used by multiple individuals or families. Examples are townhomes, senior housing and care facilities, child and adult day care centers, apartments with retail or service stores, schools, hospitals, churches, and community centers. Property management groups operating Multi-Family Housing and Other Areas property are expected to have control over property use and maintenance, and use professional maintenance staff or contractors. Long term operation, monitoring, and maintenance of water treatment and vapor mitigation systems, engineered controls and institutional control requirements is usually the responsibility of the property management group or owner.

7.3 Residential/Recreational – Recreational Land Use Category (R/R-Recreational)

R/R Recreational properties are open green-spaces and recreational developed properties accessible to the general public. Examples are playgrounds, sports fields, stadiums, outdoor amphitheaters, campgrounds, community parks, beaches, wildlife areas, state forests, and paved or unpaved trails for hiking, biking, horseback riding, and all-terrain vehicles. Soil remediation depths will vary greatly with specific recreational use, types of surface water bodies, and ecological populations present. Ecological risk criteria generally apply. Residential/recreational SRVs are typically used for locations where human use is a priority and when ecological risk criteria are not available. Long term operation, monitoring, and maintenance of water treatment and vapor mitigation systems, engineered controls, and institutional control requirements are usually the responsibility of the property owner.

7.4 Commercial/Industrial Land Use Category (Commercial/Industrial)

Commercial/Industrial includes commercial and industrial properties where access by the general public is restricted and there are no recreational or residential facilities for the general public. Examples are retail stores, shopping malls, restaurants, motels, office buildings, manufacturing facilities, public utilities, railroad properties, warehouses, wholesale stores, and scrapyards. Businesses operating commercial or industrial property are expected to have control over land use and maintenance, and use professional maintenance staff or contractors. Long-term operation, monitoring, and maintenance of water treatment and vapor mitigation systems, engineered controls, and institutional control requirements is usually the responsibility of the property owner or operator.

8.0 Other requirements and considerations for land use and risk management

The risk-based requirements by land use outlined in Attachments A, B, and C present broad requirements that are considered when determining site-specific requirements. Often additional requirements and considerations will dictate specific requirements that may affect land use restriction decisions. Some common requirements and considerations are briefly discussed below.

8.1 Special wastes

Special wastes are waste materials that, in addition to MERLA, have requirements under other statutes and regulations and are assigned specific testing, management, remediation and disposal methods and procedures.

Principal threat wastes are types of special waste materials that are ongoing sources of contamination that leach to groundwater or surface water, volatilize or otherwise become entrained in air, or are a risk by direct exposure. Requirements for principal threat wastes are described in the National Contingency Plan and U.S. Environmental Protection Agency guidance. The MPCA requires remediation of ongoing sources of significant contamination and in general MPCA requirements meet the requirements of the National Contingency Plan.

RCRA listed and characteristic hazardous wastes, Asbestos Containing Waste Materials, explosives, and polychlorinated biphenyls are examples of wastes that have specific sampling, characterization, reporting, handling and/or disposal requirements under federal laws and regulations. State and federal guidance for these wastes are used in determining appropriate response action options and land use restrictions.

Buried special wastes that are mobile or will likely be mobile in the future, are remediated at any depth and for any land use, where feasible. Buried special wastes that are less mobile are often remediated at any depth for all land use types, because they require long term tracking under an Environmental Covenant and often need to be removed some time in the future at a greater cost.

Limited special wastes are not feasible or reasonable to remove or treat, and may be allowed to remain in-place based on a site-specific evaluation. Usually an Environmental Covenant is required for ongoing monitoring and response actions, and land use is restricted. An example of a limited special waste is special waste buried under a building or pipeline.

8.2 Buried solid wastes

Buried solid wastes that may cause a release of hazardous substances, pollutants or contaminants to soil, soil vapor, groundwater, or surface water are removed for any land use where feasible. Solid wastes excavated for remediation or construction purposes are not reburied at the property. The MPCA may approve, on a site-specific basis, the consolidation of solid waste in order to reduce the footprint of a dump or landfill; this requires:

- Prior approval by the MPCA Solid Waste Program
- Any necessary disposal permits

- Solid wastes containing hazardous substances, pollutants, or contaminants are reburied within the footprint of the original buried waste area in order to prevent an increase in the extent of the release

Properties where buried solid wastes remain on-site will be required to have a Real Property Affidavit or Environmental Covenant, and additional response actions such as a soil cover or engineered controls. The MPCA Solid Waste Program may require a permit for solid wastes to remain buried on-site.

Recycling and reuse of some inert solid wastes as a substitution for an engineered product (such as crushed concrete used for pavement sub-base) is encouraged for appropriate situations. Property notifications and institutional controls are not required, because the solid wastes are substituted for useful products rather than placed for disposal. The MPCA Solid Waste Beneficial Reuse Program requirements need to be followed <https://www.pca.state.mn.us/waste/standing-beneficial-use-determinations>.

8.3 Soil Maintenance Zones

Soil Maintenance Zones (also known as buffer zones) are required to facilitate typical future property maintenance and repairs with minimal or no future response actions, and to reduce the risk of contaminated soil excavated for repairs being used on the property ground surface. Notifications and institutional controls are used to document the required maintenance of Soil Maintenance Zones. Soil Maintenance Zones consist of soil that meets all of the following requirements:

- Either no contaminants or contamination concentrations below the SRVs for the Accessible Zone in the appropriate Land Use Category, or site-specific cleanup values
- Contamination concentrations below the SLVs, or contaminants that do not leach to groundwater in concentrations above the health risk limits (HRLs), maximum contaminant levels (MCLs), Health Based Values, and other state and federal standards and criteria at the location of buffer use (for example, soil used beneath maintained impervious pavement)
- Contaminant concentrations that do not cause leaching to surface water at concentrations above the applicable surface water standards and criteria
- Contaminant concentrations are below levels that may cause vapor intrusion at concentrations above MPCA action criteria
- No or *de minimis* amounts of solid waste including trash, ash, cinders, clinkers, and demolition debris
- No listed or characteristic RCRA hazardous waste or principal threat wastes

A Soil Maintenance Zone consisting of a minimum of two feet of soil meeting the requirements listed above is required under all newly constructed impervious surfaces, except where an impervious surface already exists. This includes soil beneath building foundations, vertically along foundation walls, and under new pavements and new roads. Crushed cement used as pavement sub-base is considered part of this two feet of soil however; crushed asphalt used as pavement sub-base is a leachable product and is not considered part of the two feet of soil. All roads and pavements owned and maintained by the Minnesota Department of Transportation (MnDOT) are considered one entity; commercial/industrial SRVs are generally used to determine the two feet of soil for MnDOT Soil Maintenance Zones.

Utility corridors with utility lines located beneath the Accessible Zone need to be entirely backfilled with soil that meets the requirements for a Soil Maintenance Zone in the Accessible Zone. Utility bedrock tunnels constructed for human access for maintenance purposes need to be tested for vapor intrusion and contaminant vapors from environmental releases need to be less than MPCA requirements for vapor mitigation. In order for information to be available to utility workers, a Real Property Affidavit or

Environmental Covenant is typically required for properties with utility corridors at any depth that do not have Soil Maintenance Zones or that have elevated concentrations of soil vapors in utility tunnels.

A Soil Maintenance Zone of two feet is typically used beneath recreational trails, with the two feet measured from the base of the disturbed zone determined by how much the soil is expected to erode based on the specific use of the trail.

ATTACHMENT A
NOTIFICATIONS, INSTITUTIONAL CONTROLS AND ACCESS
Residential/Recreational – Single Family Home
Land Use Category

The following are generalizations to be used as typical examples. Evaluations of actual site-specific conditions are used in determining appropriate risk management actions and type of notification or institutional control.

