New Jersey Department of Environmental Protection
Site Remediation and Waste Management Program

INSTRUCTIONS FOR THE CLASSIFICATION EXCEPTION AREA / WELL RESTRICTION AREA (CEA/WRA) FACT SHEET FORM

General Instructions

1. **Applicability.** Use the above referenced form as directed below to propose a new Classification Exception Area/Well Restriction Area (CEA/WRA), revise or reestablish an existing CEA/WRA and, except as precluded below, request a CEA/WRA be removed (i.e., lifted). The Administrative Requirements for Remediation of Contaminated Sites, at N.J.A.C. 7:26C-7.3, lists the requirements for establishing and removing a CEA/WRA for ground water contamination delineated per N.J.A.C. 7:26E-4.3 of the Technical Requirements for Site Remediation (Technical Rules).

   This form, the Cover/Certification Form if applicable, and all supporting documentation are referred to as the CEA package in these instructions. Supporting documentation includes Exhibits A, B and C and a CEA contaminant fate and transport description; it also includes supporting data and other information in either the Remedial Investigation Report or the Remedial Action Report.

   Note: A CEA cannot be "lifted" or "revised" until it is already "established," however, additional information on "CEA Package Withdrawal or Modification" is provided below.

   New or Existing CEA

   Remedial Investigation Reports (RIRs) - A CEA package is required to be submitted as part of the RIR to establish a new CEA. RIRs must be submitted through the NJDEP Online Services; this form and Exhibits A and B can be submitted as part of the online service **or** as a separate package as indicated in item 4 below. Exhibit C: GIS deliverable submittal instructions are also explained in item 4 and Section B below. A CEA contaminant fate and transport description section must be included within the body of the RIR. After reviewing all instructions, contact the Bureau of Ground Water Pollution Abatement (BGWPA) at 609-292-8427 with any questions.

   Ground Water Remedial Action Permit (RAP) Applications - The CEA package is required to be submitted as part of a Ground Water RAP Application, even if the CEA was previously established and regardless of whether it needs to be revised. The initial RAP application, when necessary, is a required part of a Remedial Action Report (RAR); the RAR and RAP application should be submitted simultaneously but the RAR must be submitted via the NJDEP Online Service. This form and Exhibits A and B can be submitted using the Remedial Action Report Online Service **or** as a separate package as indicated in item 4 below. Exhibit C: GIS deliverable submittal instructions are explained in item 4 and Section B below. A CEA contaminant fate and transport description must be updated and should be included in the text of the RAR. After reviewing all instructions, contact the Bureau of Remedial Action Permitting at 609-984-2990 with any questions about any CEA package submitted with a RAP application.

   CEA Revision Prior to Submitting a Ground Water RAP Application – If a CEA has already been established, a CEA revision can be proposed prior to submittal of the Ground Water RAP Application by submitting this form and all supporting documentation. In this situation, the documentation must include the RIR, Exhibits A through C, as relevant to the revision, and, if an updated CEA contaminant fate and transport description is not already in the RIR and is relevant to the revision, submit an attachment containing the required description. A copy of the CEA package, including the RIR but excluding Exhibit C, should be submitted on a CD. Contact the BGWPA at 609-292-8427 with any questions and regarding whether any of the supporting documentation is not relevant; also see Exhibit C: GIS Deliverable instructions below if applicable.

   Reestablishing an Existing CEA – The NJDEP establishes a CEA/WRA by posting the CEA map on NJ-GeoWeb under the SRP Profile at http://www.nj.gov/dep/gis/geowebsplash.htm and posting the CEA/WRA Fact Sheet, which can be found using NJDEP Data Miner at: http://www.nj.gov/dep/opra/online.html. If a CEA was established prior to January 1, 2013, but is not yet posted on **both** these NJDEP websites, the CEA needs to be reestablished in order to adequately complete all documentation. For **any** existing CEA it is prudent to complete the following tasks:

   - Determine if the CEA is mapped on the NJ-GeoWeb CEA layer and if the boundaries are correct. If the CEA is not mapped or the boundary is incorrect, update the GIS deliverable as needed. See detailed Exhibit C instructions below regarding electronic submittal of the GIS deliverable.

