NJDEP Technical Guidance Document Review Form

Document: ***DRAFT Alternative Remediation Standards Technical Guidance for the Migration to Ground Water Pathway Version 1.0***

Comment Period: ***November 16, 2020 to December 28, 2020***

Committee Chairperson: Swati Toppin

Comment #	Page	Section	Subsection	COMMENTS	RESPONSE
1		General		The Migration to Groundwater Pathway Technical Guidance (MGWTG) is being issued to support the proposed Draft Remediation Standards (Docket 01-20-03) which proposes the establishment of Migration to Groundwater soil standards and Soil Leachate Remediation Standards for the Migration to Ground Water for the first time. The implementation of the new remediation standards will increase the complexity associated with all soil and groundwater projects. CCNJ/SRIN appreciate the opportunity to review the MGWTG, however, we are disappointed the DEP has failed to address several detailed technical issues. Instead, the MGWTG references a future Basis and Background document that remains "under development", but is directly referenced 8 times in this guidance document. The parameters and interpretation that will be presented in the future Basis and Background document have the potential to limit the use of site-specific information as well as the professional judgement of the LSRPs involved with the cases. The DEP should delay finalization of the new remediation standards until the Basis and Background document is published and reviewed in draft format. CCNJ/SRIN believe these new remediation standards will have a great impact on the remediation of contaminated sites including considerable implementation and financial impacts. Additional comment periods and consideration of all opinions will benefit the public, the DEP staff and the regulated community, and complies with the APA. **(CCNJ)**	The Department disagrees that the finalization of the Remediation Standards should be delayed until the Basis and Background document is published and reviewed in Draft format. The Basis and Background document has been released, documenting the basis of the Migration to Ground Water Soil Remediation standards, including the basis of default parameter values. The Basis and Background document is primarily concerned with the default standards, not the alternative remediation standards, and does not limit the use of parameters beyond what is discussed in this document. Most of this information has been available for many years in the previous Impact to Ground Water guidance documents and in the previous Inhalation Remediation Standards Basis and Background Document. The basis for the derivation of the existing impact to ground water soil screening levels and soil leachate criteria which are now codified were previously available in the following documents https://www.nj.gov/dep/srp/guidance/rs/partition_equation.pdf and https://www.nj.gov/dep/srp/guidance/rs/splp_guidance.pdf These documents were in use for years. Further, all the equations and parameter values needed to calculate both the Migration to Ground Water Soil Remediation Standards and the Soil Leachate Remediation Standards have been provided in the rule. The impact to ground water exposure pathway, now designated the migration to ground water pathway, has been addressed for years, and procedures for determination of the new alternative remediation standards remain similar to those that have been in place for many years, with other options being added more recently. Therefore, there will be no additional complexity when remediating contaminated sites, including financial or implementation impacts.
~~2~~		General		The guidance document references a future Basis and Background document numerous times but it is noted as being "under development". The information / details that will likely be included in the Basis and Background document have the potential to better inform the user regarding certain assumptions. This information could also be important to better understand this guidance document, as well as support the use of professional judgement by LSRPs in certain circumstances. Accordingly, the Basis and Background document should be provided to the stakeholders prior to finalization of this guidance document. **(LSRPA)**	Most of the information in the new Basis and Background document has been available for many years in the previous Impact to Ground Water guidance documents and in the previous Inhalation Remediation Standards Basis and Background Document. The new document is an update of the older documents. The basis for the derivation of the existing impact to ground water soil screening levels and soil leachate criteria which are now codified were previously found in the following documents https://www.nj.gov/dep/srp/guidance/rs/partition_equation.pdf and https://www.nj.gov/dep/srp/guidance/rs/splp_guidance.pdf .These documents have been in use for years. Further, all the equations and parameter values needed to calculate both the Migration to Ground Water Soil Remediation Standards and the Soil Leachate Remediation Standards have been provided in the rule. The MGW basis and background document is available at https://www.nj.gov/dep/srp/guidance/rs/.
3		General		In 2010 and 2011, the DEP sought the review and comment of the DEP Science Advisory Board (the SAB) regarding the Impact to Ground Water Soil Remediation Standards guidance documents. The SAB included independent technical reviewers who prepared a draft report which was reviewed by representatives of the Site Remediation Program. At least two meetings were held between the SAB reviewers and representatives of the DEP, and the DEP was allowed to provide comments to the draft SAB report. A final SAB report was issued on October 20, 2011. On December 13, 2011, the DEP issued a Response to the SAB comments in a brief, bulleted 4-page memo. Since December 2011, the DEP's position is that the DEP memo addressed the majority of the SAB comments. By reference and request, CCNJ/SRIN reference the SAB report because the vast majority of the SAB's recommendations have not been addressed by the DEP nor included within this MGWTG document. At a minimum, the SAB reviewers noted a Basis and Background document was not available for the impact to groundwater pathway, and this document is required to provide a complete review of the DEP's proposed guidance document (pages 2, 6, 7, 8 and 11). We would like to reiterate that CCNJ/SRIN submitted the SAB report as part of the SRS comments dated August 4, 2020 as Attachment A, and attach it again with this submittal, along with DEP's memo response. We continue our position that the technical information including the Basis and Background and this MGWARS guidance must clearly address all recommendations and Industry's concerns in a detailed and concise manner. For more than 9 years the DEP has not completed the referenced Basis and Background document for the Impact to Groundwater or Migration to Groundwater pathway. The DEP should delay finalization of the new remediation standards until the Basis and Background document is published and reviewed in draft format. CCNJ/SRIN believe these new remediation standards will have a great impact on the remediation of contaminated sites including considerable implementation and financial impacts. Additional comment periods and consideration of all opinions will benefit the public, the DEP staff and the regulated community, and complies with the APA. **(CCNJ)**	The commenter states that "...these new remediation standards will have a great impact on the remediation of contaminated sites..."., but the procedures described in this guidance document are largely updated versions of procedures that have been in place for many years and have been used since 2008. There will be no major changes in the remediation of contaminated sites. The basis and background information for the Migration to Ground Water Pathway has always been available. While a new Migration to Ground Water Basis and Background document has now been released, the information in this document is largely an update of information that has been available since 2008 that was included in the various guidance documents that were posted on the internet for the Impact to Ground Water pathway, and in the Inhalation basis and background document. Since Migration to Ground Water Standards are now being promulgated, this information is now being consolidated into a single basis and background document. Regarding the commenter statements pertaining to the Science Advisory Board, the SAB comments pertain to 2008 versions of the Impact to Ground Water guidance documents, which are from thirteen years ago. The Department responded to the Science Advisory Board at that time, both in writing and in a meeting. Two updates to the guidance documents have been made since the 2011 New Jersey Department of Environmental Protection Science Advisory Board review, and several of the board's recommendations have been incorporated into current guidance. The Department disagreed with other comments made by the board, and some recommendations made by the board were in conflict with department policies or regulatory requirements.
4		General		Through direct and indirect references, the MGWTG identifies that the migration to groundwater soil remediation standards (MGWSRS) are based upon the worst case condition where chemicals within the unsaturated zone will adversely affect groundwater quality in an unspecified time period less than 100-years. Section 2.3 includes the statement "Migration to Ground Water standards are designed to prevent future contamination of the ground water from current soil contamination or residual contamination remaining after remediation." The MGWTG does not identify when this potential "future condition" will occur or a method to determine when the worst case condition has occurred. The MGWSRS fails to recognize that all chemicals are affected by their release to the environment through volatilization, dispersion, adsorption, degradation, absorption, solidification, ionic bonding or other attenuation actions. Additionally, the MGWTG fails to identify or describe acceptable methods to determine the date that chemicals of concern have generated the maximum potential impact on groundwater quality. The MGWTG should define the procedure for an LSRP to project the date that future groundwater quality will not be negatively affected by chemicals within the unsaturated zone. The default DEP evaluation is to continue a point by point comparison of all sample results throughout the RA and RAO phases. The MGWTG should define DEP's policies and guidance on attainment alternatives that are not based solely on point by point compliance, which is necessary for the Investigators and the regulators. **(CCNJ)**	The default migration to ground water remediation standards are meant to be adequately protective of anticipated/typical scenarios when only the concentration of a contaminant is known. This is true of all default remediation standards for all exposure pathways. When additional site-specific information is available, the various Alternative Remediation Standards (ARS) options described in this guidance may be used. It is not necessary to determine the date that future ground water quality will be negatively affected by chemicals within the unsaturated zone, as long as it is indicated that current site conditions indicate the potential for future ground water contamination. However, the SESOIL and SESOIL/AT123D modeling options can make this determination, and estimate the date of maximum impact. Furthermore, when it can be demonstrated that no ground water impact is expected within 100 years, the migration to ground water pathway is not of concern. The Site Soil and Ground Water Data option assumes that the time of the highest of maximum ground water contamination is the present time, since the worst contamination is present at the water table. The Immobile Chemical Option includes a list of chemicals and a scenario that has already been evaluated for a 100-year time frame to determine that future ground water contamination is unlikely. Some other options only indicate that there is a potential for future contamination of ground water, but do not predict a particular time. Unless it has been demonstrated that the ground water will not be impacted for at least 100 years, the current site conditions are of concern and additional action is necessary. Depending on the ARS option selected, an assessment of factors such as those cited by the commenter (for example, adsorption, attenuation, etc.) is included. A "point-by-point comparison of all sample results through the RA and RAO phases" is required when it is necessary to compare sample results with a default or site-specific standard, as is required for any exposure pathway. A discussion of attainment and compliance policies is beyond the scope of this document.

5	General	Many medium to large sites typically have 10 or more AOCs, and its not uncommon for the number AOCs to exceed 50 or 100 at larger sites. Additionally, these larger sites could conceivably have numerous AOCs for the same constituents where site-wide subsurface conditions are consistent. Accordingly, LSRPA recommends that a statement be included in this guidance document that allows for the option to evaluate AOCs in groups/across larger areas of the site or allow for a site-wide migration to groundwater ARS, if applicable. **(LSRPA)**	Agreed. If soil and contaminant conditions are similar throughout a site and/or across multiple AOCs, multiple AOCs have often been combined into a site-wide AOC. This has been done in the past and may continue to be done in the future. While the text regularly uses the term "AOC- or site-specific-" in the various options presented in this document, this issue is not specifically discussed in the guidance. A statement has now been added to Section 3 of the guidance allowing this practice. However, for larger combined AOCs, the number of samples required to assess site-specific soil properties and to conduct procedures such as SPLP testing should be increased from the minimum of 3 samples in accordance with the Technical Requirements and other guidance. Where the LSRP uses professional judgment in this respect, they should provide adequate documentation of such in appropriate Remedial Phase Reports and in the ARS submissions.