No Institutional Control or Notification

- No environmental release was detected or remediation of all releases has resulted in a permanent cleanup with contaminant levels expected to decrease to natural background levels therefore:
 - Soil, groundwater, soil vapor, surface water and sediment contamination are at or below background levels
 - Soil is free from or has only *de minimis* amounts of solid wastes at all depths
 - Soil has no special wastes at all depths

Assurance Letter Notification

- Low level contaminants from an environmental release are present above natural background levels in one or more environmental media and are not expected to affect the Current Land Use and Planned Land Use, but possibly may affect one or more aspects of Future Land Use
- Conditions generally meet the following:
 - Soil contaminant levels at all depths are below Residential/Recreational SRVs, background threshold values (BTVs) or site-specific cleanup values
 - Soil is free from or has only *de minimis* amounts of solid wastes at all depths
 - Soil has no special wastes at all depths
 - Soil contaminants associated with groundwater contaminants are below SLVs or are not contributing to groundwater contamination
 - Groundwater contaminant levels are below HRLs, MCLs or other state and federal standards and criteria for drinking water
 - Soil vapor levels are below action levels for current property conditions
 - Soil vapor levels are above action levels, and active vapor mitigation system is installed and has long-term maintenance and monitoring not under the oversight of the MPCA
 - Surface water and sediment contaminant levels are below state and federal standards and criteria

Real Property Affidavit

- Contamination from an environmental release remains and may affect one or more aspects of Current Land Use and Planned Land Use
- Conditions generally meet the following:
 - Soil contaminant levels in Accessible and Potentially Accessible zones are below R/R SRVs, BTVs or site-specific cleanup values
 - Remotely Accessible Zone may have soil contamination above Residential/Recreational SRVs, BTVs or site-specific cleanup values
 - Accessible and Potentially Accessible zones are free from or have only *de minimis* amounts of solid wastes
 - Accessible and Potentially Accessible zones are free from special wastes
 - Remotely Accessible Zone may have limited solid waste, but no special wastes

- Soil contaminant levels exceed the SLVs and are associated with existing groundwater contamination that require limits on infiltration, including engineered controls
- Groundwater contaminant levels are above HRLs, MCLs or other state and federal standards and criteria for drinking water requiring an alternate source of household water or treatment to a level meeting drinking water standards and criteria
- Groundwater use is limited to irrigation or water level control
- Soil vapor levels are above action levels for active mitigation systems in current and planned buildings, but mitigation systems were not installed
- Surface water and sediment contaminant levels are above state and federal standards and criteria requiring limited or short-term monitoring and maintenance of engineered controls

Environmental Covenant

- Contamination from an environmental release remains and requires ongoing monitoring, maintenance and/or reporting to the MPCA for Current, Planned and possibly Future Land Use
- Conditions generally meet the following:
 - Soil contaminant levels in Accessible and Potentially Accessible zones are below Residential/Recreational SRVs, BTVs or site-specific cleanup values
 - Soil in the Remotely Accessible Zone may exceed Residential/Recreational SRVs, BTVs or site-specific cleanup values
 - Accessible and Potentially Accessible zones are free from or have only *de minimis* amounts of solid wastes
 - Accessible and Potentially Accessible zones are free from special wastes
 - Remotely Accessible Zone may have solid and/or limited special wastes that require long-term cover maintenance or other engineered controls, or long-term monitoring
 - Soil contaminants exceed the SLVs and are associated with existing groundwater contamination that requires limits on infiltration, including engineered controls
 - Groundwater contaminant levels are above HRLs, MCLs or other state and federal standards and criteria for drinking water requiring ongoing water treatment, long-term monitoring, and maintenance
 - For a soil or groundwater release that requires an Environmental Covenant, any active vapor mitigation systems in current and planned buildings on the property, required due to elevated soil vapors from the release, will typically be included in the Environmental Covenant
 - Surface water and sediment contaminant levels are above state and federal standards and criteria that require ongoing maintenance of engineered controls, long-term monitoring, or restricted access or land use

Easement or Access Agreement

- Easement or Access Agreement if maintenance and monitoring is required by parties other than the property owner

Government Agency Designated Areas of Concern

- A Well Advisory or Special Well Construction Area designation may be requested by the MPCA for regional releases in groundwater
- Surface Water may be designated an Impaired Water if water quality standards are not met for the designated water use
- Fish Consumption Advisories may be designated in areas of surface water contamination based on fish condition

ATTACHMENT B
NOTIFICATIONS, INSTITUTIONAL CONTROLS AND ACCESS
Residential/Recreational – Multi-Family Housing and Other Uses and
Residential/Recreational – Recreational
Land Use Categories

The following are generalizations to be used as typical examples. Evaluations of actual site-specific conditions are used in determining appropriate risk management actions and type of notification or institutional control.

No Institutional Control or Notification

- No environmental release was detected or remediation of all releases has resulted in a permanent cleanup with contaminant levels expected to decrease to natural background levels therefore:
 - Soil, groundwater, soil vapor, surface water and sediment contamination are at or below background levels
 - Soil is free from or has only *de minimis* amounts of solid wastes at all depths
 - Soil has no special wastes at all depths

Assurance Letter Notification

- Low level contaminants from an environmental release are present above natural background levels in one or more environmental media and are not expected to affect the Current or Planned Land Use, but possibly may affect one or more aspects of Future Land Use
- Conditions generally meet the following:
 - Soil contaminant levels at all depths are below Residential/Recreational SRVs, BTVs or site-specific cleanup values
 - Soil is free from or has only *de minimis* amounts of solid wastes at all depths
 - Soil has no special wastes at all depths
 - Soil contaminants associated with groundwater contaminants are below SLVs or are not contributing to groundwater contamination
 - Groundwater contaminant levels are below HRLs, MCLs or other state and federal standards and criteria for drinking water
 - Soil vapor levels are below action levels for current property conditions
 - Surface water and sediment contaminant levels are below state and federal standards and criteria

Real Property Affidavit

- Contamination from an environmental release remains and may affect one or more aspects of Current Land Use and Planned Land Use
- Conditions generally meet the following:
 - Soil contaminant levels in Accessible and Potentially Accessible zones are below Residential/Recreational SRVs, BTVs or site-specific cleanup values
 - Remotely Accessible Zone may have soil contamination above Residential/Recreational SRVs, BTVs or site-specific cleanup values
 - In recreation areas, ecological criteria are used in addition to SRVs where appropriate
 - Accessible and Potentially Accessible zones are free from or have only *de minimis* amounts of solid wastes
 - Accessible and Potentially Accessible zones are free from special wastes
 - Remotely Accessible Zone may have solid waste, but not special wastes

- Soil contaminants exceed the SLVs and are associated with existing groundwater contamination requiring limits on infiltration, including engineered controls
- Groundwater contaminant levels are above HRLs, MCLs or other state and federal standards and criteria for drinking water requiring an alternate source of drinking water or treatment to a level meeting drinking water standards and criteria
- Groundwater use that is limited to irrigation or water level control
- Soil vapor levels requiring the use of active vapor mitigation systems in current and planned buildings
- Surface water and sediment contaminant levels are above state and federal standards and criteria requiring limited or short-term monitoring and maintenance of engineered controls

Environmental Covenant

- Contamination from an environmental release remains and requires ongoing monitoring, maintenance and/or reporting to the MPCA for Current, Planned and possibly Future Land Use
- Conditions generally meet the following:
 - Soil contaminant levels in the Accessible Zone are below Residential/Recreational SRVs, BTVs or site-specific cleanup values
 - Soil in the Accessible zone beneath pavement and trails and soil in the Potentially and Remotely Accessible zones may exceed Residential/Recreational SRVs, BTVs or site-specific cleanup values below a 2 feet Soil Maintenance Zone
 - In recreation areas, ecological criteria are used in addition to SRVs where appropriate.
 - Accessible zone is free from or has only *de minimis* amounts of solid wastes
 - Accessible zone is free from special wastes
 - Potentially and Remotely Accessible zones may have solid and/or limited special wastes that require cover maintenance or other engineered controls, or long-term monitoring
 - Soil contaminants exceed the SLVs and are associated with existing groundwater contamination requiring limits on infiltration, including engineered controls to prevent off-site migration
 - Groundwater contaminant levels are above HRLs, MCLs or other state and federal standards and criteria for drinking water requiring ongoing water treatment, long-term monitoring, and maintenance, possibly with reporting to the MPCA
 - For a soil or groundwater release that requires an Environmental Covenant, any active vapor mitigation systems in current and planned buildings on the property, required due to elevated soil vapors from the release, will typically be included in the Environmental Covenant
 - Surface water and sediment contaminant levels are above state and federal standards and criteria requiring ongoing maintenance of engineered controls, long-term monitoring, or restricted access or land use

Easement or Access Agreement

- Easement or Access Agreement if maintenance and monitoring is required by parties other than the property owner

Government Agency Designated Areas of Concern

- A Well Advisory or Special Well Construction Area designation may be requested by the MPCA for regional releases in groundwater
- Surface Water may be designated an Impaired Water if water quality standards are not met for the designated water use
- Fish Consumption Advisories may be designated in areas of surface water contamination based on fish condition

ATTACHMENT C
NOTIFICATIONS, INSTITUTIONAL CONTROLS AND ACCESS
Industrial/Commercial Land Use Category

The following are generalizations to be used as typical examples. Evaluations of actual site-specific conditions are used in determining appropriate risk management actions and type of notification or institutional control.