- If the CEA/WRA Fact Sheet cannot be found using NJDEP Data Miner, confirm that the correct Program Interest ID was entered in the NJDEP Data Miner search and/or search by site name to determine if multiple PI IDs have been assigned at the site. If there is definitely no CEA/WRA Fact Sheet posted, or the CEA data is missing or incorrect in the fact sheet available through Data Miner, submit an updated CEA/WRA Fact Sheet Form (aka CEA form) and Exhibits A and B so the Department can reestablish the CEA and update the data. Attaching a copy of the existing CEA/WRA Fact Sheet most recently issued by the NJDEP for the established CEA, and/or NJDEP correspondence documenting when the CEA was established, or last revised, can expedite updates to the Department's CEA data.

Contact the applicable NJDEP Bureau listed above, based on whether a RAP has been issued or not, for additional information regarding any existing CEA that should be reestablished and/or revised as discussed above.

CEA Package Withdrawal or Modification (Prior to Submitting a Ground Water RAP Application)

As indicated above, a CEA package submitted with only a RIR will be reviewed by the BGWPA. Prior to when a CEA is established by BGWPA, a request to withdraw such a CEA package should be submitted directly to the BGWPA. The withdrawal request should be submitted without a new form but will only be considered if an adequate amount of ground water data now indicate that all site related ground water contaminants are at or below all applicable ground water remediation standards throughout the entire contaminant plume, which includes any off-site areas. Use NJDEP Data Miner to determine: whether a CEA package is under review by BGWPA; who it is assigned to in the bureau; or whether a CEA has already been established. To request a CEA package be withdrawn, or to submit a modification to one, contact BGWPA by email or phone. Adequate supporting documentation for a withdrawal or modification should be submitted to BGWPA via email; withdrawal documentation should be consistent with that described below for a CEA removal.

CEA Removal (i.e., Lifting)

For sites with a Ground Water RAP – If you are requesting removal of a CEA for one of these sites, **do not** submit this form. Submit a Ground Water RAP Application requesting termination of the permit pursuant to N.J.A.C. 7:26C-7.13 after complying with N.J.A.C. 7:26C-7.9(f).

For conditional NFA sites without a Ground Water RAP – For sites where the NJDEP issued a conditional No Further Action (NFA) letter *and* the NJDEP has not yet issued a Ground Water RAP, if you are requesting a CEA be lifted, submit this form and applicable supporting documentation along with the Remedial Action Protectiveness/Biennial Certification Form – Ground Water.

- Pursuant to N.J.A.C. 7:26C-7.6(a), the deadline for submitting an application to obtain a Ground Water RAP was May 7, 2014 for conditional NFA sites, thus, if the CEA could not have been lifted by that date, the Ground Water RAP Application with the Remedial Action Protectiveness/Biennial Certification Form – Ground Water should have been submitted.

For all other sites without a Ground Water RAP - For these sites, this form along with supporting documentation can be submitted by itself to request a CEA be lifted at any time prior to when the RAP is issued.

Supporting documentation for CEA removal must include data showing that concentrations of all site related ground water contaminants are at or below all applicable remediation standards throughout the entire CEA. This data must have been collected consistent with the conditions specified at N.J.A.C. 7:26C-7.9(f) and N.J.A.C. 7:26E-5. If a CEA lift is requested before a RAP is issued, the site will still be evaluated in light of these requirements and Monitored Natural Attenuation (MNA) guidance and/or guidance relevant to active remedial actions and performance monitoring.

Courtesy copies of the rules cited above are available at http://www.nj.gov/dep/srp/regs/. If the CEA is associated with a MNA remedy, please review the MNA Technical Guidance at http://www.nj.gov/dep/srp/guidance/index.html.

2. **Form Updates.** The NJDEP may update this form periodically. Please ensure you are using the latest version of this form. Download the latest versions from the NJDEP Website at http://www.nj.gov/dep/srp/srra/forms.

3. **Signature.** Except as noted below, this form must be submitted with a completed Cover/Certification Form signed by the person responsible for conducting the remediation and the Licensed Site Remediation Professional (LSRP).

   Note: If this form is being uploaded through a Remedial Phase Online Service, the Cover/Certification form is not required. The certification for this form is covered by the "Authorization to Submit Remedial Investigation Report Through NJDEP Online Form".

4. **Submittal Requirements:** NJDEP Online is available at http://www.nj.gov/dep/online. Exhibit C is to be submitted **only** to the GIS email address; see detailed instructions in Section B.5. below. If not submitted using a Remedial

Phase Report Online Service, the completed form should be placed on top of Exhibits A and B and sent, with the Cover/Certification Form, and any other supporting documentation not in the RIR or RAR, to the below address in paper form and on a CD in Adobe Portable Document Format (PDF):

Bureau of Case Assignment & Initial Notice
Site Remediation Program
NJ Department of Environmental Protection
401-05H
PO Box 420
Trenton, NJ 08625-0420

It is **not** required to submit paper copies of this form in duplicate. If not using the online service for the CEA documents, submit the entire CEA package within 14 days of the online submission of the remedial phase documents.