6	General	Throughout the guidance document and the proposed amendments, the DEP references the potential for future groundwater conditions that could develop based on migration of chemicals to the groundwater. One example is the statement in Appendix E, "all Migration to Ground Water Soil Remediation Standards (MGWSRS) are developed to protect the ground water from future exceedances of Ground Water Remediation Standards (GWRS) that may result from leaching of contaminants from the unsaturated soil zone to the underlying ground water." The majority of remediation sites have been under investigation for several years, and the initial release of chemicals to the unsaturated zone may have occurred years before investigations began. CCNJ/SRIN understand the derivation of the remediation standards and any alternative standards should be protective of future conditions, however, the guidance should include a discussion of reasonable timeframes to determine when the chemicals in soil and groundwater are near equilibrium. This discussion could be provided by chemical characteristics, types of chemicals, or techniques that could be utilized by the LSRPs. Remaining silent on reasonable timeframes as currently proposed in the MGWTG is unacceptable. **(CCNJ)**	While the Department considered developing an approach to specifically address so-called "legacy sites", a consensus has not yet emerged from either internal or external discussions. It is difficult to develop a generic approach for these sites due to a wide range of site-specific considerations, such as the site history, the nature of the contaminant, depth to ground water, extent of impervious cover, soil type, organic carbon content, etc. However, the Department may be consulted on a site-specific basis. Some contaminants take a long time to migrate to the ground water, depending on site conditions and contaminant properties. Some contaminants may remain mobile for many years or indefinitely. Therefore, determining a length of time after a discharge after which it can be assumed there are no remaining potential impacts of vadose zone contamination to ground water is a contaminant and site-specific decision. The Department's alternative remediation standard options do provide tools for assessing old discharges. These options consider the nature of the contaminant, its location in the soil, site conditions, and its potential to migrate over a long period of time. First, for contaminants that have not reached the ground water, the SESOIL model may be used to demonstrate that existing contamination in the soil will not reach the ground water in the next 100 years. When the SESOIL model shows ground water will not be impacted, the existing contaminant concentrations in soil may be used as the alternative remediation standard. Second, the immobile chemical option considers the migration to ground water exposure pathway to be adequately addressed for low mobility contaminants when an adequate separation distance exists between the contamination and the water table. Third, the migration to ground water exposure pathway is considered to be adequately addressed when the highest contaminant concentrations are present at or have reached the water table and ground water contamination has not occurred. For contaminants that no longer pose a threat to ground water because they are considered to be essentially irreversibly adsorbed to soil, the SPLP test should indicate this condition and should provide an adequate alternative remediation standard. Chemicals in a soil and ground water system do not approach "equilibrium", because environmental systems are generally open and dynamic. Equilibrium can only be observed for non-degrading contaminants in closed systems. When chemicals exhibit unchanging concentrations in environmental systems, it is a steady state situation, in which contaminant inputs and outputs to the various compartments in the system are balanced. This is not the same as equilibrium.
7	General	Throughout the guidance document, the NJDEP references the potential for future groundwater conditions that could occur as a result of the migration of chemicals to groundwater. The majority of SRP sites with known or suspected groundwater impacts typically have been under investigation for many years (or decades in some instances), with the initial release of chemicals to the unsaturated zone occurring years before investigations began (aka "Legacy Sites"). The guidance should include a discussion regarding the use of reasonable timeframes to determine when the chemicals in soil and groundwater are at or near equilibrium, such that groundwater monitoring data and other site-specific lines of evidence could be used to document the lack of any realistic potential that the groundwater would be adversely impacted in the future. The NJDEP previously published a guidance document titled "Soil and GW Analytical Data Evaluation" which attempted to partially address this issue. LSRPA recommends that NJDEP meet with Stakeholders to develop language for inclusion in this guidance document regarding a compliance policy statement for Legacy Sites with extensive data sets/lines of evidence that could be used to support the lack of future potential groundwater impacts. **(LSRPA)**	Chemicals in a soil and ground water system do not approach "equilibrium", because environmental systems are generally open and dynamic. Equilibrium can only be observed for non-degrading contaminants in closed systems. When chemicals exhibit unchanging concentrations in environmental systems, it is a steady state situation, in which contaminant inputs and outputs to the various compartments in the system are balanced. This is not the same as equilibrium.
8	General	Appendix 8 (Development of Alternative Remediation Standards for Soil for the Migration to Ground Water Pathway), II(c) of the proposed Remediation Standards Rule states that: *"With prior approval by the Department, an ARS may also be developed using scientific methods other than those described in III(a) through (g) below including relevant guidance from the USEPA, other states, and other relevant, applicable, and appropriate methods and practices that ensure the protection of public health and safety and of the environment."* The LSRPA requests that this language also be included and reflected in this Guidance document. **(LSRPA)**	Agreed. This statement has been added to the guidance in Section 2.0.
9	General	The DEP fails to recognize how often the MGWTG will be utilized by the regulated community to address the new migration pathway, as demonstrated by the lack of details associated with sites with multiple years of investigation data. The leaching to GW pathway should only be assessed at sites with new releases and soil-only impacts where usable GW is not being monitored or remediated. Otherwise, the guidance has the potential to drive unnecessary leaching to GW assessments at numerous sites where such assessments are unnecessary or the worst-case scenario has passed. These would be sites where: a) the release history is well documented; b) travel times to groundwater are relatively short, ranging from hours to only a few months; c) COPC trends in groundwater are well documented because of on-going monitoring/remediation; and d) groundwater is unusable based on low yield/poor background water quality which is often encountered in urban and rural locations with non-point source contamination. **(CCNJ)**	The migration to ground water exposure pathway is not new. Since 2008, it has been required to be addressed at all sites; it was called the impact to ground water pathway. This comment discusses when the migration to ground water pathway should be assessed and therefore is beyond the scope of this guidance document, however the commenter is referred to the Brownfield Act. This document is concerned with procedures for development of site-specific alternative remediation standards for the migration to ground water exposure pathway. In multiple sections (for example, 2.4, 4.1, 6.2.1.2) the guidance states that for Class I or Class III ground water, approval of a site-specific Ground Water Remediation Standard (GWRS) can be obtained from the DEP, and that this GWRS may then be used instead of the Class IIA standard to develop a site-specific Migration to Ground Water Alternative Remediation Standard.
10	General	The MGWTG should include a discussion of alternative techniques to evaluate site-specific remediation standards which may be utilized by an LSRP for an active remediation site forced to comply with the new MGWSRS and MGW Leachate SRS. One example is the use of soil vapor sampling as a tool to characterize chemicals in the unsaturated zone. This technique is presented in the *Capping of Volatile Contaminants for the Impact to Ground Water Pathway* guidance document, dated January 2019; however, this is not referenced or discussed in this document. In the "Capping Guidance", soil vapor sample data may be used as a line-of-evidence to assert the chemicals in soil do not pose a threat to groundwater quality. Another example is the spatial and statistical presentation of historical groundwater quality. A similar request was identified in the SAB review in October 2011 and not addressed by the DEP in the December 2011 response memo. It is very disappointing that the DEP has not addressed this issue in the draft ARS MGW technical guidance document for the regulated community. CCNJ/SRIN recommend that the DEP conduct the evaluation and provide the clarification to the regulated community. CCNJ/SRIN also recommend additional soil quality evaluation techniques be incorporated into the MGWTG to develop MGWARS and to more accurately characterize site conditions and address the SAB October 2011 recommendation. **(CCNJ)**	Compliance documents such as the capping technical guidance may be used as a means to address the MGW pathway, but do not pertain to the determination of alternative remediation standards and are therefore beyond the scope of this guidance document. The statement taken from the capping document regarding the use soil vapor data is taken out of context, and only relates to sites with residual remaining volatile contaminations, a low permeability cap, and no recharge to ground water. With respect to the comment stating "spatial and statistical presentation of historical ground water quality", is unclear as to how it relates to the Science Advisory Board review. The SAB report does not include specific suggestions on this topic in Section 4.3.4 or elsewhere. The Migration to Ground Water pathway is concerned with potential future ground water contamination from contaminants still present in the vadose zone at the time of site assessment. Historical ground water data is used in the SESOIL/AT123D option, the Site Soil and Ground Water Data Evaluation option (which correlates soil and ground water data), and in some of the compliance options for the migration to ground water exposure pathway. The SPLP test also correlates soil and soil leachate concentrations, the latter of which correlates with potential impacts to ground water. Regarding the commenter statements pertaining to the Science Advisory Board and the Department's response, the SAB comments pertain to 2008 versions of the Impact to Ground Water guidance documents, which are from thirteen years ago. The Department responded to the Science Advisory Board at that time, both in writing and in a meeting. Two updates to the guidance documents have been made since the 2011 New Jersey Department of Environmental Protection Science Advisory Board review, and several of the board's recommendations have been incorporated into current guidance. The Department disagreed with other comments made by the board, and some recommendations made by the board were in conflict with Department policies or regulatory requirements. It is not clear what the commenter means by "soil quality evaluation techniques". However, the guidance allows for site-specific modification of the most important soil parameters and those most practical to measure. If an investigator feels it is worthwhile to investigate other soil properties, the Department may be consulted.

11	General	The MGWTG does not provide any cross references with other DEP guidance which creates a conflict in interpretations, creates project delays and increases project costs. As an example, in the "Capping Guidance", the DEP states "In the absence of LNAPL, a vertical separation distance of greater than five feet between the water table and the depth of the IGWSSL/IGWSRS exceedance is adequate to address the impact to ground water pathway." This MGWTG mandates the use of the Seasonal Soil Compartment Model (SESOIL) program which must be reviewed and approved by the DEP rather than establishing reasonable vertical separation distances. Therefore, CCNJ/SRIN recommend that DEP establish reasonable vertical separation distances as well as a cross reference to other guidance documents and include within a comprehensive public review process.**(CCNJ)**	The commenters are referencing discussion from another guidance document that has no bearing on this document. The statement quoted by the commenter regarding a vertical separation distance of greater than five feet has been taken out of context. This statement only applies to vapor-only transport of volatile petroleum hydrocarbons (which are degradable), when a site has a low-permeability cap, and no infiltration of rainfall to the groundwater occurs. The capping guidance is a compliance document discussing a specific scenario to address the migration to ground water exposure pathway. Discussion of that document is beyond the scope of this guidance, as it does not involve calculation of an ARS. This guidance does not mandate the use of the SESOIL program. The SESOIL model is one of the options that the investigator may employ to develop alternative remediation standards. With the exception of the immobile chemical option discussed below, it is not practical to specify a single separation distance (between the contaminated soil zone and the ground water) for a contaminant or class of contaminants. When contaminant transport through the unsaturated zone occurs via infiltration of rainwater and ground water recharge, the determination of an acceptable separation distance is complex and will depend not only on the adsorption potential of the contaminant to soil, but also the soil texture, depth to ground water, the location of the contaminant relative to the soil surface and the ground water, and climate data, the latter of which does vary to some extent across New Jersey. An illustration of these issues is described in the immobile chemical section of the migration to ground water basis and background document. It is generally unappreciated that the depth to ground water and the location of the contaminant relative to the soil surface have a significant effect on the distance of contaminant transport. The SESOIL model is easy to quickly run with default soil conditions and a site-specific depth to ground water in order to determine an adequate separation distance for a particular site. For highly adsorbed compounds, the recommendation of a separation distance is less difficult, since they migrate very slowly under all conditions. For these compounds, it was possible to recommend a two-foot separation distance. This is explained in the immobile chemical section of this document and the Migration to Ground Water Basis and Background document.
12	General	The MGWTG should include cross references to other current DEP guidance documents. The "Capping Guidance" speaks of demonstration of reduced contamination in the vadose zone: "When capping is selected as a remedy to address IGW, Monitored Natural Attenuation (MNA) can be used to demonstrate that, while contamination to the ground water from the vadose zone may still be occurring, the contribution from the vadose zone is decreasing and is predicted to cease by the end of the Classification Exception Area (CEA) timeframe that is established for the contaminated ground water." CCNJ/SRIN recommend cross referencing the previous guidance with updated and comprehensive capping guidance in order to streamline the introduction of these new remediation pathways and increase the effectiveness of the DEP, increase the effectiveness of the LSRPs and decrease time to RAOs. **(CCNJ)**	This document addresses calculation of ARS options for the migration to ground water exposure pathway. Capping represents a compliance option (distinct from an ARS) and is beyond the scope of this document. Compliance options are discussed in other guidance documents (e.g., Attainment/Compliance). There are several other guidances, compliance or otherwise, that may apply to any given site, in various combinations. It is beyond the scope of this document to discuss every possible Site Remediation Program guidance that may apply to every conceivable site simply because ARS options are used to derive a site-specific standard (for example, compliance averaging may be used in combination with a calculated, site-specific ARS). The LSRP is expected to use professional judgment in determining which guidances best serve the site in question, such that human and environmental health and safety are balanced with optimum use of financial resources and within the site-specific time constraints.