No Institutional Control or Notification

- No environmental release was detected or remediation of all releases has resulted in a permanent cleanup with contaminant levels expected to decrease to natural background levels therefore:
 - Soil, groundwater, soil vapor, surface water and sediment contamination are at or below background levels
 - Soil is free from or has only *de minimis* amounts of solid wastes at all depths
 - Soil has no special wastes at all depths

Assurance Letter Notification

- Low level contaminants from an environmental release are present above natural background levels in one or more environmental media and are not expected to affect the Current or Planned Land Use, but possibly may affect one or more aspects of Future Land Use
- Conditions generally meet the following:
 - Soil contaminant levels at all depths are below Industrial/Commercial SRVs, BTVs or site-specific cleanup values
 - Soil is free from or has only *de minimis* amounts of solid wastes at all depths
 - Soil has no special wastes at all depths
 - Soil contaminants associated with groundwater contaminants are below SLVs or are not contributing to groundwater contamination
 - Groundwater contaminant levels are below HRLs, MCLs or other state and federal standards and criteria for drinking water
 - Soil vapor levels are below action levels for current property conditions
 - Surface water and sediment contaminant levels are below state and federal standards and criteria

Real Property Affidavit

- Contamination from an environmental release remains and may affect one or more aspects of Current Land Use and Planned Land Use
- Conditions generally meet the following:
 - Soil contaminant levels in Accessible and Potentially Accessible zones are below Commercial/Industrial SRVs, BTVs or site-specific cleanup values
 - Remotely Accessible Zone may have soil contamination above Commercial/Industrial SRVs, BTVs or site-specific cleanup values
 - Accessible and Potentially Accessible zones are free from or have only *de minimis* amounts of solid wastes
 - Accessible and Potentially Accessible zones are free from special wastes
 - Remotely Accessible Zone may have solid waste, but not special wastes
 - Soil contaminants exceed the SLVs and are associated with existing groundwater contamination that requires limits on infiltration, including engineered controls

- Groundwater contaminant levels are above HRLs, MCLs or other state and federal standards and criteria for drinking water requiring an alternate source of drinking water or treatment to a level meeting drinking water standards and criteria
- Groundwater use that is limited to irrigation or water level control
- Soil vapor levels requiring the use of active vapor mitigation systems in current and planned buildings
- Surface water and sediment contaminant levels are above state and federal standards and criteria requiring limited or short-term monitoring and maintenance of engineered controls

Environmental Covenant

- Contamination from an environmental release remains and requires ongoing monitoring, maintenance and/or reporting to the MPCA for Current, Planned and possibly Future Land Use
- Conditions generally meet the following:
 - Soil contaminant levels in the Accessible Zone are below Commercial/Industrial SRVs, BTVs or site-specific cleanup values
 - Soil in the Accessible zone beneath pavement and soil in the Potentially and Remotely Accessible zones may exceed Commercial/Industrial SRVs, BTVs or site-specific cleanup values below a 2 feet Soil Maintenance Zone
 - Accessible zone is free from or has only *de minimis* amounts of solid wastes
 - Accessible zone is free from special wastes
 - Potentially and Remotely Accessible zones may have solid and/or limited special wastes that require maintenance of cover or other engineered controls, or long-term monitoring
 - Soil contaminants exceed the SLVs and are associated with existing groundwater contamination requiring limits on infiltration, including engineered controls to prevent off-site migration
 - Groundwater contaminant levels exceed HRLs, MCLs or other state and federal standards and criteria for drinking water requiring ongoing water treatment, long-term monitoring, and maintenance, possibly with reporting to the MPCA
 - For a soil or groundwater release that requires an Environmental Covenant, any active vapor mitigation systems in current and planned buildings on the property, required due to elevated soil vapors from the release, will typically be included in the Environmental Covenant
 - Surface water and sediment contaminant levels above state and federal standards and criteria requiring ongoing maintenance of engineered controls, long-term monitoring, or restricted access or land use

Easement or Access Agreement

- Easement or Access Agreement if maintenance and monitoring is required by parties other than the property owner

Government Agency Designated Areas of Concern


- A Well Advisory or Special Well Construction Area designation may be requested by the MPCA for regional releases in groundwater
- Surface Water may be designated an Impaired Water if water quality standards are not met for the designated water use
- Fish Consumption Advisories may be designated in areas of surface water contamination based on fish condition


Figure A-1

Minimum Requirements for No Institutional Control or Notification

Residential/Recreational - Single Family Home

Surface Water and Sediment

 Surface Water at natural background concentrations

 Sediment at natural background concentrations

Soil Leaching

Soil at natural background concentrations


Groundwater

Groundwater at natural background concentrations

Vapor Intrusion

Soil vapor at natural background concentrations

Soil

 Soil at natural background concentrations no solid or special wastes

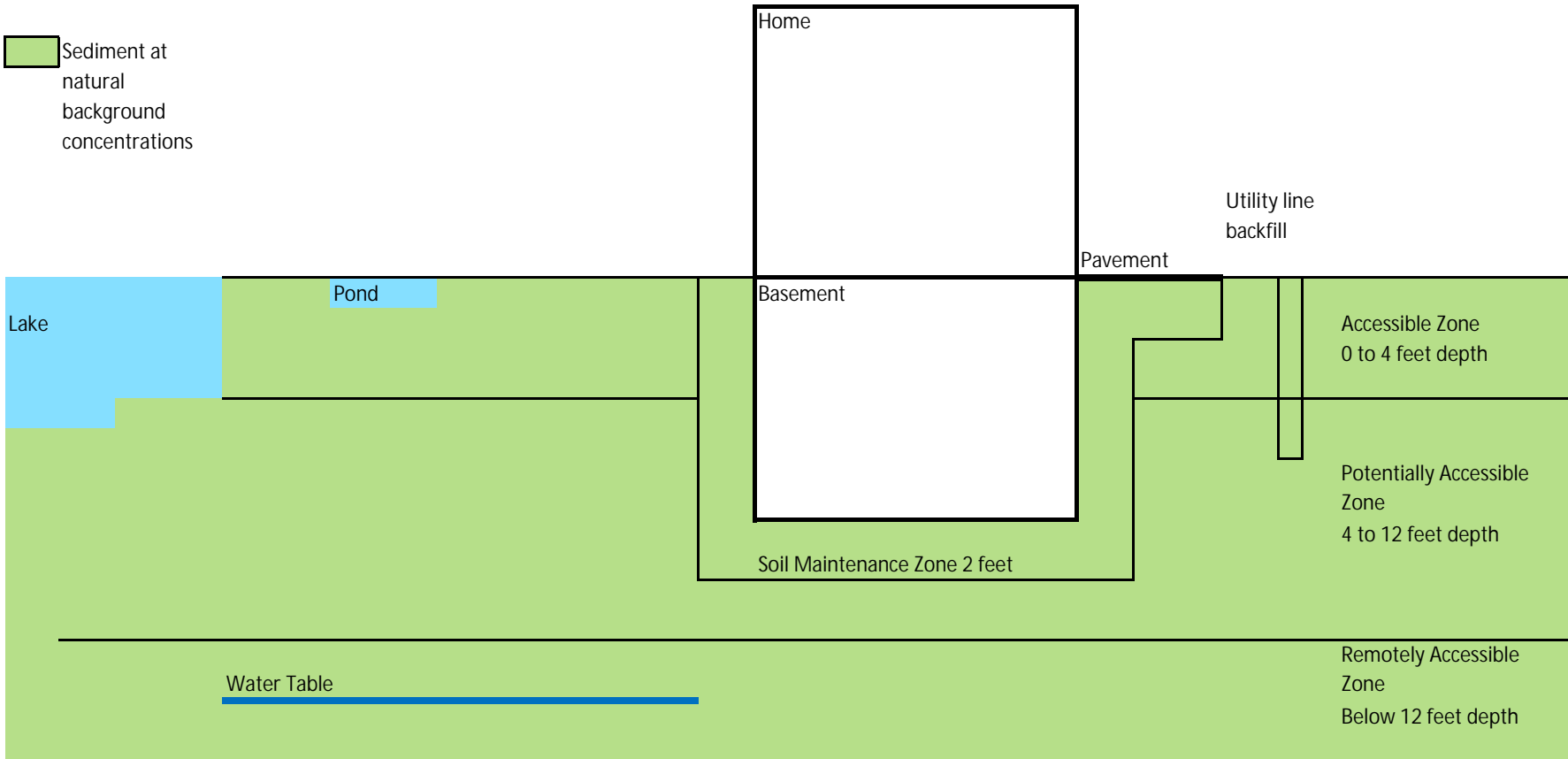


Figure A-2 Minimum Requirements for Assurance Letter Notification Residential/Recreational - Single Family Home