Note: Draft CEA packages are not accepted by the Bureau of Case Assignment & Initial Notice (BCAIN).

Section A. Site Information

- **Site Name:** Provide the name of the site (i.e., ABC Corporation);
- **Program Interest (PI) Numbers:** The PI Number is assigned by the NJDEP and can be obtained via the web at http://www.nj.gov/dep/srp/ (DEP DATA MINER REPORTS).
- **Case Tracking Numbers for this submission:** Provide all NJDEP generated site identification numbers for this submission (Hotline incident numbers, UST Notice of Intent to Close numbers, ISRA numbers, etc.). Attach additional sheets if necessary. If this form is being submitted with an application for a Ground Water Remedial Action Permit Modification, Transfer or Termination, include your permit number.

Current NJDEP policy is usually to establish one CEA for each distinct plume and discharge area regardless of whether the plume migrates off site and/or whether an active remedy is used for part of the plume and MNA for the remainder of the plume.

1. Indicate if the form is for a new CEA, a revised CEA, to reestablish an existing CEA, for an existing CEA with no changes, a CEA for historic fill, a CEA for historically applied pesticides, or a proposal for lifting/removal of a CEA. For sites **not** under traditional NJDEP oversight, if a CEA package was submitted prior to May 7, 2012, but the CEA has not yet been established, a new CEA proposal is required. In that situation check the "New CEA" box even though the CEA documentation was previously submitted. A separate form should always be submitted for a historic fill or historically applied pesticides CEA even if a CEA is also needed for site contaminants of concern. See item 1 of **General Instructions** regarding reestablishing or lifting a CEA and also for how to address CEA package withdrawal/modification before the CEA is established. If you are submitting this form for an existing CEA (i.e., already established), provide the CEA Subject Item ID. The CEA Subject Item ID is assigned when the NJDEP establishes the CEA. If there are multiple CEAs at a site, each one will have a unique Subject Item ID. This ID can be found on the CEA Fact Sheet issued by the NJDEP, which is available at the Data Miner web page https://www13.state.nj.us/DataMiner.

2. Indicate the type of approved ground water remedial action (RA) or if a final RA was not yet selected. Consistent with N.J.A.C. 7:26E-5.1(e) (http://www.nj.gov/dep/rules/rules/njac7_26e.pdf), do not check "Natural" if free or residual product is present. Per N.J.A.C. 7:26E-2.1(a)14, free product or residual product is considered to be present in any environmental media using direct observation, enhanced field observation methods, field instrumentation measurements, or laboratory analytical data. As indicated in the Technical Rules, for contaminants that are in their pure phase and are at standard state conditions (20 degrees Celsius to 25 degrees Celsius and one atmosphere pressure), and that have densities greater than water, free or residual product shall be considered to be present if the contaminant is detected in ground water at concentrations equal to or greater than one percent of the water solubility of the contaminant, if ground water contains only that organic contaminant; or if a mixture of such contaminants is present, then the effective water solubility of the contaminant shall be estimated for this determination. The definition and how to estimate effective solubility is at N.J.A.C. 7:26E-1.8, which states:

   > "Effective water solubility" means the theoretical aqueous solubility of an organic constituent in ground water that is in chemical equilibrium with a separate phase mixed product (product containing several organic chemicals). The effective water solubility of a particular organic chemical can be estimated by multiplying its mole fraction in the product mixture by its pure phase solubility.

   Detailed discussion of effective solubility may be found in the NJDEP Site Remediation Program Ground Water Technical Guidance. Additionally, the water solubility for many compounds may be found on the Department's Chemical Properties Table on the Remediation Standards webpage at http://www.nj.gov/dep/srp/guidance/rs/chemproperties.pdf. US EPA also has an on-line tool at https://www3.epa.gov/ceampubl/learn2model/part-two/onsite/es-temperature.html which calculates effective solubility

for fuels. Use of pure phase water solubility is appropriate when determining the effective water solubility is not practicable. The Department considers product to be present based on an EPH of 8,000 mg/kg for Category 1 fuels and 17,000 mg/kg for category 2 mixtures in soil, sediment or sludge matrices. This information on EPH for Category 1 and Category 2 mixtures is available at http://www.nj.gov/dep/srp/guidance/srra/eph_protocol.pdf.