13	General	The MGWTG does not include any discussion of any unsaturated media except soil. The MGWTG should identify actions and evaluation of historic fill, dredge sediments or other non-native soils. The SAB report dated October 2011 contained a similar recommendation, which was ignored in the DEP's response memo of December 2011. In the context of alternative fill such as dredged sediments or other non-native soils, the regulated community currently has to meet IGW screening levels; however, once this rule is adopted, they will have to meet MGW standards. For example, if numbers are above these MGW standards (e.g. 2-methylnaphthalene: IGW = 8 mg/kg, MGW = 3.1 mg/kg), you would not be able to use dredged sediments or other non-native soils as alternative fill even if placed under a structure or cap; in addition, LSRPs would not be able to use a variance. Further, that means this alternative fill is now a "source" above MGW standards that has the potential to impact future groundwater remediation standards. It is very disappointing that the DEP in the draft ARS MGW technical guidance document has not provided the regulated community additional clarification on how to address historic fill, dredge sediments, or other non-native soils. CCNJ/SRIN recommend that the DEP conduct the evaluation and provide the clarification to the regulated community. **(CCNJ)**	This guidance document addresses the development of alternative remediation standards for the migration to ground water exposure pathway for soil. The migration to ground water exposure pathway, as stated in N.J.A.C. 7:26D-4.4, deals with soils in the vadose zone. Addressing alternative fill or historic fill is the purview of other guidance documents and is beyond the scope of this document. There are several other guidance documents besides these that may apply to any given site, in various combinations. It is beyond the scope of this document to discuss every possible Site Remediation Program guidance that may apply to every conceivable site simply because ARS options are employed to develop a site-specific standard. The LSRP is expected to use professional judgment in determining which guidances best serve the site in question, such that human and environmental health and safety are balanced with optimum use of financial resources and within the site-specific time constraints. There is no change from previous procedures for the impact to ground water pathway pertaining to fill and other material. Note that with regard to the comment that the guidance document should address historic fill and dredge spoils, the LSRP should use professional judgment on whether the historic fill and/or dredge spoil material may be considered soil-like material. For example, historic fill may consist primarily of silt and sand and dredge soils often consist of silt and clay, and/or other soil-like material. In such cases various options to develop alternative MGWSRS may be appropriate. However, where historic fill may consist of primarily of material such as concrete fragments, brick fragments, cinders, etc., certain options to develop alternative MGWSRSs (e.g., SESOIL), may not be appropriate.
14	General	The DEP must provide guidance and policy (i.e. Migration to Ground Water Basis and Background document) on how these standards will affect ongoing and historical investigations. **(CCNJ)**	The several questions listed in Comment 14 are shown as 14a through 14f, and respoded to accordingly.
14a	General	If chemicals in groundwater exceed the GWQS, will the DEP mandate sampling for the soil leachate remediation standard? Will supplemental soil sampling for the soil leachate remediation standard be mandated based on a statistical measure of groundwater quality? Will soil leachate samples be required at all sites? At older sites only? At no current sites? **(CCNJ)**	The Department does not require soil sampling in order to measure soil leachate concentrations to compare to the soil leachate standards. Such soil sampling is not triggered based on ground water quality data. The migration to ground water pathway is used to protect against potential future contamination of ground water from a soil contamination source, and it does not necessarily relate to the current state of ground water contamination. Sampling to measure soil leachate concentrations is conducted at the discretion of the licensed site remediation professional, when the licensed site remediation professional decides to use the Synthetic Precipitation Leaching Procedure (SPLP) test. Soil leachate standards are used in conjunction with the Synthetic Precipitation Leaching Procedure option only.
14b	General	What actions will be required if the soil leachate concentrations are below the remediation standards, but groundwater quality remains above standards? **(CCNJ)**	There is no direct connection between these two parameters, as far as action that would be taken by the Department. The migration to ground water exposure pathway deals with soil that could potentially be a future source of ground water contamination. Soil leachate concentrations are used only to develop Migration to Ground Water Alternative Remediation standards using the Synthetic Precipitation Leaching Procedure (SPLP). Remediation of ground water is a separate issue.
14c	General	What actions will be required to close a groundwater remediation project? **(CCNJ)**	This question deals with closure of a ground water remediation project, and, as such, is beyond the scope of this guidance.
14c	General	Will soil MGW samples be required? Based on what criteria and where? Under what conditions will MGW soil samples or soil leachate soil samples be unnecessary? Above a saturation point? Within the capillary fringe? Below a confirmed water table? Under no conditions, etc.? **(CCNJ)**	The Department's procedures and requirements regarding sampling remain unchanged upon adoption of the rule. The rationale for soil sampling for the migration to ground water exposure pathway is no different than for any other pathway, and is based on the Technical Requirements for Site Remediation, N.J.A.C. 7:26E, including the possibility of a known or suspected discharge of contaminant. Once samples are obtained, all samples in the vadose zone only must be evaluated to determine whether the contaminant concentrations exceed migration to ground water soil remediation standards. Migration to ground water samples are not obtained below the water table or above the saturation point because the pathway only applies to the vadose zone. See 52 N.J.R. 570. The capillary fringe is normally considered part of the vadose zone and may be subject to sampling if that is where the contamination is located. Soil leachate samples are not collected in the field; they are generated when testing soil samples via the Synthetic Precipitation Leaching Procedure, and this procedure is optional. This document along with the Remediation Standards, N.J.A.C. 7:26D, provide further details on procedures that need to be followed.
14d	General	Will the DEP RAP reviewers mandate the location of soil samples for groundwater permits, similar to RAP reviewers' recent mandates for vertical and horizontal groundwater delineation locations? **(CCNJ)**	This guidance addresses alternative remediation standards for the migration to ground water exposure pathway. It is not a review on remedial action permits. As such, this comment is beyond the scope of this guidance. The location and quantity of samples collected as part of a rememdial investion to address the MGW pathway is based on the professional judgment of a licensed site remediation professional. The documentation to support such judgment represents the basis to accept or dispute requests from Department RAP staff for additional sampling.

14e	General			What latitude will be provided to the LSRP for professional judgement? **(CCNJ)**	This question is outside the scope of this guidance, except for its relation to the development of alternative remediation standards. For the development of alternative remediation standards, there is no change in licensed site remediation professional judgement allowance, and the ability of an LSRP to use professional judgment remains unchanged from previous years. The licensed site remediation professional has the latitude to use professional judgment to evaluate if using an alternative remediation standard in lieu of a default remediation standard is appropriate for use at a site. The Department should be consulted for approval prior to using procedures other than those described in this guidance. As with compliance with regulations other guidance documents, the LSRP should provide adequate documentation of work conducted and identify any variances with regulations and deviations to guidance in remedial phase documents.
14f	General			The current DEP guidance document demands the maximum soil concentration undergo SPLP testing or be remediated. In other words, the maximum soil sample must be submitted for SPLP sampling and no linear projection of SPLP results are allowed. Will the DEP maintain this policy for the soil leachate remediation standard? **(CCNJ)**	The Department does not require the maximum contaminant concentrations in soil be tested via Synthetic Precipitation Leaching Procedure (SPLP) in all cases. However, since a migration to ground water alternative remediation standard developed using the SPLP procedure cannot be higher than the maximum contaminant concentration in soil that is tested, the Department recommends including the highest concentration sample if using the SPLP option to develop a site-specific migration to ground water alternative remediation standard, in order to potentially avoid remediation of soil at that concentration. Extrapolation of SPLP results to concentrations higher than those tested is not allowed because the capacity of a soil to adsorb contaminant may be exceeded at concentrations higher than those tested via SPLP. Soil leachate samples are generated in the SPLP test using the selected soil samples that the licensed site remediation professional decides to submit to the procedure.
15	General			The DEP has identified eight contaminants with proposed site remediation standards more stringent than the USEPA RSLs based on soil water partitioning. The DEP compared the proposed soil migration to groundwater standards, which are based on a Dilution Attenuation Factor (DAF) of 20, to the USEPA RSL values, which are based on a DAF of one. The CCNJ/SRIN analysis found the proposed remediation standards for ten contaminants to be more stringent than the RSL values when using the NJDEP DAF 20 values compared to the USEPA DAF 1 values. The DEP included dibromochloromethane as one of the eight they discussed as more stringent, but it should not have been included because the standard is actually the practical quantitation limit (PQL), which is greater than the RSL value. The three contaminants the DEP did not include as being more stringent are 1,1 dichloroethene, mercury, and 1,1,1 trichloroethane. A comparison of the proposed soil migration to groundwater standards to the RSL applying the same DAF of 20 indicates that 46 of the 106 proposed standards are more stringent than the USEPA RSL values. **(CCNJ)**	This comment pertains to the Remediation Standards rule and as such is beyond the scope of this document..
16	General			CCNJ/SRIN anticipate the DEP's decision to codify the migration to ground water exposure pathway will mandate ARS values at dozens of sites. Based on the SAB report dated October 20 2011, it stated "Application of the MGWSRS for all but very simple cases necessitates development of different MGWARS for each Area of Concern (AOC) within a site. Many medium to large sites typically have 15 or more AOCs, although it is not uncommon for AOCs to number over 100 at larger sites. Thus, a larger site could conceivably have numerous MGWARS for the same constituents where site-wide subsurface conditions are consistent. **This seems overly and unnecessarily prescriptive and has the potential to cause needless use of resources with no environmental protection value-added. There should be an alternative option to evaluate AOCs in groups or evaluate site-wide MGWARS based on synoptic subsurface conditions and other factors.**" CCNJ/SRIN believe the DEP is vastly underestimating the level of detail and the amount of time required to address the MGW pathway for hundreds of sites which may have groundwater data from potentially 2 decades of site monitoring. It is very disappointing that the DEP in the draft ARS MGW technical guidance document has not addressed SAB's recommendations and continues to be overly and unnecessarily prescriptive. CCNJ/SRIN strongly recommend that the DEP provide an alternative option to evaluate AOCs in groups or evaluate site-wide MGWARS based on synoptic subsurface conditions and other factors for the regulated community. CCNJ/SRIN believe the DEP is vastly underestimating the level of detail and the amount of time required to address the MGW pathway for hundreds of sites which may have groundwater data from potentially 2 decades of site monitoring. **(CCNJ)**	The DEP does not anticipate any change in the number of sites that choose to implement MGWARS options because these options have been in place and used for several years. Likewise, procedures that have been used to address the impact to ground water pathway will remain essentially the same for the Migration to Ground Water Pathway; no changes in the workload or time to address sites is anticipated. The MGW pathway deals primarily with soil samples and the Department is unclear why the commenter believes that is vastly underestimating the level of detail and the amount of time required to address the MGW pathway for hundreds of sites which may have groundwater data from potentially 2 decades of site monitoring. The SAB report in 2011 was based on impact to ground water options dated 2008. In the past years, many changes have been made, including some recommended by the SAB. For example, this guidance document is a compilation of previous documents, as per a recommendation of the SAB. Other suggestions were not implemented as these were not in accordance with Department policy. However, as a matter of practice the Department has indeed allowed the grouping of AOCs if pertinent soil characteristics, both surficial and subsurface are similar and if discharge history does not preclude this process. As with individual AOCs, the grouped AOCs, if shown to meet these criteria, will still need a satisfactory number of samples, for SPLP or other options, as per the Technical Requirements N.J.A.C. 7:26-E, and a minimum of 3 samples only may not be acceptable if the area/volume of the grouped AOCs is large. Section 3.0 of the MGWARS guidance has been modified to clarify this. In addition, see responses to previous similar comments.