Surface Water and Sediment

Release identified Surface Water at concentrations below state and federal standards and criteria

Release identified Sediment concentrations below state and federal standards and criteria

Soil Leaching

Release identified Soil concentrations less than SLVs or groundwater not impacted by soil release

Groundwater

Release identified Groundwater concentrations less than HRLs, MCLs and other state and federal standards and criteria

Vapor Intrusion

Release identified, Soil vapor less than Action Levels
Active vapor mitigation system requires ongoing maintenance
Optional passive sub-slab venting system with no long term monitoring or little maintenance requirements

Soil

Release identified Soil concentrations less than residential SRVs, BTVs or site-specific cleanup values
Soil free from solid and special wastes

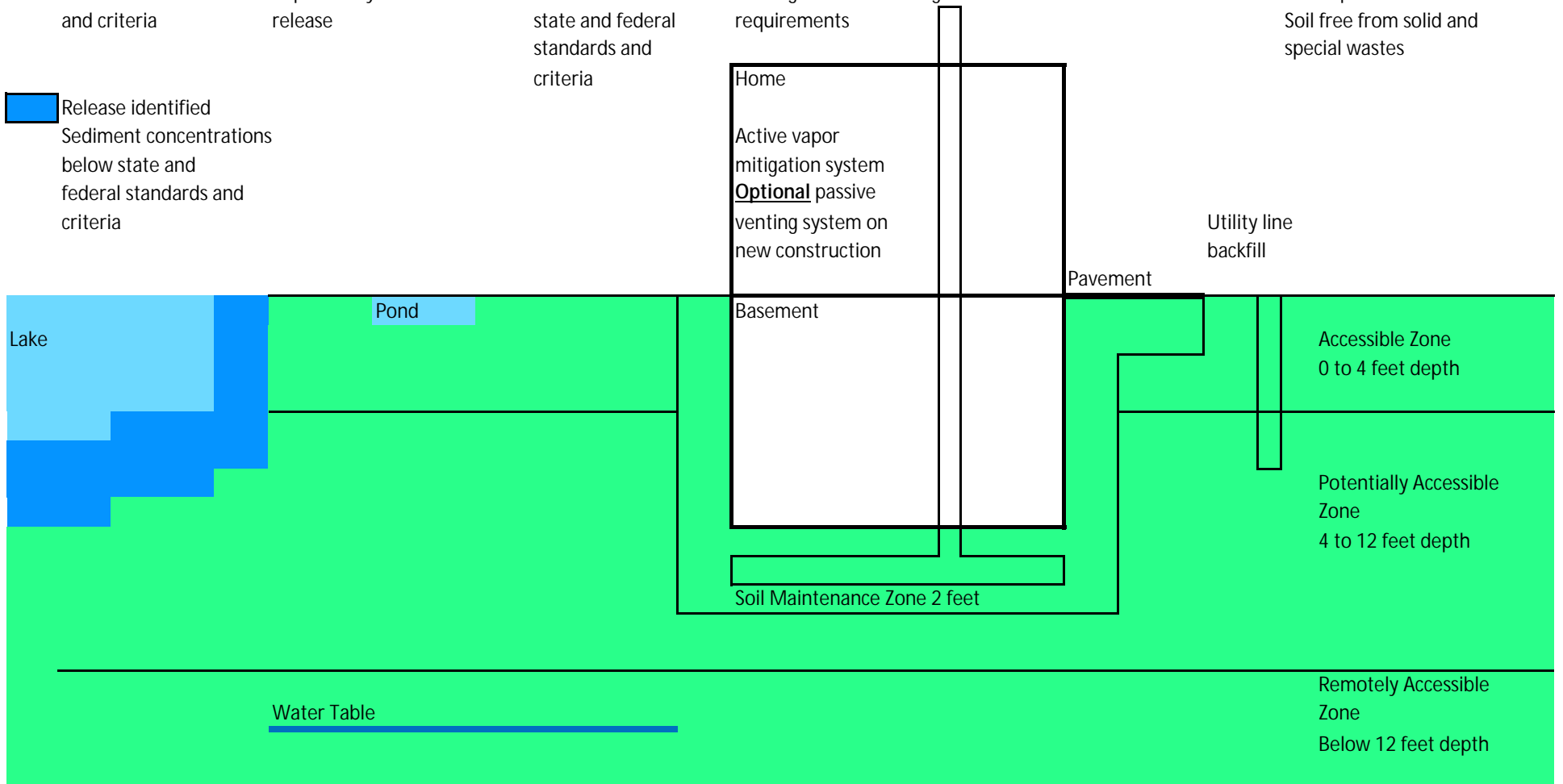




Figure A-3 Minimum Requirements for Real Property Affidavit Residential/Recreational - Single Family Home

Surface Water and Sediment

 Release identified Surface Water at concentrations above state and federal standards and criteria or ongoing maintenance of engineering controls

 Release identified Sediment concentrations above state and federal standards and criteria limited ongoing maintenance of engineering controls

Soil Leaching

Release identified Soil concentrations above SLVs and groundwater less than HRLs or MCLs or other state and federal standards and criteria after response actions and no long-term monitoring


Groundwater


Release identified Groundwater concentrations above HRLs, MCLs and other state and federal standards and criteria

Vapor Intrusion

Release identified Soil vapors above Action Levels Vapor Mitigation System required, but not installed

Soil

 Release identified Soil concentrations less than residential SRVs, BTVs or site-specific cleanup values No solid or special wastes

 Release identified Soil concentrations above residential SRVs Limited solid waste, No special wastes