3. Check "Yes" if the CEA is being submitted with any of the following RAP Forms: a RAP Application for Soil; a RAP Application for Ground Water, and a RAP Transfer/Change of Ownership Application.

   Note: A Ground Water RAP is not required for historic fill or historically applied pesticides CEAs, but a deed notice and Soil RAP is needed for historic fill on the site if historic fill related contaminants are detected above applicable soil standards.

Section B. CEA Component and Vapor Intrusion Information

CEA guidance at http://www.nj.gov/dep/srp/guidance/cea/cea_guide.htm provides some information on how to describe CEA components (i.e., contaminants, boundaries and longevity) and limited guidance regarding fate and transport modeling, however, this guidance has not been updated since 1998. Consequently, it does not take into account that the initial CEA proposal is now to be submitted with the RIR; this change in submittal timing could impact appropriate modeling assumptions, input parameters, and the calculation of projected CEA duration and extent. Except for historic fill and historically applied pesticides CEAs, a CEA contaminant fate and transport description must be submitted even if a CEAs duration is indeterminate.

Submit the fate and transport description required by N.J.A.C. 7:26C-7.3(b)2 as a section within the RIR pursuant to N.J.A.C. 7:26E-4.3(a)6 and 7 and 4.9(a). Submit an equivalent, updated fate and transport description, within the RAR and RAP application, pursuant to N.J.A.C. 7:26E-5.7(a) and N.J.A.C. 7:26C-7.5(c) or (d). Indicate on the form which document includes the most recent description and the date of the document. Additional information and requirements related to the various CEA components and the contaminant fate and transport description is provided below pending updates to the CEA guidance. Consistent with the vapor intrusion (VI) related requirements of N.J.A.C. 7:26C-7.3(b)2, supply the indicated information in both items 2 and 3 of Section B of the form and include in the fate and transport description the explanation discussed in item 3 below regarding the VI related check boxes.

1. **Ground Water Classification:** Indicate the classification of ground water within the CEA based on the Ground Water Quality Standards (GWQS) at N.J.A.C. 7:9C-1.5; the current GWQS rules are available at http://www.state.nj.us/dep/wms/bears/gwqs.htm. The classifications currently available for use are: Class I-PL (Pinelands Protection Area); Class I-PL (Pinelands Preservation Area); Class I-A; Class II-A; Class III-A; and Class III-B. Note that there are currently no Class II-B areas established and per N.J.A.C. 7:9C-1.5(e) and 1.10, Class II-B areas must be established through rulemaking.

   Demonstrating to the Department the existence of Class III areas is not subject to the rule making process of N.J.A.C. 7:9C-1.10, "Procedures for reclassification of ground water." The descriptive criteria, at N.J.A.C. 7:9C-1.5(f), for Class III-A and III-B classification areas must be used to demonstrate whether impacted ground water at a site is within a Class III area. Contact the BGWPA (number listed above) for more information on Class III area determinations.

2. **Contaminant Data:** The form's data table is required by N.J.A.C. 7:26C-7.3(b)1. In the first column of the table list all ground water contaminants that exceed their applicable standard in, or based on, the applicable section of the GWQS rules. If a historic fill CEA is being proposed per N.J.A.C. 7:26E-4.7(b)1 or 2ii [i.e., ground water contamination is assumed to exist per N.J.A.C. 7:26E-3.12(b)1], use the phrase "historic fill related contaminants" on the table. No entry is required in the remaining columns if contamination is assumed for historic fill.

   Fill in the second column of the table with maximum contaminant concentrations and as indicated in the instructions immediately preceding the table and the foot notes below it. Preferentially report in this column the most recent 24 months of ground water data but older data should also be included here if it could still be representative of maximum values under current site conditions. Note that the contaminant concentration values listed in this table may or may not be appropriate for use in contaminant fate and transport estimates of CEA duration, depending on the situation.

   To complete the GWQS column for Class II ground water classification areas use the numeric values available under the heading Ground Water Quality Criteria (GWQC), PQLs (practical quantitation levels) and Constituent Standards for Class II Ground Water at http://www.state.nj.us/dep/wms/bears/gwqs.htm.