17	General			"7:26C 6.4.2. The Department amends a remediation standard after the issuance of a final remediation document and the difference between the new remediation standard and the level or concentration of a contaminant at the property differs by an order of magnitude and the person responsible for conducting the remediation fails to complete further remediation;" The DEP has verbally proposed historic soil samples which exceeded the proposed MGWSRS by 10-fold will require a project review following the Order of Magnitude guidance established by the Brownfield Act. CCNJ/SRIN do not agree with any comparison of proposed remediation standards with historic soil concentrations at inactive or closed sites; order of magnitude rules cannot be applied. CCNJ/SRIN request that the MGWTG be withdrawn until the DEP issues the herein noted documentation required by the APA as part of the rule proposal, so that the regulated community can understand, evaluate, and comment on the social, financial, and legal implications of the Proposed Amendments; otherwise, the regulated community is being denied their due process rights, as required by the APA, in the rulemaking process. **(CCNJ)**	The order of magnitude provision applies to soil remediation standards (soil-water partition) for the soil migration to ground water exposure pathway. The Brownfield Act at N.J.S.A. 58:10B-12.a states "until the minimum remediation standards for the protection of public health and safety as described herein are adopted, the department shall apply public health and safety remediation standards for contamination at a site on a case-by-case basis based upon the considerations and criteria enumerated in this section." The Department has taken the position that as long as default remediation standards do not exist, there are no remediation standards against which site-specific remediation standards can be compared. As such, and untill promulgation of default migration to ground water remediation standards, the order of magnitude evaluation is not applicable for the impact to groundwater exposure pathway. However, upon the adoption of default soil remediation standards (soil-water partition) for the migration to ground water exposure pathway, there will be remediation standards that can be compared against site-specific remediation standards. Accordingly, the order of magnitude evaluation is applicable. An order of magnitude difference between a site-specific impact to ground water standard concentration and a default migration to ground water standard concentration does not automatically require additional remediation. However, an evaluation is required. If the evaluation indicates the remedy remains protective, then no additional remediation is required. The site-specific standard should be compared only to the Migration to Ground Water Soil Remediation Standard, not to the Soil Leachate Remediation Standard. An order of magnitude evaluation may consider site-specific conditions. For historical ground water contamination, evidence of successful ground water remediation could be used as a line of evidence that contaminant sources have been remediated. Use of compliance options such as immobile contaminants, SESOIL and SESOIL/ATD-123 modeling, and SPLP can be used to demonstrate that additional remediation is not required. The Department intends to keep its existing policy concerning when an order of magnitude evaluation would be conducted. For closed cases (cases that have a final remediation document), the Department intends to keep its existing policy concerning when an order of magnitude evaluation would be conducted. For closed sites that implemented a restricted or limited restrictive use remedy (cases that have an institutional control, or an institutional and engineering control), the order of magnitude evaluation would be part of the required biennial remedial action protectiveness certification. For sites that implemented an unrestricted use remedy, the order of magnitude evaluation would be required at the time when a site "re-enters" the Site Remediation and Waste Management Program (for example, when a site is subject to an Industrial Site Recovery Act trigger, when a childcare facility license is up for renewal, and if a property sale requires update of site conditions for loan approval). The order of magnitude evaluation would be conducted pursuant to the Technical Rules at N.J.A.C. 7:26E-3.2(a). Compliance of the Remediation Standards, N.J.A.C. 7:26D, with the Administrative Procedure Act, N.J.S.A. 52:14B-1, is beyond the scope of this technical guidance document.
18	3	TOC	TOC	*3.2.2 Site Soil and Ground Water <u>Analytical</u> Data Evaluation* add Analytical to title of section and TOC **(LSRPA)**	The word "analytical" in the title has been dropped from this option, since other data in addition to analytical data, such as depth to ground water, is used. The wording in this document has been adjusted to be consistent throughout.

19	8	2	0	The DEP recognizes this new guidance document is based on older guidance that was issued to evaluate soil quality using screening criteria for various chemicals along the impact to groundwater pathway. The MGWTG incorporates and replaces 12 previous DEP guidance documents that were issued between June 2008 and May 2014. In addition to these older guidance documents, sixteen (16) technical references are identified in the document. The most recent reference was published in 2017, 1 document is 10 years old, 2 documents are 18 years old and 12 of the documents (75% of the reference list) are more than 22 years old. Establishing new remediation standard pathways should mandate a review of recent scientific literature and a review of historical policy decisions. The SAB technical review memo of October 2011 also recommended a more recent review of the available scientific data; however, the DEP has not accepted that recommendation. The SAB recommendation was ignored in the DEP's December 2011 review memo and continues to be ignored. These observations highlight the DEP's primary goal of establishing remediation standards for enforcement, litigation, and cost recovery purposes. Executive Order No. 63 requires that: "Governmental decisions should be based on the best available data, including scientific data if applicable. Where scientific evidence is an important element in developing or evaluating a rule, State entities should seek out and make productive use of scientific expertise available to them." In light of the 2011 SAB report recommendations and utilizing older guidance documents, the DEP should describe their research methods to evaluate the best available scientific data for the development of this MGWTG for the regulated community. The MGWARS guidance appears to continue to use the position outlined in the December 2011 DEP review memo of the SAB recommendations, which chose to ignore the SAB recommendation of using the best-available science. In addition, the MGWTG should consider all aspects of the fate, transport, degradation, retardation, biodegradation and overall movement of chemicals within the unsaturated zone as well as mixing of chemical leachates with groundwater. **(CCNJ)**	The basis of the procedures used for determination of the Migration to Ground Water Soil Remediation Standards and the alternative standards is explained in the Migration to Ground Water Basis and Background document. While now updated, this information was previously available in the Inhalation standards basis and background document and in the various guidance documents that were posted on the Department website for the Impact to Ground Water pathway. Regarding the commenter statements regarding old documents, the NJDEP continuously reviews new scientific information as it becomes available. Many of the newer citations are now provided via web links, rather than traditional citations. And other relatively new options for the MGW pathway reside in compliance documents, rather than in this document. Nonetheless, it is true that several of the core references date back as far as the commenter states because the current framework on which the standards are based originate in the USEPA Soil Screening Guidance document, which dates back to 1996. While this original document was developed quite some time ago, it provides much of the background for the USEPA Regional Screening Levels, which are still in use today and updated every six months. Older documents do not become invalid just because they are older. They become invalid when newer science replaces older science. Much of the current scientific framework supporting the remediation standards was established in the 1970s and the 1980s, with vapor intrusion being one of the more recent additions in the 1990s. Many of the core assumptions and models inherent in the remediation standards, such those relating to adsorption of contaminants to soil, have not had fundamental or practical updates in recent years. However, improvements in some areas, such as values for input parameters, have been reflected via updates to this guidance. The sources of this newer information is typically documented with web links. Regarding the commenter statements regarding the Science Advisory Board, the SAB comments pertain to 2008 versions of the Impact to Ground Water guidance documents, which are from thirteen years ago. The Department responded to the Science Advisory Board at that time, both in writing and in a meeting. Two updates to the guidance documents have been made since the 2011 New Jersey Department of Environmental Protection Science Advisory Board review, and several of the board's recommendations have been incorporated into current guidance.
20	10	2	1	The MGWTG identifies "certain options require Department pre-approval" prior to implementation. The DEP's requirement to receive pre-approval for technical evaluations that are described in this guidance is contrary to the LSRP model. The LSRPs should be allowed to utilize and document their professional judgement. The MGWTG should remove references to pre-approval by the DEP to the maximum extent possible, to be consistent with the LSRP paradigm, and for use by the LSRP as guidance pursuant to the SRRA. Only four ARS options may be completed (Foc variable calculation, SPLP analysis, immobile chemical analysis and site-specific groundwater analysis). All other parameters are either "locked" by the DEP or require DEP pre-approval. Given the DEP has mandated each AOC must be evaluated individually, on larger projects it is reasonable 3 or more ARS values may be calculated and potentially dozens of interactions with the DEP will be required. The DEP fails to consider the complexity of DEP approval for a single ARS variable modification. CCNJ/SRIN recommend that the DEP re-evaluate the pre-approval process for the ARS MGW and allow LSRPs to utilize their professional judgement. **(CCNJ)**	The Department has the statutory authority to approve the use of an alternative remediation standard at a contaminated site (see The Brownfield Act at N.J.S.A.58:10B-12.f(1)). Additionally, a proposed alternative remediation standard cannot be used until it is approved by the Department. Department staff have developed and reviewed site-specific and alternative remediation standards for many years. Without preapproval requirements, as was the case in the previous rule, submissions of SESOIL and SESOIL/AT123D modeling, for example, frequently contained errors or problems. This often delayed approvals of SI/RIR/RAR reports and RAOs. Pre-approval of complex alternative remediation standard options will minimize such delays and rejection of remediation standards in the submitted reports. It will also lead to more efficient use of financial resources. Other than the preapproval requirements for some options, there are no additional constraints on the professional judgment that an LSRP may exercise.
21	10	2	2	The DEP fails to provide any guidance on the identification and use of Class II-B aquifer characterizations. The MWGTG states "All MGW Remediation Standards are developed to protect the ground water from future exceedances of Ground Water Remediation Standards (GWRS) that may result from leaching of contaminants from the unsaturated soil zone to the underlying ground water."; however, this statement and the guidance fails to recognize that all groundwater is not the same. The proposed definition of "Ground Water" (N.J.A.C. 7:26D 1.5, Definitions) removes a reference to groundwater classifications, Class I, Class II, and Class III. This is the only reference to the three groundwater classifications authorized in N.J.A.C. 7:9C. Neither the Proposed Amendments or the MGWTG include any reference to Class II-B groundwater quality. The MGWTG should be expanded to include a discussion of the three classifications as defined and discussed in the Ground Water Quality Standards Rule. The additional definition may include a cross reference to N.J.A.C. 7:9C 1.5 Ground water classification system and designated uses. CCNJ/SRIN strongly assert that a minimum discussion of groundwater classifications and their use for ARS in the Proposed Amendments, the Basis and Background documents, the ARS Technical Guidance document(s), and policy documents are necessary to accurately characterize all site conditions. The MGWTG should be expanded to provide guidance on the characterization and use of Class II-B groundwater quality standards including procedures to document a Class II-B aquifer characterization process and the determination of MGWARS for Class II-B aquifers. In addition, similar recommendations were provided by the SAB report in October 2011 to the DEP and not addressed in the DEP December 2011 response memo. The DEP response memo included the statement "Reclassification of aquifers requires regulatory amendment and is well beyond the scope of the IGW committee.", which should have been included within the development of the Proposed Amendments, but is continually ignored. CCNJ/SRIN proposes a solution to address SAB's recommendations including the use of site-specific information and human health risk characterization within the current statutory and regulatory requirements. ***See comment #31. (CCNJ)***	The Department disagrees that rule amendments should be expanded to include a definition and discussion of the three ground water classifications as defined and discussed in the Ground Water Quality Standards, N.J.A.C. 7:9C. The development and mapping of ground water classification, including Class II-B, are under the purview of the Ground Water Quality Standards, N.J.A.C. 7:9C, not the Remediation Standards, N.J.A.C. 7:26D. Comments concerning the establishment and mapping of ground water classifications are beyond the scope of this guidance. Further, Section 2.3 states that the ground water must be protected even if it is not being used for potable purposes. The Department also stated this in its response to the SAB report in 2011. However, in multiple sections (for example, 2.4, 4.1, 6.2.1.2) the guidance states that for Class I or Class III ground water, approval of a site-specific GWRS can be obtained from the Department, and that this GWRS may then be used instead of the Class IIA standard to develop a site specific MGWSRS.
22	10	2	2.2	*MGWARS options that do not require approval from the Department prior to use include those utilizing the Soil Water Partition Equation (SWPE), the Synthetic Precipitation Leaching Procedure (SPLP), the Immobile Chemicals Option and the Site Soil and Ground Water* ***Analytical*** *Data Evaluation option.* Add Analytical to title of section and TOC **(LSRPA)**	The word "analytical" in the title has been dropped from this option, since other data in addition to analytical data, such as depth to ground water, is used. The wording in this document has been adjusted to be consistent throughout.
23	11	2	2.3	*Only by determining a site-specific MGWSRS can it be determined whether the pathway is an issue for the site or area of concern in question.* A site-specific MGWSRS is not the only method to determine whether the pathway is an issue; the Immobile Chemicals Option, Capping Options for SVOCs/Metal and VOCs, and Site Soil and Ground Water Analytical Data Evaluation options do not require site-specific MGWSRS. This language should be revised accordingly to account for the aforementioned options. **(LSRPA)**	The sentence in Section 2.3, Background, has been modified to "Soil sampling and comparison to the MGWSRS or MGW Soil Leachate Remediation Standard is the only way to begin investigation as to whether the MGW exposure pathway is potentially an issue for the site or area of concern in question. If there are exceedances, the pathway may be addressed either by using these standards (via either remediation, or compliance options detailed in other guidances), or by using the ARS options discussed in this guidance (see sections 3.1 and 3.2)".