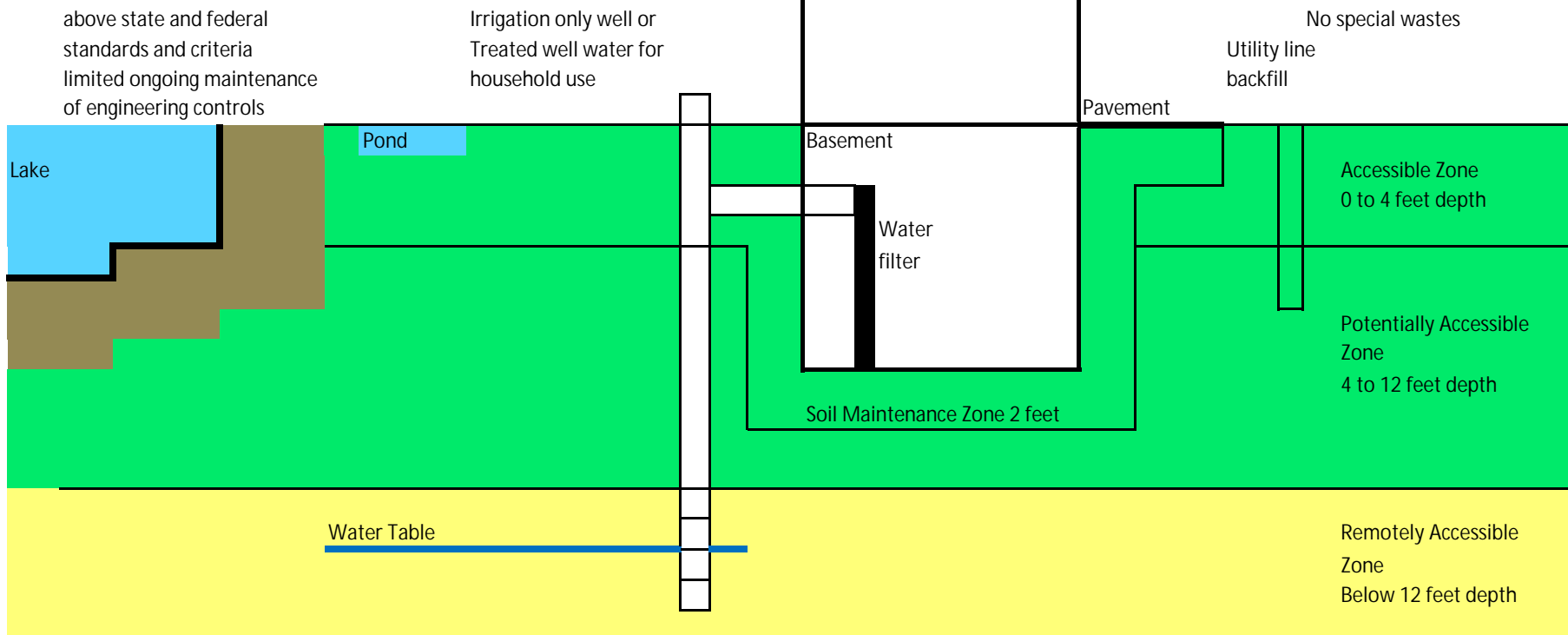


Figure A-4
 Minimum Requirements for Environmental Covenant
 Residential/Recreational - Single Family Home