   To complete the GWQS column for Class I-PL areas refer to N.J.A.C. 7:9C-1.7(b) of the GWQS. Pursuant to N.J.A.C. 7:9C-1.9(c), the PQL values listed in the Class II table at the above link should be used for constituents that are not naturally occurring. As indicated by the definitions of "Natural quality" and "Background water quality" at N.J.A.C. 7:9C-1.4 of the GWQS, a data set that is large enough for applicable statistical analyses should be used to determine natural or background water quality in Pinelands Class I-PL ground water classification areas.

To complete the GWQS column for Class III-A or III-B ground water classification areas, GWQC must be determined based on N.J.A.C. 7:9C-1.7(e) or (f), respectively and as applicable. If Class III GWQC can be based solely on the narrative standard quoted below from N.J.A.C. 7:9C-1.7(e)**3** or N.J.A.C. 7:9C-1.7(f)**3**, it is appropriate to use the generic NJDEP vapor intrusion (VI) ground water screening levels (GWSL) or alternative (i.e., site specific) screening levels as the Class III GWQC, and thus to define CEA boundaries or determine if a CEA is needed:

> "3. Release of pollutants to the ground surface, structures or air in concentrations that pose a threat to human health;… ."

Current vapor intrusion (VI) screening levels are available at http://www.nj.gov/dep/srp/guidance/vaporintrusion/.

Class III GWQC may need to be based on either N.J.A.C. 7:9C-1.7(e)**2** or N.J.A.C. 7:9C-1.7(f)**2** of the GWQS, as applicable, in Class III areas where ground water contamination discharging into a surface water body results in a violation of the Surface Water Quality Standards (SWQS). Pursuant to N.J.A.C. 7:9B- 1.14(d) of the SWQS (see pg. 28 at http://www.nj.gov/dep/rules/rules/njac7_9b.pdf) all surface water classifications have a General Surface Water Quality Criteria (SWQC) for "petroleum hydrocarbons and other oils and grease" of "None noticeable in the water or deposited along the shore or on the aquatic substrata in quantities detrimental to the natural biota." Based on this SWQC, N.J.A.C. 7:9C-1.2 of the GWQS, and the above cited Class III GWQS requirements, the Department would set the Class III GWQC for this parameters at none noticeable where free or residual product is in, or could migrate into, a surface water body. In this situation "none noticeable" should be entered into both the GWQS and SWQS columns of the data table.

Where the SWQS column is applicable (see Note 3 in the form table), values for SWQS for many contaminants are available at the link in the above paragraph.

For the VI GWSL column, the Vapor Intrusion Pathway website at http://www.nj.gov/dep/srp/guidance/vaporintrusion/ can be used to access links to "Vapor Intrusion Screening Levels," which lists the generic levels, and "Update to VI Screening Levels" for guidance on site-specific options that can be used to develop alternative (i.e., site-specific) screening levels (see page 8 of the document at that link).

If this table is not large enough to include all contaminants, check the box below the foot notes and use the Addendum to the form to list the additional contaminants and associated data. To minimize possible errors, please fill in all rows in the Section B table before using the Addendum for the CEA form.

3. **CEA Boundaries and VI Pathway Status:** Consistent with N.J.A.C. 7:26C-7.3(b)2, (b)3 and (c), provide the following information. Enter year of tax map. Indicate whether the CEA includes any volatile contaminants and whether it currently includes any light non-aqueous phase liquid (LNAPL). If revising a CEA, check the appropriate box if the CEA boundary or the blocks and/or lots have changed since the CEA was established.

   Fill in the table within the form. If this table is not large enough to include all properties included within the CEA, check the box below the table and use the Addendum to the form to list additional blocks and lots. Only one block should be listed per row of the table. Multiple lots in a block can be listed on one row of the table if all the lots in that row have the same status with regard to the columns with check boxes.

   Use the check boxes in the third column from the left within the table to indicate which blocks/lots are located off-site.

   If the CEA includes volatile contaminants, use the fourth column to document whether the VI pathway was "evaluated" for each listed block and lot (i.e., parcel). Use the last column to document whether an "indeterminate" VI pathway status exists on any parcel overlying the CEA.

   For any CEA that includes volatile contaminants, the CEA contaminant fate and transport description must address the vapor intrusion pathway which includes explanations regarding any parcel where the VI pathway was not evaluated and/or any parcel where the VI pathway status is indeterminate.

   Note: Regarding the fourth column, the VI Technical (VIT) Guidance indicates that evaluating VI impacts can include a determination that there is no VI risk due to the presence of a clean water lens or because shallow ground water is contaminated but at concentrations below the VI GWSL. Regarding the last column, see section 3.5.2 of the VIT Guidance, January 2018, Version 4.1, for a discussion of "Indeterminate VI Pathway status." Generic VI GWSL are at http://www.nj.gov/dep/srp/guidance/vaporintrusion/. The VI pathway is discussed in more detail below under "**Additional Fate and Transport Description Information**."