24	11	2	3	The MGWTG states "Only by determining a site-specific MGWSRS can it be determined whether the pathway is an issue for the site or area of concern in question." The declaratory statement is confusing as the MGWTG provides no pathway to reach case closure at a site that has been undergoing remediation prior to the promulgation of MGWSRS, including sites which have been undergoing remediation for several years. The DEP clearly states the proposed remediation standards will support increased enforcement and legal actions (see Summary/Overview section). However, neither the Proposed Amendments nor any available guidance documents describe how a PRCR can comply with the proposed remediation standards without increased difficulty, time, or cost, especially within the context the DEP is seeking additional powers to increase enforcement actions. The MGWTG should be modified to address the DEP's expectations to document when a safe and protective groundwater condition has been reached and an RAO may be issued for an active case. If the MGWTG cannot be expanded, the DEP should delay implementation of the proposed MGW amendments until an MGW attainment guidance document can be reviewed with comments from the regulated community. **(CCNJ)**	The sentence in Section 2.3, Background, has been modified to "Soil sampling and comparison to the MGWSRS or MGW Soil Leachate Remediation Standard is the only way to begin investigation as to whether the MGW exposure pathway is potentially an issue for the site or area of concern in question. If there are exceedances, the pathway may be either addressed using these standards (via either remediation or compliance options detailed in other guidances) or by using the options discussed in this guidance (see sections 3.1 and 3.2)." The purpose of this document is to develop MGWARS. Case closure that involves multiple other pathways and media is beyond the scope of this document. The pathway, including all the options presented in this document, have been used by the regulated community for years to address the migration to ground water exposure pathway, formerly known as the impact to ground water pathway. The actions required to address the pathway (by the regulated community) have not changed in any way simply because the Department has determined that legal enforcement may be more easily undertaken when there are standards versus screening levels. The Department fully expects that the LSRP will use professional judgment in determining which technical guidance documents best serve the site in question, such that human and environmental health and safety are balanced with optimum use of financial resources and within the site-specific time constraints. It is beyond the scope of this document. to discuss ground water conditions and when an RAO may be issued. Attainment/Compliance with the MGWSRS are beyond the scope of this document, just as Ingestion-Dermal or Inhalation Exposure pathway guidance documents do not address how compliance is achieved for these standards. The Department's Attainment/Compliance technical guidance is applicable to the migration to ground water exposure pathway (previously known as the impact to ground water pathway).
25	11	2	3	The MGWTG states an in-place groundwater remedy at an active case is "not connected" to the MGW pathway because the MGWSRS address a "future potential groundwater contamination." This concept that current actions are not connected with future conditions is unreasonable for the thousands of active cases with ongoing groundwater monitoring. This position of a possible event some time in the future exemplifies the DEP's focus on stronger enforcement as described in conversations and the proposed amendment statements (see Proposed Amendments to Remediation Standards, N.J.A.C. 7:26D, DEP Docket Number 01 20 03, Proposal No. PRN 2020 034, Overview statements including "MGWSRS establishes a stronger basis for the Department to enforce the regulated community's compliance with promulgated remediation standards)." The MGWTG should be modified to identify the DEP's expectations of an LSRP's determination of the effectiveness of a groundwater remedial action as well as to assert a safe and protective groundwater condition has been reached and an RAO may be issued. The modified MGWTG should include additional focus on historical groundwater sampling data, soil vapor sampling data, soil vapor sampling techniques, temporal evaluations of biodegradation for soil samples collected several years ago and other lines of evidence to support MGWARS. By focusing on a "future potential groundwater condition" without providing a technique to utilize the comprehensive site dataset, the MGWTG creates a condition where sites which are currently undergoing investigation may potentially be unable to meet the MGWRS. If the MGWTG cannot be expanded to address all site data, the regulated community may potentially be unable to meet the regulatory and mandatory timeframes. The DEP should delay implementation of the proposed MGW amendments until an MGW attainment guidance document can be reviewed with comments from the regulated community. **(CCNJ)**	One sentence in this section was unclear. The sentence "Existing remedial actions address current ground water contamination." has been clarified to read "Existing ground water remedial actions address current ground water contamination" The Department agrees that current actions in the unsaturated zone are connected to future ground water conditions. However, current conditions in the ground water are reflective of existing saturated zone contamination and contamination that was previously present in the unsaturated zone and subsequently migrated to the ground water. The comments on enforcement and ground water remedial action are beyond the scope of this guidance document. Some of the alternative remediation standards options and compliance options do include consideration of ground water data, but compliance options (including soil vapor sampling) are beyond the scope of this document. Specific, practical suggestions relating to new options such as the assessment of biodegradation will be considered during future revisions of this document. Current procedures for remediation or monitoring of ground water are not affected by the requirements of the migration to ground water pathway, just as they were not affected by the impact to ground water pathway in the past. Similarly, procedures to calculate an ARS or employ an MGW compliance option for the migration to ground water exposure pathway will remain nearly the same as they were for the impact to ground water pathway. There will be no changes in the procedures required for an investigator to meet mandatory timeframes. The Department's Attainment/Compliance technical guidance is applicable to the migration to ground water exposure pathway (previously known as the impact to ground water pathway). In addition, the Migration to Ground Water basis and background document is available. The latter document incorporates information that was previously available in the various Impact to Ground Water guidance documents and in the Inhalation basis and background document.
26	11	2	3	The document states "The MGW pathway must be addressed even when an active ground water remedy is in place. Existing remedial actions address current ground water contamination. The MGW pathway addresses the potential for future ground water contamination from the current soil contamination in the vadose zone. Therefore, the two are not connected." The statements imply an active remedial action is insufficient to address chemicals in the unsaturated zone under all conditions. The paragraph should clarify an active groundwater remedy is neither mandated by the DEP nor is an active remedial action ineffective at remediating chemicals within the unsaturated zone. ARS techniques which utilize all historical site data at active cases should be highlighted and expanded in this guidance. By focusing on a "future potential groundwater condition" without providing a technique to utilize the effectiveness of active remediation as well as the comprehensive site dataset, the MGWTG creates a condition where sites which are currently undergoing remediation may not be able to meet the MGWRS. As an example, a groundwater recovery system surrounding a former landfill cannot be addressed via source removal/excavation techniques. An "active ground water remedy" must be "connected" to the comprehensive site dataset. If the MGWTG cannot be expanded to address all active remedial actions and site data, the regulated community may potentially be unable to meet the site's regulatory and mandatory timeframes. The DEP should delay implementation of the proposed MGW amendments until an MGW attainment guidance document or the Migration to Ground Water Basis and Background document can be reviewed with comments from the regulated community. **(CCNJ)**	The statement quoted by the commenter was unclear and has been modified to state "Existing ground water remedial actions address current ground water contamination." Whether or not remediation is required in the unsaturated zone would be determined during site assessment using site data, which may include the use of ground water data in addition to soil data. This guidance is concerned with the determination of migration to ground water alternative remediation standards, which are protective for unrestricted use of the unsaturated zone at the site, using pertinent site data. No further remediation of the unsaturated soil zone would be required, upon attainment of these standards. Requirements for ground water remediation are beyond the scope of this document. Current procedures for remediation or monitoring of ground water are not affected by the requirements of the migration to ground water pathway, just as they were not affected by the impact to ground water pathway in the past. Similarly, procedures to calculate an ARS or employ an MGW compliance option for the migration to ground water pathway will remain nearly the same as they were for the impact to ground water pathway. There will be no changes in the procedures required by an investigator to meet mandatory timeframes. The Department's Attainment/Compliance technical guidance is applicable to the migration to ground water pathway (previously known as the impact to ground water pathway). In addition, the Migration to Ground Water basis and background document is available. The latter document incorporates information that was previously available in the various Impact to Ground Water guidance documents and in the Inhalation basis and background document.
27	14	3	0	The MGWARS does not include any discussion of Class II-B aquifer classifications or the measurable human health risk at many sites. The SAB comments recommended an expanded evaluation of site conditions and human health risk. Within the December 2011 DEP response labeled "Cannot be Implemented" Comment #3, the DEP statement includes "The SAB recommends including risk assessment options (citing N.J.S.A. 58:10B-12.35.t). This is not applicable to developing GWQS which are based on ground water classifications as per N.J.A.C. 7:9C. Also, as stated above, all potable water is required to conform to 10-6 risk level." The DEP's response focused on groundwater classifications and N.J.A.C. 7:9C to eliminate any further evaluation of human health risk and the impact to groundwater pathway. The DEP fails to understand that the current groundwater compliance strategy utilizes a single-point compliance option which is inflexible and unnecessary in many applications. CCNJ/SRIN maintain the discussion and evaluation of the site-specific variables that formulate a "risk assessment option" could be conducted while maintaining compliance with 7:9C, which is contrary to the DEP's response memo dated December 2011. As an example of risk assessment options, the CEA/WRA programs provide a method to identify areas of reduced groundwater quality and communicate human health risks. Additionally, many sites are focused on petroleum hydrocarbons that are less dense than water. Therefore, the potential for vertical transport from a source zone to a drinking water receptor should be included in the formulation of remedial objectives. Decreased groundwater quality issues which may be caused by naturally occurring chemicals of concern should be included in a "risk assessment option". An evaluation of groundwater flux based on the contaminant mass over an area of groundwater flow is also a critical element to quantify the potential human health risk. The DEP's December 2011 response to SAB's specific recommendation is an example of the DEP's desire to avoid direct conversations regarding the details of site characterization and documentation of reasonable compliance requirements. Instead, the DEP provides vague responses that cannot be clearly evaluated based on the technical merits of the subject. The limited evaluation of the SAB comments provides another example of the DEP's focus on enforcement and cost recovery and not on the best available science and protectiveness vs. compliance. CCNJ/SRIN continue to request the MGWARS be withdrawn and all available site-specific information be included within the ARS evaluation of a site.	The document states in Sections 3.0, 4.1, 6.2.1.2 that for Class I or Class III ground water that approval of a site-specific GWRS may be obtained from the Department. Discussion of Class II-B aquifer classifications are beyond the scope of this guidance, as are ground water compliance strategies. Discussion of a method to identify areas of reduced groundwater quality is similarly beyond the scope of this document. In response to the SAB in 2011, the Department explained that an evaluation of groundwater flux based on the contaminant mass over an area of groundwater flow is counter to current Department policy. Compliance issues are beyond the scope of this document.

28	15 35 48	3 6 6	0 1 6	The DEP limitation on SPLP-derived Kd values mandating testing of the highest contaminant concentration or failure of the soil evaluation is technically unjustified and should be amended. The DEP speculates a slightly higher contaminant concentration than the concentrations that were tested "may exceed the adsorption capacity of the soil." The SPLP calculator and the DEP's limitation are overly conservative and present situations of unnecessary soil sampling in an attempt to recreate a soil sample condition, potentially months or years after the initial sample date. The MGWTG should be amended to eliminate the arbitrary limitation of the highest contaminant concentration and allow the LSRP to present a spatial and statistical evaluation of the soil profile and a reasonable linear projection of a leachate concentrations (i.e. a 20% projection of chemical concentration above the maximum concentration that was tested). It should be noted that not all linear projections will calculate an acceptable ARS; however, a linear projection avoids unnecessary and expensive attempts to recreate a chemical-soil condition that may no longer exist. The DEP's reluctance to allow a reasonable and mathematically justified projection supports the Department's true goals as stated in DEP correspondence: "A central component of the proposed rule amendments is the promulgation of indoor air screening levels (for vapor intrusion) and impact to ground water screening levels as remediation standards. This promulgation is necessary for the DEP to legally enforce these screening level values through enforcement actions against recalcitrant responsible parties, as well as through cost recovery actions." **(CCNJ)**	The concern that extrapolating SPLP results to higher contaminant concentrations in soil than those tested may exceed the adsorption capacity of the soil is in fact justified because the adsorption capacity of a soil is finite, and nonlinear adsorption behavior is commonly observed. This is one of the limitations in using the Kd value instead of the Freundlich or Langmuir relationships, which can account for reduced adsorption of contaminants at higher concentrations in soil as adsorption capacity is approached. Unfortunately, the necessary information to use these other relationships is generally not available. The suggestion to allow a procedure such a 20% extrapolation of SPLP concentration data is reasonable but it is difficult to defend a particular percentage (Why not 30%? Why not a factor of 2?). The NJDEP has taken another approach to deal with this issue, as explained in item 7 of Section 6.6 of the guidance document. Often, SPLP analysis is conducted at the beginning of site investigation with samples that are suspected to contain the highest concentrations of contaminants. However, since it may be difficult to determine the best samples to test via SPLP in advance, a portion of each soil sample is typically held for follow-up SPLP testing once it is determined which samples contain the highest concentration of contaminants. In cases where reserve soil is not available, or the holding time has expired, the investigator may return to the site and resample the location of interest for SPLP testing. The newer sample results at a particular location may replace the old results if the contaminant concentrations observed are lower than those observed initially. For volatile and degradable contaminants in particular, it is recommended to resample critical locations because current concentrations may be lower than those initially observed, especially if the initial sampling took place some time ago. As the commenter mentions, old sample results may not reflect current conditions at the site. The SPLP procedure has been used in this manner for many years without difficulty. The final portion of the reviewer's comment is inappropriate and is beyond the scope of this guidance.