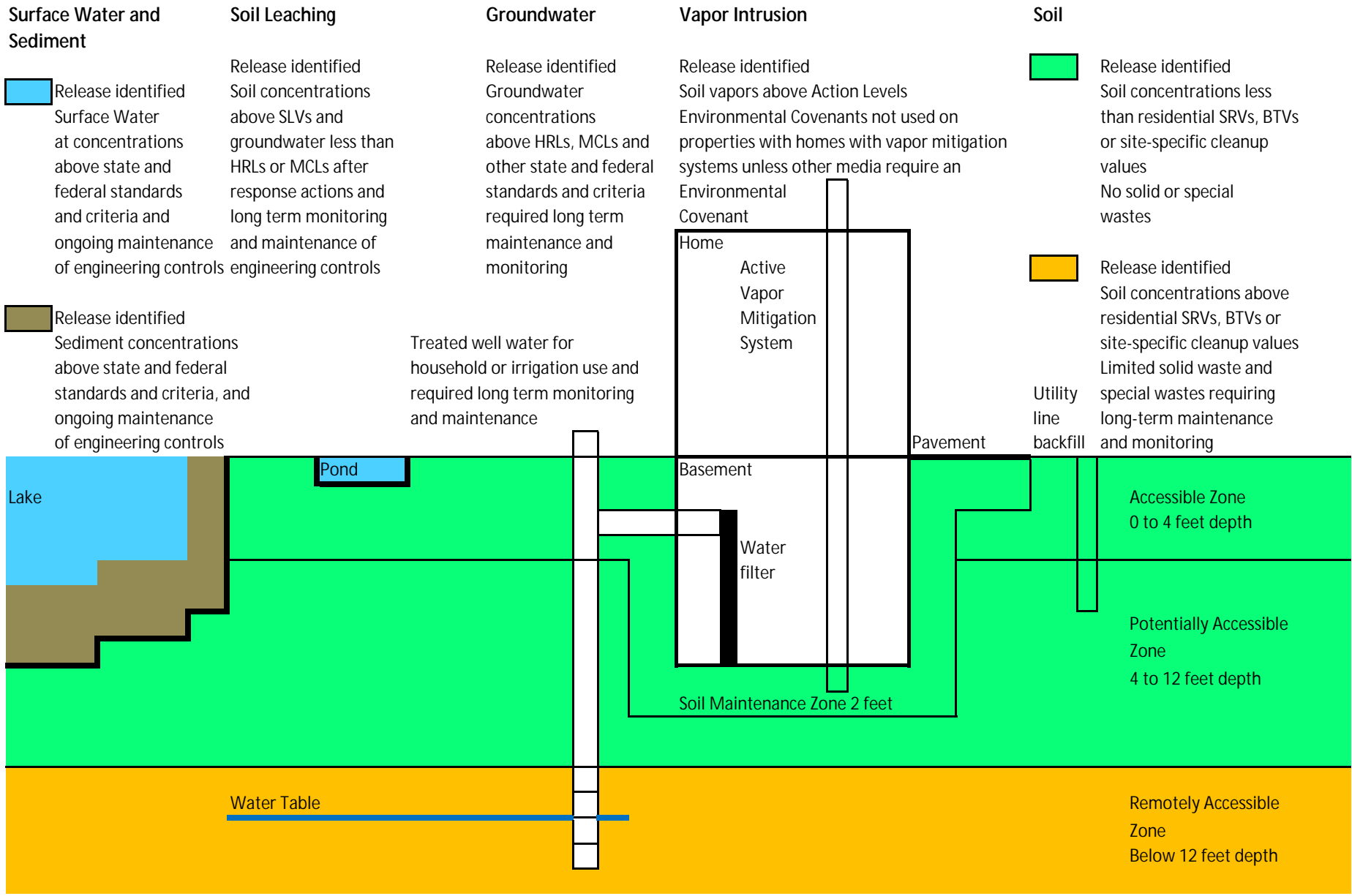



Figure B-1


Minimum Requirements for No Institutional Control or Notification

Residential/Recreational - Multi-Family Housing and Other Uses

Residential/Recreational - Recreational

Surface Water and Sediment

 Surface Water at natural background concentrations

 Sediment at natural background concentrations

Soil Leaching

Soil at natural background concentrations


Groundwater

Groundwater at natural background concentrations

Vapor Intrusion

Soil vapor at natural background concentrations

Soil

 Soil at natural background concentrations no solid or special wastes

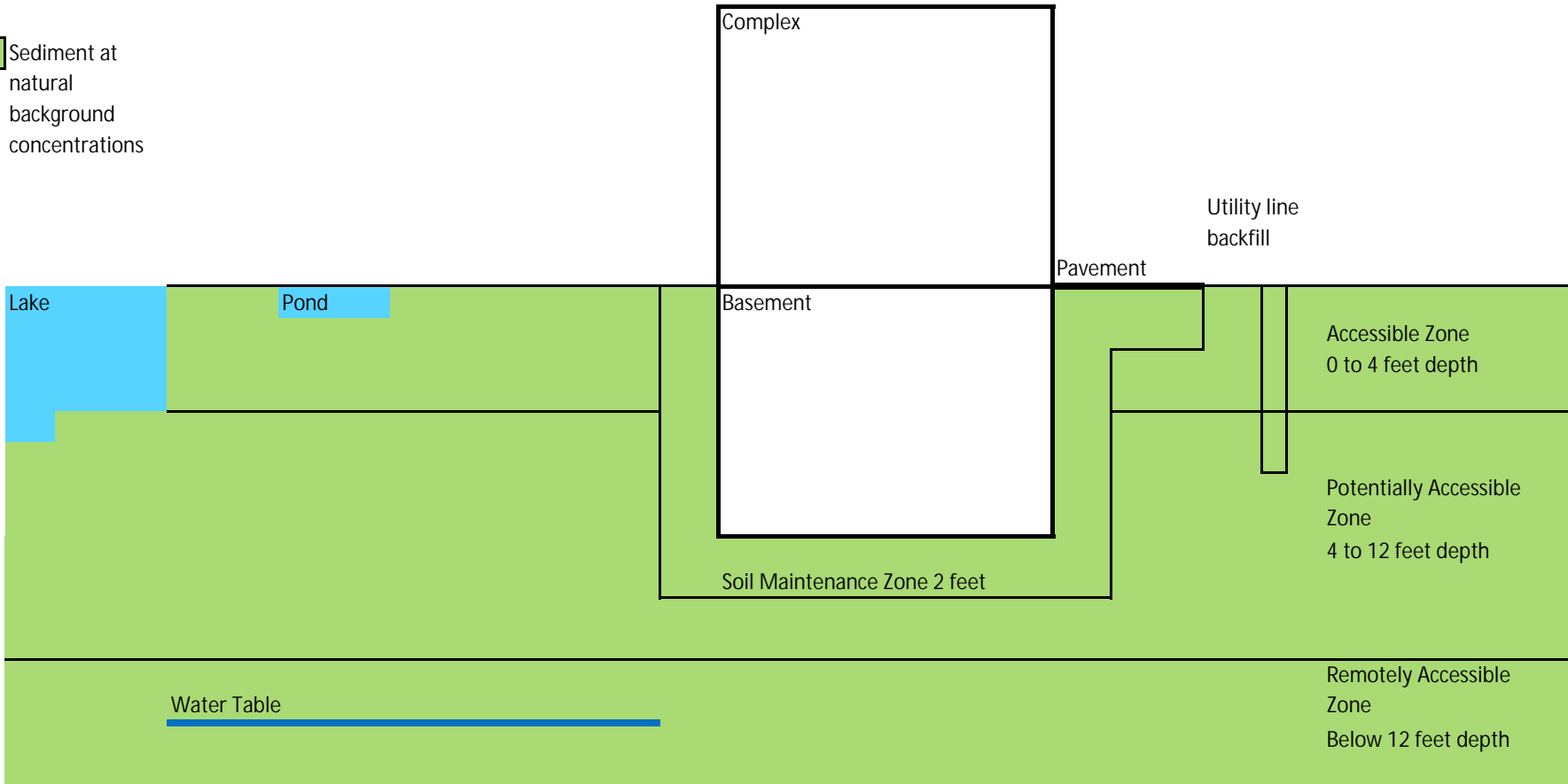


Figure B-2

Minimum Requirements for Assurance Letter Notification

Residential/Recreational - Multi-Family and Other Uses

Residential/Recreational - Recreational

Surface Water and Sediment

Release identified Surface Water at concentrations below state and federal standards and criteria

Release identified Sediment concentrations below state and federal standards and criteria

Soil Leaching

Release identified Soil concentrations less than SLVs or groundwater not impacted by soil release

Groundwater

Release identified Groundwater concentrations less than HRLs, MCLs and other state and federal standards and criteria

Vapor Intrusion

Release identified Soil vapor less than Action Levels
Optional passive sub-slab venting system with no long term monitoring or maintenance requirements

Soil

Release identified Soil concentrations less than residential SRVs, BTVs or site-specific cleanup values
 Soil free from solid and special wastes

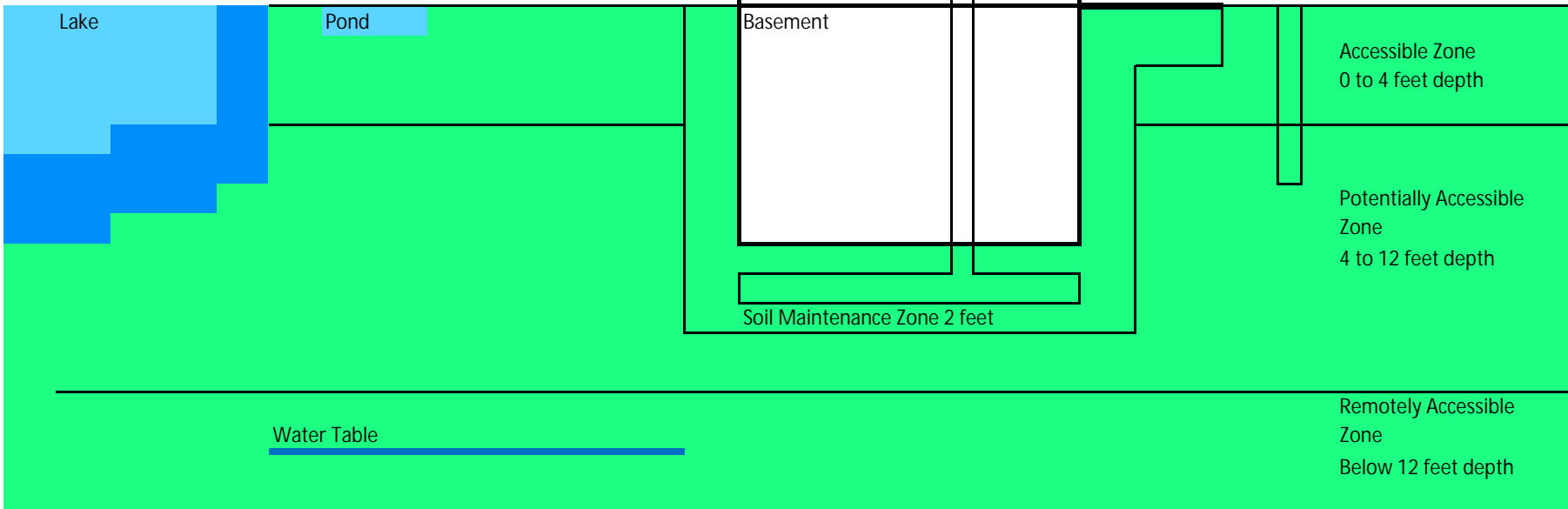


Figure B-3 Minimum Requirements for Real Property Affidavit Residential/Recreational - Multi- Family and Other Uses Residential/Recreational - Recreational

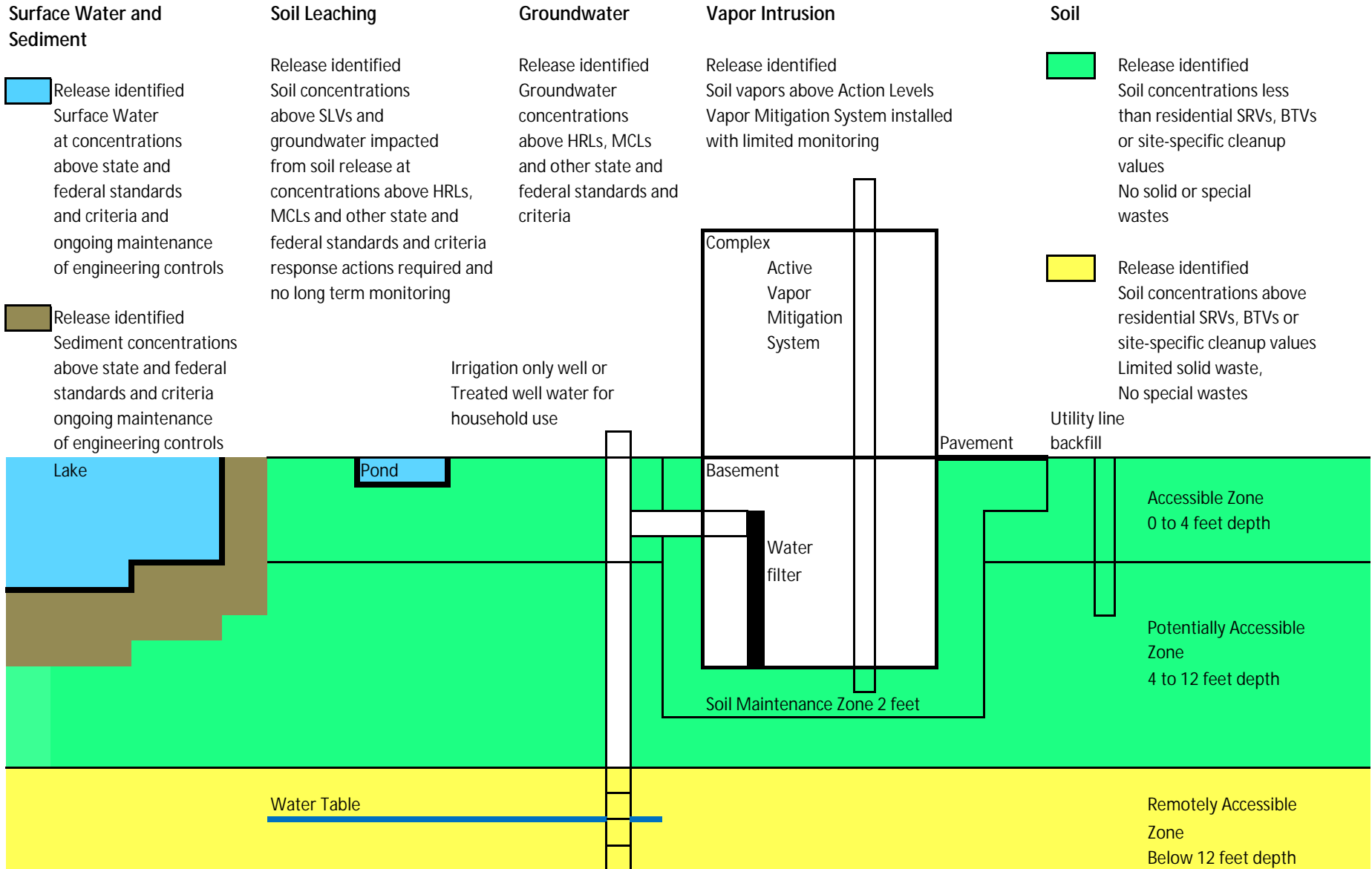


Figure B-4 Minimum Requirements for Environmental Covenant Residential/Recreational - Multi- Family and Other Uses Residential/Recreational - Recreational