   Direction of ground water flow:

Consistent with N.J.A.C. 7:26E-4.3(a)1, insert the predominant direction of groundwater flow. If the flow direction is variable (i.e., no predominant direction) or radial, insert the more appropriate of those terms on the CEA form. If the CEA includes multiple distinct water bearing zones with different flow directions, enter "multiple zones/variable" on the form, and, consistent with N.J.A.C. 7:26E-1.6(b)8iii and 4.3(a)1, indicate which figures in the RIR or RAR depict flow direction in the different zones/aquifers. If there are multiple zones/aquifers but the predominant flow direction is the same in **all** zones, enter "multiple zones/…" followed by the predominant flow direction.

Vertical depth and horizontal extent of CEA:
Provide the vertical depth of the CEA in feet below ground surface **and** mean sea level. If the CEA is within multiple geologic formations/units provide the thickness, in feet, of the vertical interval of the CEA within each formation; place these values in parenthesis after the names of each affected geologic formation/unit listed on the form.

Provide the horizontal extent of the CEA in acres **or** square feet and indicate the units used.

Name(s) of the affected geologic formation(s)/unit(s):
Include only the name(s) of the formation(s)/unit(s) known to be and projected to be affected or for historic fill, assumed to be affected. If applicable and as indicated above, if the CEA is in more than one formation/unit include the thickness in feet of the CEA within each one.

The interactive mapping application NJ-GeoWeb at http://www.nj.gov/dep/gis/newmapping.htm, can be used to obtain names and distribution information for geologic formations or units (GIS Layers: Surficial Geology and Bedrock Geology). More detailed digital "Geodata" and published maps are available through the NJ Geologic Survey web site http://www.nj.gov/dep/njgs/. **Note**: Aquifer names and distribution differ from those of geologic formations but aquifer information can also be obtained from these sources.

Narrative description of proposed CEA boundaries:
Identify roads, streams, and other natural and manmade borders that can be used to describe the CEA boundaries. Indicate whether the plume is expected to remain on site or migrate off site, whether the site property boundaries are being used to define the CEA extent, and/or whether regional historic fill is known or assumed to be responsible for the contamination per N.J.A.C. 7:26E-3.12(b). If the CEA extends off site, please indicate the distance it extends off site from the site property boundary. Indicate whether the CEA is horizontally and vertically delineated based only on actual data or whether fate and transport projections were used, and/or if the footprint of the property is being used to define the boundaries per N.J.A.C. 7:26E-4.7(b)1 or 2ii. Do not repeat information entered elsewhere on the form.

4. **Projected Term of CEA:** Required by N.J.A.C. 7:26C-7.3(b)4. Based on the modeling/calculations documented in the fate and transport description in the RIR or RAR, provide the projected duration of the CEA in years and the expected expiration date. The duration can be "indeterminate" for: metals, historic fill, or historically applied pesticides CEA; when the CEA is proposed prior to source remediation; or for active remedial actions. For these situations check the "Indeterminate" box instead of providing a proposed duration and expected expiration date. Indeterminate **may** also be appropriate when the CEA is proposed prior to collection of a ground water data set sufficient for predicting a duration; consult the Bureau of Ground Water Pollution Abatement prior to checking Indeterminate in that situation.

   Additional Fate and Transport Description Information: Pursuant to N.J.A.C. 7:26C-7.3(b)2 the fate and transport description is required to summarize/describe all data, assumptions, information, software and interpretations used to evaluate plume fate and transport and must also include information to document: that degradation products were addressed appropriately; how horizontal and vertical extent predictions were performed; how the CEA duration was projected; that the vapor intrusion (VI) pathway was included in the fate and transport description, if applicable; and that a site specific evaluation was conducted on how changes in property use or conditions above the CEA could affect the fate and transport of ground water contamination or vapors emanating from the plume.