29	16	3	1.1	The MGWTG and the proposed amendments accurately identify "assumptions are made about representative conditions on a site situated in New Jersey. The conditions at any given AOC or site may vary and it may be beneficial to use AOC- or site-specific data to generate an MGWARS." However, the DEP limits the LSRP's ability to alter the physical parameters to accurately characterize site-specific conditions. One example of a parameter that is overly conservative and unjustified is groundwater temperature. Groundwater temperature affects the rate of chemical volatilization, the rate of diffusion of chemicals in groundwater, and the rate of diffusion of chemicals in the air phase. An elevated temperature will create an exaggerated pattern of chemical movement. The DEP selected an average groundwater temperature of 25 degrees C (77 degrees F), which was the same value selected by the USEPA to represent a national average. The NJ Geological and Water Survey (NJGWS) has conducted multiple groundwater monitoring events over many years to provide a more realistic groundwater temperature. One NJGWS study, Ambient Major Ions of New Jersey, Series DGS05 2 (https://www.nj.gov/dep/NJGS/geodata/dgs05 2.htm), provides 5 years of groundwater sampling from 150 wells across New Jersey. The MGWTG should be amended to allow the LSRP to investigate site-specific groundwater temperature and adjust the chemical properties to accurately represent site-specific conditions. **(CCNJ)**	Soil organic carbon, soil pH, the length of the site parallel to ground water flow, the dilution-attenuation factor, and the soil adsorption coefficient (via the SPLP test) may be adjusted to reflect site-specific conditions under the partition equation option discussed in this section. Other ARS options allow one or more of the following additional site parameters to be adjusted to reflect site-specific conditions: soil texture, soil intrinsic permeability, soil effective property, soil pore disconnectedness index, site size, depth to groundwater, location of contamination and location-specific climate data. The Department does not use the ground water temperature in the development of default or alternative migration to ground water soil remediation standards. The unsaturated soil zone is the media of interest for the migration to ground water exposure pathway soil remediation standards. This zone extends from the water table to the soil surface, and it exhibits a variable temperature as a function of depth and time. Values for chemical properties are generally reported at 25°C, and these values are typically used as reported for environmental assessment in the unsaturated soil zone. The Department is simply using the USEPA regional screening level values for chemical properties.
30	16	3	1.1	The MGWTG and the proposed amendments accurately identify "assumptions are made about representative conditions on a site situated in New Jersey. The conditions at any given AOC or site may vary and it may be beneficial to use AOC- or site-specific data to generate an MGWARS." However, the DEP limits the LSRP's ability to alter the physical parameters to accurately characterize site-specific conditions. One example of a parameter that is overly conservative and unjustified is air-filled soil porosity. - - The DEP selected an air filled soil porosity of 15% for all soils in New Jersey. The USEPA calculations utilize an air filled porosity of 28%. This wide variation in soil characteristics is not justified. The DEP selected a water-filled soil porosity of 23% for all soils in New Jersey. The USEPA calculations utilize two water-filled porosity estimates: 15% when evaluating the soil saturation limit and 30% when evaluating the soil to groundwater portioning effects. The DEP does not justify the selected water-filled porosity value and fails to evaluate a range of effective porosity levels in compacted soils. The MGWTG should be amended to allow the LSRP to investigate site-specific soil properties to represent site-specific conditions.**(CCNJ)**	Soil organic carbon, soil pH, the length of the site parallel to ground water flow, the dilution-attenuation factor, and the soil adsorption coefficient (via the SPLP test) may be adjusted to reflect site-specific conditions under the partition equation option discussed in this section. Other ARS options allow one or more of the following additional site parameters to be adjusted to reflect site-specific conditions: soil texture, soil intrinsic permeability, soil effective property, soil pore disconnectedness index, site size, depth to groundwater, location of contamination and location-specific climate data. Air-filled and water-filled soil porosity are not amenable to site-specific determination modification because of large short-term, seasonal variation, and spatial variation of these parameters. Furthermore, practical and/or standard methods are not generally available for these parameters nor likely to be used by investigators. As documented discussed in the Migration to Ground Water basis and background document, the sensitivity of the MGWSRS to air-filled porosity, water-filled porosity and soil bulk density is small. The SESOIL model can simulate temporal and spatial variations in air-filled and water-filled soil porosities based on location-specific weather and climate data. The values for air-filled and water-filled soil properties are not overly conservative and unjustified. The basis for these parameters is explained in the Migration to Ground Water Basis and Background document. New Jersey uses an air-filled porosity of 18 percent (not 15 percent), while the USEPA (in its Soil Screening Guidance) uses values of 13 percent and 28 percent (not just 28 percent). For water-filled porosity, New Jersey uses a value of 23 percent, while the USEPA uses values of 15 percent and 30 percent. New Jersey porosity values were calculated for a sandy loam soil, while the USEPA used a loam soil. Loam soil is not appropriate as a mid-range soil texture in New Jersey. As explained in the Department's basis and background documents, air-filled and water-filled porosities were calculated for a sandy loam soil and New Jersey climate using procedures and data sources contained in the 1996-2002 USEPA Soil Screening Guidance documents, along with New Jersey Geological Survey methodology regarding New Jersey climate and ground water recharge. The Department has evaluated of range of values for all input parameters used for calculation of the remediation standards in the sensitivity analyses reported in the various basis and background documents. Concerning the comment pertaining to two different soil moistures used for soil-water partitioning calculations and soil saturation limit calculations (used in the USEPA Soil Screening Guidance document), the soil saturation limit calculation in the USEPA document was actually contained in the inhalation pathway section of that document, and the same soil moisture was used for both the inhalation criteria and the soil saturation limit calculation for that pathway. The Department evaluates contaminant concentrations in a soil sample by comparing measured contaminant concentrations against all remediation standards and also against the soil saturation limit (which is used for both the inhalation pathway and the migration to ground water pathways). This evaluation needs to be conducted using the same soil moisture assumptions for all comparisons. Therefore, the New Jersey-specific soil moisture content is used for migration to ground water standards, inhalation standards, and soil saturation limit calculations.
31	16	3	1.2	The DEP has established a groundwater DAF of 20 "based on an assessment of New Jersey aquifers and ground water recharge rates. The default infiltration rate is 11 inches/year, calculated for sandy loam soil, as described in the Migration to Ground Water Basis and Background document." The MGWTG reference list does not appear to include the DEP's assessment of aquifers and groundwater recharge rates which derived the default infiltration rate. The MGWTG should be expanded to reference the source of the default infiltration rate, as well as the soil characteristics that may provide the basis to determine a site-specific infiltration rate. Site-specific grain size data should be used along with surface grading, site construction and surface cover data to determine a site-specific infiltration rate. **(CCNJ)**	The basis of the DAF value of 20 is explained in the Migration to Ground Water Basis and Background document, and was previously contained in the guidance document entitled "Development of a Dilution-Attenuation Factor for the Impact to Ground Water Pathway, Version 2.0 - November 2013". The determination included an assessment of data from the Kirkwood-Cohansey aquifer in southern New Jersey, an assessment of data presented in the USEPA Soil Screening Guidance document pertaining to American Petroleum Institute's (API's) hydrogeologic database (HGDB), EPA's database of conditions at Superfund sites contaminated with DNAPL, and the use of New Jersey Geological Survey GSR-32 methodology for determination of ground water recharge rates. There are no routinely used methodologies to determine site-specific infiltration rates, and as stated in section 5.3.2. of this guidance document, consultation with the Department is required prior to adjusting this parameter. An infiltration rate of 11" a year was found to be representative of many of the most common soil textures in New Jersey.
32	19	3	3.2.2	3.2.2 Site Soil and Ground Water *Analytical* Data Evaluation add Analytical to title of section and TOC **(LSRPA)**	The word "analytical" in the title has been dropped from this option, since other data in addition to analytical data, such as depth to ground water, is used. The wording in this document has been adjusted to be consistent throughout.

33	23	4	2.1	Temperature is an important parameter in groundwater and influences a number of chemical processes in the subsurface including the rate of chemical volatilization, the rate of diffusion of chemicals in ground water, the rate of diffusion of chemicals in the soil gas and in the dissolved phase in soil, and chemical solubility. An elevated temperature will create an exaggerated pattern of chemical movement. The Draft Guidance uses an average groundwater temperature of 25 degrees C (77 degrees F), which was the same value selected by the USEPA to represent a national average. Experience shows that this value is unreasonably high for groundwater in New Jersey. The NJ Geological and Water Survey (NJGWS) has conducted multiple groundwater monitoring events over many years to provide a more realistic ground water temperature. One NJGWS study, Ambient Major Ions of New Jersey, Series DGS05 2 (https://www.nj.gov/dep/NJGS/geodata/dgs05 2.htm), provides 5 years of groundwater sampling from 150 wells across New Jersey. The DEP's Capping of Volatile Contaminants for the Impact to Ground Water Pathway guidance document states "Henry's law constants at 13°C are used because this is the average temperature of shallow ground water in New Jersey." (Emphasis added) The DEP should review and amend the MGWSRS and MGW Leachate calculations using a more representative groundwater temperature, such as 13-Deg C, which is consistent throughout the standards and guidance documents. In addition, the proposed Basis and Background documents should discuss the use of the Clausius-Clapeyron relationship for Henry's constant, Koc adjustments for temperature and chemical mixtures, and other techniques to modify the physical parameters of each chemical. LSRPA recommends that the DEP revise the MGWSRS and MGW Leachate calculations using a more representative groundwater temperature, such as 13-Deg C, which is consistent with other NJDEP guidance documents. **(CCNJ, LSRPA)**	The "Capping of Volatile Contaminants for the Impact to Ground Water Pathway" document, and the vapor intrusion guidance, use 13 degrees Celsius to predict volatilization of contaminants from ground water. Therefore use of a ground water temperature is appropriate in those guidance documents. The migration to ground water ARS options presented in this document are concerned with chemical transport in the vadose zone, which extends from the water table up to the soil surface, and this zone exhibits a variable temperature as a function of depth and time. Therefore, the use of the ground water temperature is not appropriate. Values for chemical properties are generally reported at 25°C, and these values are typically used as reported for environmental assessment in the unsaturated soil zone. The Department is simply using the commonly used standard temperature of 25 degrees recommended by the USEPA for the vadose zone from its Soil Screening Guidance and its Regional Screening Levels. At a given temperature, physical parameters for chemicals are considered constants, and are not subject to site-specific variability. The Koc parameter applies to a specific contaminant, not a mixture.
34	32	5	3.2	The MGWTG asserts "The Department will not allow impermeable cover to be considered in the development of the infiltration rate; for example, paving, which may result in a reduced infiltration rate, would not be allowed to modify the infiltration rate." Asphalt paving is normally characterized as a low-permeability cover, but not an impermeable cover. The DEP should amend the guidance to define the term "impermeable cover" in the units of vertical permeability, i.e. darcies, cm^2, m^2, etc.**(CCNJ)**	The use of impermeable or low permeability caps is not allowed to be used to adjust the infiltration rate for calculation of the DAF because the alternative standard calculated is for unrestricted use of the site into the future (that is, a cap is not required). Furthermore, no approved procedures for calculating infiltration rates through material such as concrete or asphalt are available. The wording has been changed to state "low or impermeable cover". When it is desired to use caps to comply with the Migration to Ground Water pathway, the capping compliance documents should be consulted.