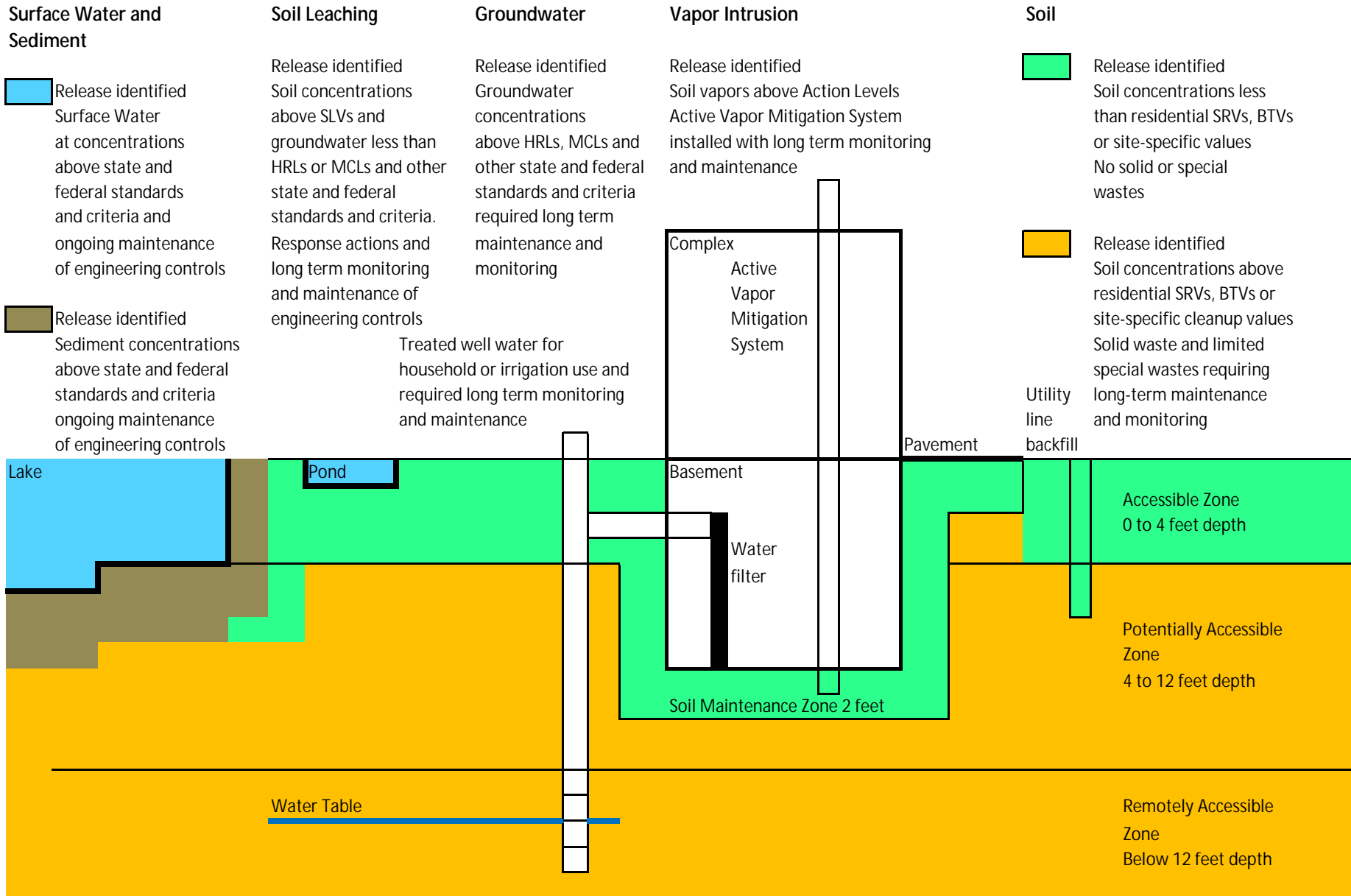




Figure C-1 Minimum Requirements for No Institutional Control or Notification Industrial/Commercial

Surface Water and Sediment

 Surface Water at natural background concentrations

 Sediment at natural background concentrations

Soil Leaching

Soil at natural background concentrations


Groundwater

Groundwater at natural background concentrations

Vapor Intrusion

Soil vapor at natural background concentrations

Soil

 Soil at natural background concentrations no solid or special wastes

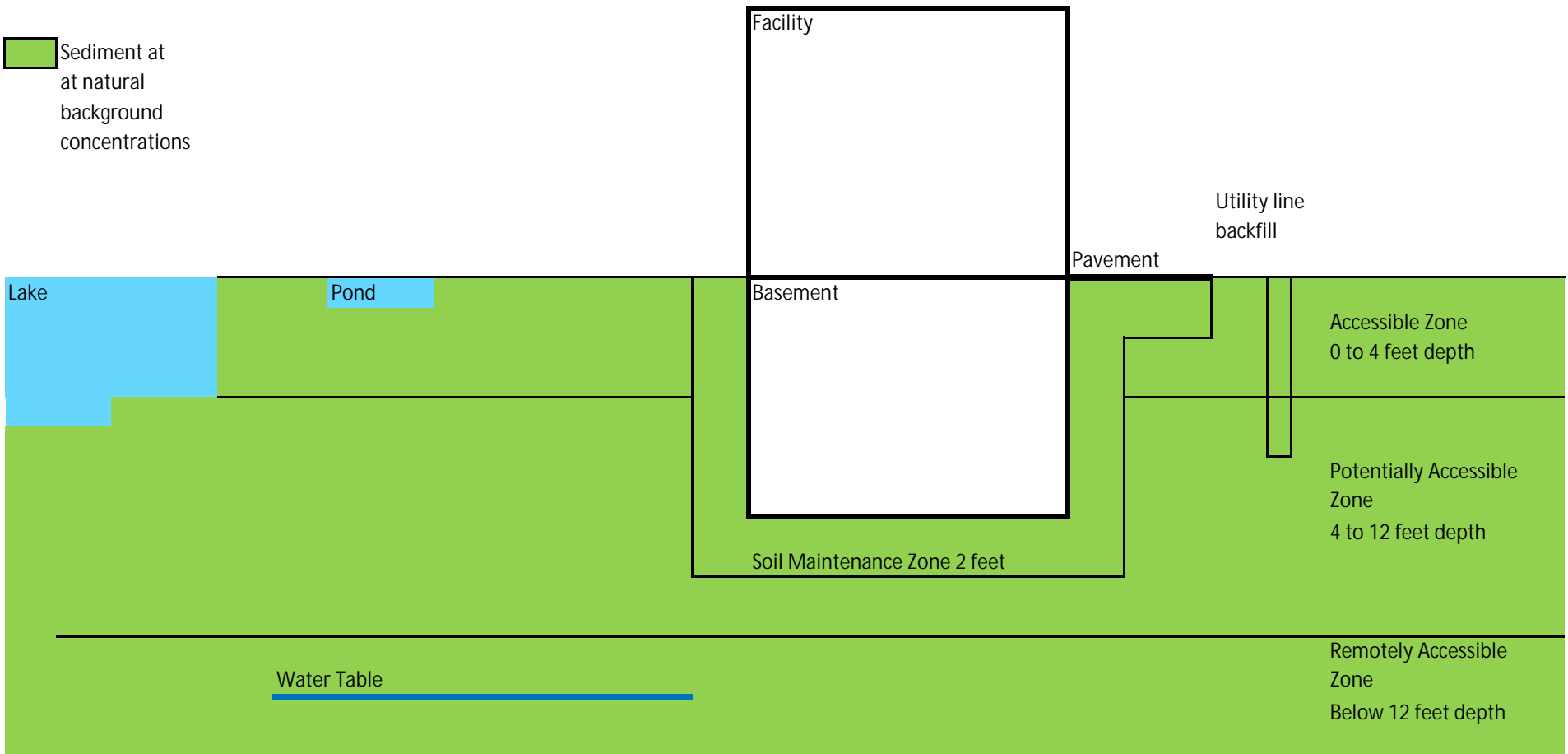


Figure C-2 Minimum Requirements for Assurance Letter Notification Industrial/Commercial