   If the ground water use documentation reported in Section C of this form indicates pumping wells exist near the CEA, the fate and transport description should address possible impacts of any likely changes in the use (i.e., status) of these wells, whether/how such changes could affect the CEA contaminants or cause the wells to be impacted by the contaminants, and the likelihood that new pumping wells will be installed in close proximity to the CEA. **Note**: Prior to a Ground Water RAP being issued, N.J.A.C. 7:26E-1.14(a)3 requires an updated well search every two years which may trigger an updated receptor evaluation if any new wells are identified. After a Ground Water RAP is issued the biennial remedial action protectiveness evaluation, at N.J.A.C. 7:26C-7.9, requires evaluation of changes in ground water use and whether such changes affect the protectiveness of the remedial action which could trigger "re-modelling the fate and transport of the ground water contaminant plume… "

Until NJDEP CEA guidance is updated the Department is providing the following links to, and relevant information from, NJDEP guidance and other information sources relative to the fate and transport description, model input values, and modelling methods applicable to estimating CEA boundaries and/or duration.

VI risk related information relevant to the fate and transport of volatile organic compounds (VOCs) is available in the SRP 2011 Technical Guidance for Preparation and Submission of a Conceptual Site Model (CSM guidance) and the SRWMP 2018 Vapor Intrusion Technical (VIT) Guidance (both available at http://www.nj.gov/dep/srp/guidance/). In the 2011 CSM guidance see: section 5.2.5.5 (page 18); the References (page 24) Carr 2011 and Rivett 1995; the statement in the Exposure Assessment section of Appendix B (page 33) which indicates the importance of evaluating "human activity and anticipated land use" at a site; and Example B2 of Appendix B (page 36) which focuses on risk posed by VOCs that degrade slowly in the subsurface, or "recalcitrant VOCs." Section 6.4.1 of the 2018 VIT Guidance discusses examples of changes in property use and conditions that could affect the fate and transport of vapors emanating from the plume; this section includes the following examples: conversions to residential use; building renovation or major alterations to HVAC system construction or operation; new construction (i.e., on undeveloped property); changes in ground surface cover or storm water management; and filling and/or excavation operations. As indicated above the fate and transport description should refer to the information provided by the check boxes in Section B, item 3 of this form and explain whether the VI pathway was evaluated or not at any property overlying a CEA that includes volatile contaminants and why an "Indeterminate VI Pathway status" exists on any of these properties (see section 3.5.2 of the 2018 VIT Guidance).

A comprehensive summary of chemical properties and half-lives is available at http://www.gsi-net.com/en/publications/gsi-chemical-database.html or in the Handbook of Environmental Degradation Rates (Howard, et.al). Soil organic carbon-water partition coefficient (K_{oc}) values are available in the Department's Chemical Properties Table on the Remediation Standards webpage at http://www.nj.gov/dep/srp/guidance/rs/chemproperties.pdf.

Appendix C of the 2014 SESOIL/AT123D Soil Remediation Standards guidance document (page 33, at http://www.nj.gov/dep/srp/guidance/rs/at123d_guidance.pdf) explains why the USEPA Lloyd Kahn Method (described at http://www.state.nj.us/dep/srp/guidance/rs/lloydkahn.pdf) is preferred by the Department for determination of total organic carbon (foc) in sediment. Note that the default f_{oc} value referenced in NJDEP Soil Remediation Standards guidance for determining **soil** standards (i.e., 0.002) is for the unsaturated zone **not** the saturated zone; it is the **saturated** zone that is modelled to project CEA extent and/or duration.

Appendix D of the 2012 NJDEP MNA Technical Guidance, part "4. Organic Carbon Content" states that typical f_{oc} literature values range between 0.0002 - 0.02 and that if f_{oc} is "unknown, a default value of 0.001 (0.10 percent) is often used (e.g., ASTM, 1995)." Note that 0.001 is of the same order of magnitude as the value used for **unsaturated** soils, discussed in the paragraph above. Also note that this statement includes no indication of Department preference for use of this value; it states only that the value is "often used." The reference cited for this statement is the ASTM 1995, *Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites*. The 1998 NJDEP CEA guidance (Appendix A, pg. 14 at http://www.nj.gov/dep/srp/guidance/cea/cea_guide.htm) provides the Department's order of preference regarding information/data sources for CEA delineation/modeling which is "as follows: site-specific data; data from nearby sites; regional studies (the New Jersey Geological Survey is a good source of regional **ground water** information); and literature values" (emphasis added). This same "order of preference for sources of information" is repeated in the Literature Review section, 3.1.3.3, of the 2012 Ground Water Technical Guidance (page 17 at http://www.nj.gov/dep/srp/guidance/srra/gw_inv_si_ri_ra.pdf).