35	32	5	3.2	The MGWTG asserts "The Department will not allow impermeable cover to be considered in the development of the infiltration rate; for example, paving, which may result in a reduced infiltration rate, would not be allowed to modify the infiltration rate." Section 3 of the Capping of Volatile Contaminants for the Impact to Ground Water Pathway guidance document, January 2019, v 1.1 states: "New or existing caps must be low permeability caps and prevent infiltration of precipitation and runoff." (Emphasis added) The DEP must amend or expand the guidance to explain how soil capping in order to protect individuals from dermal exposure will be integrated into the MGWSRS/ MGWARS compliance program. **(CCNJ)**	This section discusses the development of an MGWARS using modification of the DAF (which does not need a deed restriction and engineering control), which is different from using a compliance option such as capping. Infiltration values resulting from low or impermeable covers such as paving are not allowed in the development of a site specific MGWARS, because MGWARS do not require a engineering control. A cap would have to be maintained and be subject to a deed restriction. If a compliance option (which is beyond the scope of this guidance document) such as capping is chosen, the compliance and attainment and capping guidances should be followed. Amending the capping guidance is beyond the cope of this guidance; however, all exposure pathways must be addressed on the site.
36	38	6	6.3.2	*It is recommended that soil samples be taken from intact soil cores obtained using direct push methods or split- spoon methods. Direct push methods collect soil cores in plastic liners.* The above language should be modified as noted below: *It is recommended that soil samples be taken from in-situ soils or intact soil cores obtained using direct push methods or split- spoon methods. Direct push methods collect soil cores in plastic liners.* **(LSRPA)**	Agreed. Modified.
37	49	7	1	SESOIL may be used to demonstrate that a specified existing or proposed concentration distribution of contaminant in soil will not result in future contamination of ground water above the GWRS. The MGWTG does not provide any additional methods or models to demonstrate existing or proposed chemicals above the water table will or will not result in future contamination of groundwater. SESOIL is a Fortran based computer program that cannot be utilized by the majority of professionals without the purchase of a software interface program SEVIEW. SEVIEW is a commercially available software program that may be purchased for approximately $1,500 for the computer program alone. In addition to software purchasing, software training and experience is required to utilize this ARS technique. The MGWTG should offer alternative vadose zone transport models to the LSRP, with each program providing all parameter variables allowed in SESOIL and a process to utilize alternate fate and transport programs. Software programs that are mandated for use should be provided without cost to the regulated community. **(CCNJ)**	Regarding the statement pertaining to this SESOIL option that "The MGWTG does not provide any additional methods or models to demonstrate existing or proposed chemicals above the water table will or will not result in future contamination of groundwater", this guidance document in fact provides six other options. The SESOIL model has been in routine use since 2008 and at this point has been used to evaluate hundreds of sites in New Jersey. Complaints have not been voiced about the cost of the software as it is simply considered a cost of doing business. For those investigators who do not wish to purchase the software or run the model themselves, this aspect of site investigation can be contracted out to a SESOIL specialist. This has been observed to be the practice for a certain percentage of cases in New Jersey. In addition to the SESOIL guidance presented in this document, in-person training has been available nearly every year over the past decade. LSRP continuing education credits are available from this training. Additionally, the NJDEP frequently answers inquiries about applying the SESOIL model. The Department monitors the availability of additional vadose zone transport models that meet the needs of the Site Remediation Program and have an adequate user interface containing the necessary input and output features. In the meantime, the Remediation Standards rule states in sections III(b)6 and III(c)9 of Appendix 8 that alternative models may be used following consultation with and approval by the Department.
38	51	7	3	The MGWTG and the proposed amendments accurately identify "assumptions are made about representative conditions on a site situated in New Jersey. The conditions at any given AOC or site may vary and it may be beneficial to use AOC- or site-specific data to generate an MGWARS. However, the DEP limits the LSRP's ability to alter the physical parameters to accurately characterize site-specific conditions while simultaneously allowing the SESOIL program to alter the physical parameters of intrinsic permeability, soil pore disconnectedness and effective porosity. SESOIL utilizes correlations based on the textural properties of the soil. The MGWTG should be amended to allow the LSRP to investigate site-specific soil properties to more accurately represent site-specific conditions without prior DEP approval. **(CCNJ)**	Site-specific values for soil parameters may be determined as explained in Section 7 and in Appendix D. The SESOIL model does not alter the physical parameters of intrinsic permeability, soil pore disconnectedness index, and effective porosity. These are input parameters used by the SESOIL model. The model documentation provides default values for these parameters based on USDA soil texture, which are calibrated to the SESOIL model. These values are generally recommended for use. Prior approval of these parameters are not specifically required; rather, it is the SESOIL model submissions that require prior approval, which may or may not include site-specific values for soil parameters. SESOIL prior approval is required because a significant percentage of SESOIL submissions continue to have errors or incomplete information, although the percentage of submissions with problems has been declining over the years. The problems with the submissions may or may not include problems with site-specific soil parameters.

39	51	7	3	The MGWTG should be amended to allow the LSRP to investigate site-specific soil properties to more accurately represent site-specific conditions without prior DEP approval. A similar recommendation was provided by the SAB in October 2011, however, the December 2011 DEP memo provided the following response to the comment: "The Department believes that the assumptions employed are not conservative but typical. Documentation to this effect has been provided in the past and will continue to be provided as changes to the IGW framework." The DEP should provide specific responses to the SAB and CCNJ/SRIN comments including the proposed Basis and Background document, rather than the generic statement "Documentation to this effect has been provided in the past." **(CCNJ)**	Site-specific values for soil parameters may be determined as explained in Section 7 and in Appendix D. Prior approval of these parameters are not specifically required; rather, it is the SESOIL model submissions that require prior approval, which may or may not include site-specific values for soil parameters. SESOIL prior approval is required because a significant percentage of SESOIL submissions continue to have errors or incomplete information, although the percentage of submissions with problems has been declining over the years. The problems with the submissions may or may not include problems with site-specific soil parameters. The statement quoted from the Science Advisory Board relates to default parameter assumptions, not site-specific parameter determinations. The Department's Science Advisory Board's (SAB) comments pertain to 2008 versions of the Impact to Ground Water guidance documents, which are from thirteen years ago. The Department responded to the Science Advisory Board at that time, both in writing and in a meeting. Two updates to the guidance documents have been made since the 2011 New Jersey Department of Environmental Protection Science Advisory Board review, and several of the board's recommendations have been incorporated into current guidance. The Basis and Background document which describes the basis of the default parameter values is now available. Most of this information has been available for many years in the previous Impact to Ground Water guidance documents and in the previous Inhalation Remediation Standards Basis and Background Document.
40	52	7	3	The guidance document proposes the set-up of the SESOIL program using a "one-month half-life (biodegradation rate constant of 0.023 days-1) in both the liquid and solid phases." The DEP Basis and Background document which is unavailable for review or the MGWTG revisions should include a reference and rationale for the selection of one biodegradation rate for all volatile hydrocarbons including naphthalene and 2-methyl naphthalene, but excluding 1-methyl naphthalene. Biodegradation is an important, site-specific parameter that should be evaluated and selected by the LSRP using professional judgement, researched biodegradation rates, site-specific testing or other techniques. **(CCNJ, LSRPA)**	Biodegradation is a highly variable, highly site-specific parameter that is not amenable to routine determination in the unsaturated soil zone without research-level investigation. However, volatile hydrocarbons generally exhibit fairly rapid degradation in the soil. Based on a review of reported unsaturated soil zone degradation rates reported by Howard et al. (1991) (see references in the Migration to Ground Water Basis and Background document), it was observed that for volatile hydrocarbons, half-lives were generally one month or less. Picking contaminant-specific half-lives for these chemicals implies a more accurate value for each contaminant than actually exists without site-specific investigation. A one-month half life (rate constant of 0.023 days-1) was judged to be adequately protective for these contaminants while still providing rapid attenuation for volatile hydrocarbons in the unsaturated soil zone. Using a more accurate degradation rate for these contaminants would require a more detailed site investigation and the use of approved methodologies for measurement of degradation. The Department has not approved methods for site-specific biodegradation rates at this time. The one-month half-life for these contaminants has been used with the SESOIL model for many years and has been very useful in addressing residual levels of these contaminants. 1-methylnaphthalene is not mentioned because it is not on the list of regulated contaminants.
41	62 65 86 99	7 7 9 Appendix E	4 6 2 NA	In multiple locations in the MGWTG, the DEP references the MGWSRS were selected to protect all groundwater from any "future impact" following leaching and migration of chemicals from the unsaturated zone into the groundwater. By reference, the DEP defines a "future impact" as any migration to groundwater that may occur at any time which is less than 100 years after the initial release. It Is unreasonable for the DEP to ignore projects with several years of data collection and site characterization. The MGWTG does not include any sub-categorization of sites. CCNJ/SRIN recommend that the MGWTG identify and describe alternative remediation standard evaluations for at least three types of sites, including a) Recent releases that may have occurred in less than 5 years, b) Older releases that may have occurred more than 5 years ago but undergoing investigations less than 2 years, and c) Older releases that occurred more than 5 years ago and have site characterization and monitoring data over a period greater than 2 years. This temporal characterization is important to understand the complete conceptual site model for a site and to allow the LSRP to best evaluate soil quality and to project the date when the maximum migration to groundwater will or has occurred in the past. The DEP should also delay finalization of the new remediation standards until data evaluation techniques that utilize both current and historic data which more accurately characterize site conditions and the risk to human health and the environment are documented and reviewed by the public and the LSRP community. A similar recommendation was provided by the SAB in October 2011 and not addressed in the DEP December 2011 response memo. The DEP response memo included the statement "Reclassification of aquifers requires regulatory amendment and is well beyond the scope of the IGW committee.", which should have been included within the development of the Proposed Amendments, but is continually ignored. **(CCNJ)**	The Department does not "ignore projects with several years of data collection and site characterization". This data may be used as site-specific information when determining alternative remediation standards. The Department provides for "sub-categorization" of sites in the sense that different site scenarios will be best addressed with different alternative remediation standard options. The comment recommending categorizing sites according to temporal characteristics is beyond the scope of this document, which is concerned with the determination of alternative remediation standards. The commenter does not explain how this categorization will be used to determine such standards. Furthermore, the suggested temporal characterization ignores the wide variability in the mobility of contaminants, which would fundamentally affect the time scales of interest. The commenter statement that current and historic data should be used to characterize site conditions and human health risk is not a specific recommendation for another procedure to determine alternative remediation standards, which is the purpose of this document. Current data may supersede historic data when it indicates conditions at a site (and risk to human health) have changed since the initial investigation was completed. Regarding the commenter statement pertaining to the Science Advisory Board, the SAB comments pertain to 2008 versions of the Impact to Ground Water guidance documents, which are from thirteen years ago. The Department responded to the Science Advisory Board at that time, both in writing and in a meeting. Two updates to the guidance documents have been made since the 2011 New Jersey Department of Environmental Protection Science Advisory Board review, and several of the board's recommendations have been incorporated into current guidance. The Department disagreed with other comments made by the board, and some recommendations made by the board were in conflict with department policies or regulatory requirements. While procedures for reclassification of aquifers is beyond the scope of this document, alternative ground water remediation standards for aquifers other than Class IIA may be used in the determination of migration to ground water alternative remediation standards, as is discussed at several locations in this document.