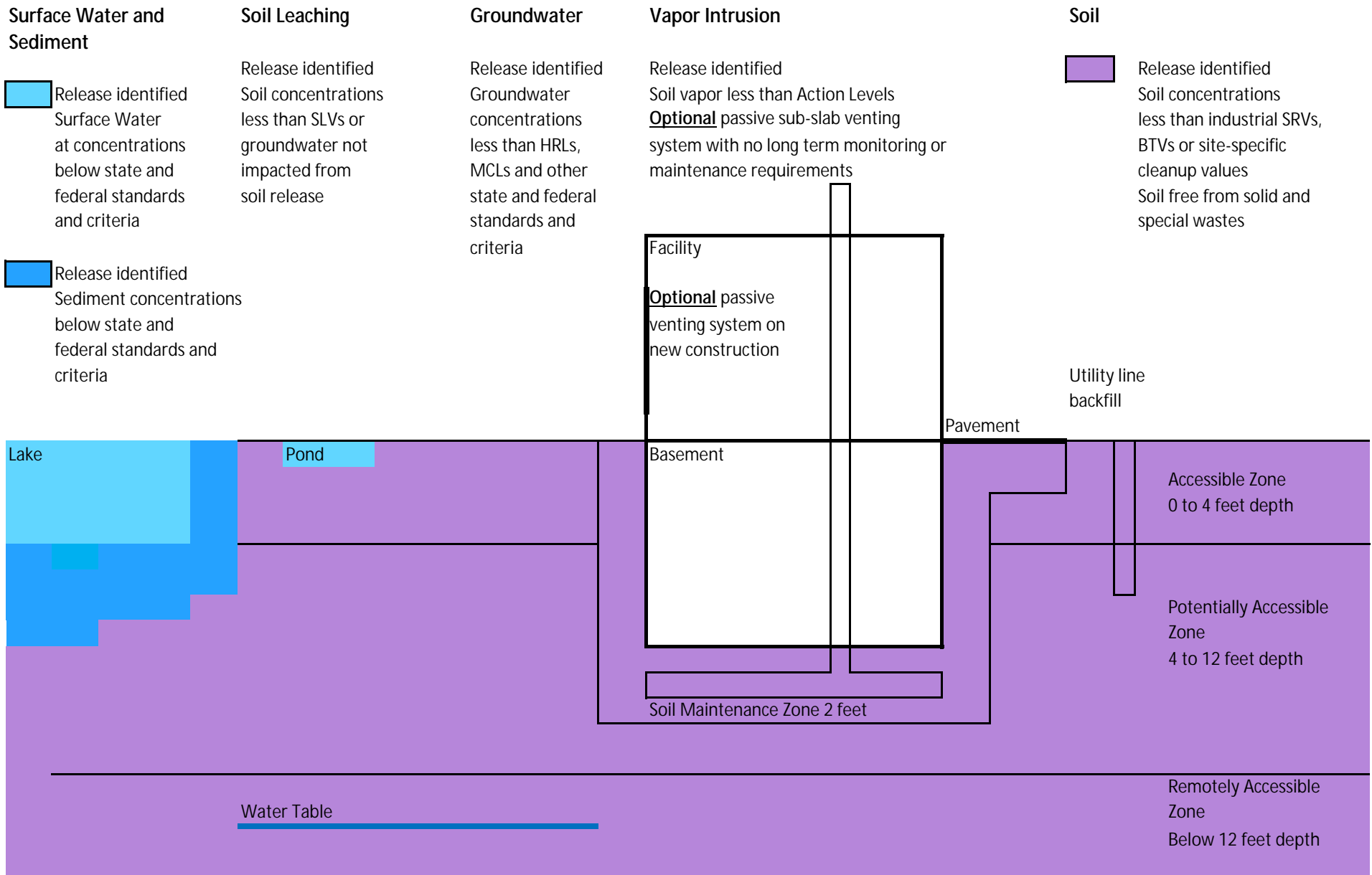


Figure C-3 Minimum Requirements for Real Property Affidavit Industrial Commercial

Surface Water and Sediment

Release identified Surface Water at concentrations above state and federal standards and criteria and with limited monitoring of engineering controls

Release identified Sediment concentrations above state and federal standards and criteria with limited monitoring of engineering controls

Soil Leaching

Release identified Soil concentrations above SLVs and groundwater impacted from soil release response actions required and no long term monitoring and maintenance

Irrigation or water level control only or Treated well water for facility use

Groundwater

Release identified Groundwater concentrations above HRLs, MCLs and other state and federal standards and criteria

Vapor Intrusion

Release identified Soil vapors above Action Levels Active Vapor Mitigation System installed with limited monitoring

Soil

Release identified Soil concentrations less than industrial SRVs, BTVs or site-specific cleanup values No solid or special wastes

Release identified Soil concentrations above industrial SRVs, BTVs or site-specific cleanup values Limited solid waste, No special wastes

Utility line backfill

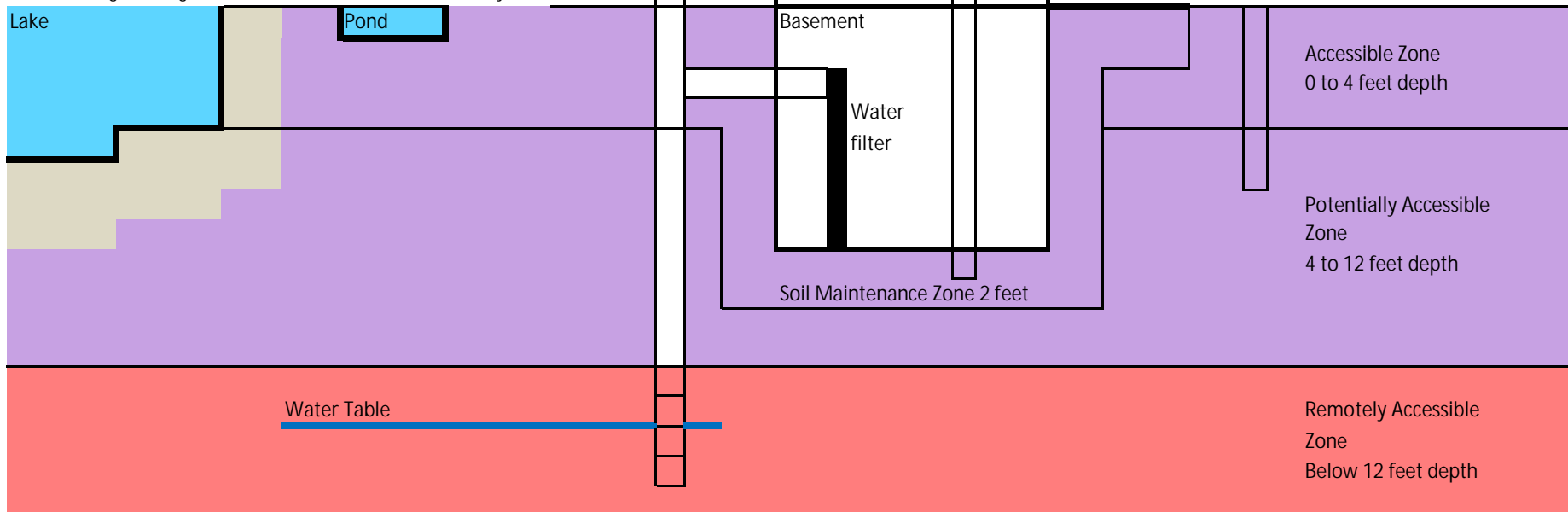


Figure C-4 Minimum Requirements for Environmental Covenant Industrial/Commercial