42	67	8	1	The ability to develop MGWARS for an AOC or site-wide while also addressing the direct exposure and vapor soil remediation standards in soil is critical to the protection of human health in a reasonable and technically defensible manner. The MGWARS must have the ability to consider capping as a compliance remedy for remediation of volatiles, semi volatiles, and inorganic. However, the MGWTG simultaneously mandates the use of SESOIL as the only acceptable soil leaching and eliminating capping of an AOC while eliminating impervious or low permeability caps: "When using this guidance, the AOC may not be capped, either currently or prior to the expiration of the CEA, with an impervious or low permeability cap." CCNJ/SRIN request confirmation the DEP is mandating only permeable caps for the migration to groundwater ARS evaluation with SESOIL. If CCNJ/SRIN's interpretation of the MGWTG is accurate, we disagree with the DEP's position not to allow low permeability caps at a site with an MGW exceedance. The DEP's limitation will affect land use decisions as AOCs must be remediated for the MGW pathway or limited to grass covered areas, without technical justification or evaluation of all exposure pathways. **(CCNJ)**	The quoted statement in this comment ("…the AOC may not be capped…") applies only to application of the SESOIL/AT123D option in Section 8. The statement has been clarified in the guidance document.
43	89	10	1	This section describes the use of site soil and groundwater analytical data evaluation to demonstrate that the MGW pathway has been addressed on an AOC- or site-specific basis. Unfortunately, the section only offers a pathway to define when the soil has reached a stable and acceptable condition based on groundwater sampling. The MGWTG is inadequate as the guidance provides only a digital outcome from groundwater sample data; groundwater has reached potable concentrations OR groundwater and soil are not remediated. There is no discussion of the use of historical groundwater quality trends to characterize the potential for migration to groundwater based on site-specific information. The following minimum questions should be addressed in the revised MGWTG. **(CCNJ)**	The site conditions described in this section must be demonstrated in order to use this Alternative Remediation Standard (ARS) option. If site conditions do not correspond to the required conditions of this option, another ARS option should be used. Historical ground water data may be used in migration to ground water compliance options, which include consideration of historical ground water data and/or the use of caps. These compliance options are located at http://www.nj.gov/dep/srp/guidance/rs/. Responses to the five specific questions posed in the remainder of this comment are provided below.

44	89	10	1	How will site-specific groundwater quality data be integrated with the migration to groundwater pathway soil results? **(CCNJ)**	The use of ground water quality data is dependent on what is being done regarding the migration to ground water exposure pathway. The evaluation of the migration to ground water pathway is concerned with potential future ground water contamination, not the current state of the ground water, so only in some cases are current ground water quality data directly used. Ground water quality data are not used when comparing the Migration to Ground Water Soil Remediation Standards to soil sample results, soil-water partition equation alternative remediation standard results, alternative remediation standard results when modifying the dilution-attenuation factor, when determining an alternative remediation standard using the Synthetic Precipitation Leaching Procedure (SPLP) or Seasonal Soil Compartment Model options, or when using the immobile chemical option. Ground water quality data are directly used in conjunction with migration to ground water soil results for the Seasonal Soil Compartment Model/Analytical Transient 1-,2-,3-Dimensional Model option (SESOIL/AT123D), in that the current ground water concentrations are used in the SESOIL/AT123D model. Ground water quality data are also used with the site-soil and ground water monitoring data evaluation option (to demonstrate no existing ground water contamination). Ground water quality data are also used in the volatile and semi-volatile capping compliance options, and in another compliance option entitled "Volatile Organic Contamination including methyl tertiary butyl ether (MTBE) and tertiary butyl alcohol (TBA) derived from discharges of Petroleum Mixtures." The Department is not including the referenced compliance options in this technical guidance document. For all the of the options mentioned above where ground water data is used (except the compliance options), the "Alternative Remediation Standards Technical Guidance for the Migration to Ground Water Pathway" provides further details (https://www.nj.gov/dep/srp/guidance/rs/). The compliance options involve either the demonstration of uncontaminated ground water, the demonstration of non-increasing contaminant concentrations in ground water, or the demonstration of monitored natural attenuation. Department guidance documents for the compliance options are available on the remediation standards web page (https://www.nj.gov/dep/srp/guidance/rs/).
45	89	10	1	It is reasonable to have a site where historic soil sampling exceeds the proposed migration to groundwater soil remediation standard, while the groundwater is nearing remediation standards. Will the DEP mandate additional sampling to confirm the Contaminants of Concern in soil are below the migration to groundwater standard? **(CCNJ)**	The answer to the commenters' question depends on what is being done regarding the migration to ground water exposure pathway, which option is being used, and whether alternative remediation standards are being used. When the Seasonal Soil Compartment Model/Analytical Transient 1-,2-,3-Dimensional Model option is employed, resampling the soil is not necessary if ground water concentrations have dropped below the ground water remediation standards by the end of the ground water classification exception area time period. Resampling of soil is also not necessary when sites with contaminated ground water qualify for the volatile or semi-volatile capping compliance options and the cap is left in place. Another compliance option "Volatile Organic Contamination including methyl tertiary butyl ether (MTBE) and tertiary butyl alcohol (TBA) derived from discharges of Petroleum Mixtures" also does not require soil resampling. The compliance options are beyond the scope of this rule, but guidance documents pertaining to their use may be found at (https://www.nj.gov/dep/srp/guidance/rs/).
46	89	10	1	Similarly, if the groundwater quality has stabilized under a monitored natural attenuation process, but historic soil concentrations exceed the proposed migration to groundwater soil remediation standard, will the DEP require retraction of a groundwater RAP? Will the DEP require additional remediation of the soil to address groundwater quality? Under what conditions can the LSRP implement professional judgement? **(CCNJ)**	Ground water permits are not affected by the migration to ground water exposure pathway. Following the procedures regarding the migration to ground water exposure pathway do not require retraction of a ground water remedial action permit. Additional remediation of soil may or may not be required depending on the migration to ground water alternative remediation standard option or compliance option employed which may include long term monitoring. See Department guidance documents (https://www.nj.gov/dep/srp/guidance/rs/) for details. Describing the conditions under which professional judgment may be employed is beyond the scope of this guidance document. Current procedures regarding professional judgment remain the same.
47	89	10	1	The following statements are included in the very short section 10 that describes the DEP's opinion of the connection of groundwater quality and the MGW soil quality: "When the current contaminant distribution represents the worst case conditions with respect to the potential for ground water contamination, and when the groundwater is still uncontaminated, there is no further need to investigate the MGW pathway. This narrative option **is the only option to address the MGW pathway using current ground water conditions**. It may be used for all contaminants." (**Emphasis** added) The only 2 outcomes from this option is to continue to collect soil samples (Outcome 1) or continue to collect groundwater samples until no exceedances of the applicable GWRS occurs. These two outcomes appear directly contrary to the intent of the document, an Alternative Remediation Standard guidance document. The narrative descriptions and the two possible outcomes highlight the fact that the DEP has not fully considered the practical and financial implications of this new soil standard pathway. CCNJ/SRIN request the MGWTG be expanded to include a more comprehensive view of the interconnection between chemicals in the unsaturated zone and the groundwater quality including the use of historical groundwater quality data, the use of both permeable and impermeable caps and additional techniques to document alternative remediation standards. **(CCNJ)**	This option described in this section is the not the only Alternative Remediation Standard (ARS) Option to address the MGW pathway using current ground water conditions. The SESOIL/AT123D option also uses current ground water conditions. For other ARS options, the current ground water conditions are not used because they do not necessarily reflect potential future ground water contamination from soil contamination located further above the water table. The option described in this section is the only option in which there is no potential for future ground water concentrations to become worse than currently observed, since the highest concentrations of vadose contamination are already in contact with the top of the water table. If site conditions meet the criteria described in this option, the migration to ground water pathway has been addressed. There is no need for future soil or ground water sampling. This option has been used for over a decade without difficulty. If the site conditions do not match the criteria described in this option, another migration to ground water alternative remediation standard option may be used. The use of caps and historical ground water data for the migration to ground water exposure pathway are used in compliance options and discussed in separate guidance documents located at http://www.nj.gov/dep/srp/guidance/rs/.
48	89	10	2	In several sections of the MGWTG, the guidance identifies an important condition when the "highest contaminant concentrations are located at the water table." The DEP should define the term "at the water table" as the phreatic groundwater elevations over time at an AOC plus the capillary fringe above the phreatic surface. Multiple researchers have investigated average capillary zones based on soil textures including references provided in the Capping of Volatile Contaminants for the Impact to Ground Water Pathway guidance and the Vapor Intrusion Guidance documents. Similar recommendations were provided in the SAB review in October 2011 including "Clarify technical terms/concepts of the Saturated zone (e.g., includes capillary fringe, seasonal variation, etc.)" and "clarify technical terms/concepts of define "at the water table" (e.g., immediately above the saturated zone, including capillary fringe, etc.)." The quotes exemplify the direct recommendations and definitions that were ignored within the DEP December 2011 response memo, as well as the MGWTG document. In addition, multiple DEP employees have verbally defined the water table as the measured/calculated water level elevation based on single point measurements, leading to misunderstanding of the soil quality in communication with groundwater. CCNJ/SRIN request the MGWTG be withdrawn and expanded to include these critical recommendations for the regulated community. **(CCNJ).**	This condition mentioned in the first sentence of the comment only applies to the option listed in this section "Site Soil and Ground Water Data Evaluation Option". Generally, the depth to the water table reported in site investigations are either reported at a single point in time, or the depth is monitored over time and the range and average values are reported. This information is used by the Department. Generally, the exact depth of the transition between the true saturated zone and the capillary zone, and the extent of the capillary zone, is not determined or reported, and would require additional investigation in the field. Therefore, the more detailed suggestion mentioned by the SAB regarding the capillary zone has not been practical to implement. Seasonal variations in the reported depth to ground water may be used as appropriate depending on the scenario being modeled, the ARS option being used, and whether or not the ground water is currently contaminated. For sites that have time-dependent depth to ground water data, the Department has been consulted by the investigator when there is a question pertaining to the appropriate value for the depth to ground water to be used. This approach has been in use without difficulty for over a decade.
49	98	Appendix D	NA	Effective porosity is a principal variable when evaluating groundwater transport in porous media. The DEP references an ASTM standard test method that is currently not available for undisturbed soil cores. CCNJ/SRIN recommend that Appendix D include guidance that an LSRP's professional judgement will be acceptable when investigating site-specific effective porosity values until ASTM or a similar agency publishes a standard test method. **(CCNJ)**	The LSRP may work with the NJDEP on a site-specific basis if it is felt that a site-specific porosity method is necessary other than the one mentioned in this section. Wording to this effect has been added to this Appendix. Default effective porosity lookup values are already available for the various soil types, and have been routinely used. Since the time that the Deartment has idetified SESOIL as an ARS option, there has never been a request to use a site-specific soil porosity, because of the difficulty in its determination, and its variability with depth.
50	99	Appendix E	NA	The appendix includes the following policy statements that are confusing and should be clarified: "Previously, the end point for ground water protection used for all calculations was the health-based Ground Water Quality Criterion for the contaminant in question. The end point has been changed to the Ground Water Remediation Standard, which takes into account not only the health-based Ground Water Quality Criterion but the Practical Quantitation Limit as well, and uses the higher of the two (GWRS) when calculating a MGWSRS." The statements appear to indicate post-remedial soil sampling is the mandatory "end-point" for the migration to groundwater aspect of an environmental investigation. Post remedial soil sampling following groundwater monitoring is excessive and should be clarified. At a minimum, the MGWTG should describe the DEP's expectation of what defines the "end-point" of an environmental investigation and the requirements to document the end-point compliance. **(CCNJ)**	The first paragraph states that the concentration in ground water used to develop a MGWSRS (through application of the soil-water partition equation) was previously the health based Ground water Quality Criterion, which does not take the PQL into account. In the adopted standards, the concentration in ground water used to develop a MGWSRS is the GWQS which takes PQL into account. The Department does not follow the logic that this statement indicates post-remedial soil sampling is the mandatory "end-point" for the migration to groundwater aspect of an environmental investigation. Nevertheless, soil sampling is likely to be required to demonstrate that the concentrations remaining in soil do not have the potential to impact ground water in the future. The options in this guidance document indicate what is necessary to demonstrate this in each case. The MGWSRS are soil concentrations, and ground water monitoring (an activity carried out in present time) is not a substitute for soil concentrations. The soil standards, site-specific, or MGWSRS, or narrative standards, define the end point of an investigation. .