The section on **Longevity** and APPENDIX A in the NJDEP CEA guidance document both include information relevant to evaluating and describing plume fate and transport. Please consider all the indicated and/or appropriate modeling assumptions for the **ANALYTICAL SOLUTION OPTION** discussed in APPENDIX A of the CEA guidance document (pages 15-23). The "**Initial Concentration:**" section in the CEA guidance (pages 16-17) discusses information to consider before choosing the ground water concentration data most appropriate for modeling site conditions.

The USEPA Ground Water Issue paper, "Calculation and Use of First-Order Rate Constants for Monitored Natural Attenuation Studies," EPA/540/S-02/500, November 2002, (C.J. Newell, et al) also includes information that can be applied to determining CEA duration and extent. The paper is available via a search at https://www.epa.gov/nscep. .

Several free public domain fate and transport ground water models are available from the USEPA at http://www2.epa.gov/land-research/models-tools-and-databases-land-and-waste-management-research. Ground water models listed under the Models tab include BIOCHLOR, which is for dissolved chlorinated solvents, and BIOPLUME II, BIOPLUME III and BIOSCREEN, which are for dissolved hydrocarbons from petroleum fuel releases. The web pages for each model, available through the above link, each contain links to user's manuals, downloading instructions for the model programs and contact information for USEPA modelling experts in the Ground Water and

Ecosystems Restoration Division (GWERD) of the National Risk Management Research Laboratory housed at the Kerr Center in Ada, OK.

5. **Exhibits A through C:** Attach and/or submit all Exhibits as indicated below and/or in the Instructions for the NJDEP Remedial Phase Online Service.

   Exhibit A: Site Location Map - Consistent with N.J.A.C. 7:26E-1.6(b)8, submit a copy of the portion of a USGS 7.5-minute quadrangle map that includes the proposed CEA. Please submit paper and PDF copies with the form and on a single CD if not using the online service.

   Exhibit B: CEA Map (excluding GIS compatible format) and Cross Section - Required by N.J.A.C. 7:26C-7.3(c)1 and (c)2. Paper and PDF copies of the map(s) and cross-section figure must be submitted with the form and on a single CD unless using the online service. (See Exhibit C instructions below for GIS compatible format map (GIS deliverable).)

   CEA Map – The CEA map should include all the items listed:

   - Known and predicted extent of the most mobile and persistent ground water contaminant(s)
   - Prevailing ground water flow direction
   - Proposed CEA boundary
   - Locations and IDs of wells/sampling points required to comply with N.J.A.C. 7:26E-1.6 and 4.3 or 5.2(a)
   - Identification of wells/sampling points that are the most representative of:
     - the farthest down gradient extent of the contamination
     - the greatest width of the contamination
     - the highest levels of ground water contamination
   - Location of all area(s) of concern that caused the ground water contamination (i.e., source-areas). This includes the extent of free and residual product delineated per N.J.A.C. 7:26E-4.3(a)3.
   - Location(s) and ID of down gradient well(s) closest to that/those area(s) of concern indicated above
   - Location of any structures or buildings.

   Cross-Section – The cross-section figure should be along the prevailing ground water flow direction and define the approximate ground water contaminant plume centerline. Include a vertical and horizontal scale (e.g., inches per foot); the vertical axis should be elevation in relation to mean sea level. The figure should include identification of:

   - Location/ID of all wells and borings used to draw the cross-section (include ground surface and/or top of well casing elevations)
   - Generalized location of the water table
   - Generalized hydrostratigraphy (if the proposed new CEA or revision is in multiple formations, identify formation boundaries and names)
   - Known and predicted extent of the contaminant plume
   - Proposed CEA boundaries (including upper and lower)

   Exhibit C: GIS Deliverable/CEA Boundary Extent Map - Submit the CEA Boundary Extent Map via email as a GIS deliverable pursuant to N.J.A.C. 7:26C-7.3(c)1, in accordance with the requirements below and GIS guidance found at http://www.nj.gov/dep/srp/gis.

   Indicate whether a “Shape File” or a “CAD File” will be/was sent or check N/A if the answer to the question below this item is no. Submittal of the GIS deliverable via email is required for a new CEA, revisions to an existing CEA where the boundary has changed, and to reestablish any existing CEA established prior to January 1, 2013, that is not already posted on NJ-GeoWeb.

   For the last item, check “Yes” on the form if the file to be sent differs from the version on NJ-GeoWeb at http://www.nj.gov/dep/gis/geowebsplash.htm. For an existing CEA with no boundary changes, please confirm whether the CEA boundary has been mapped in NJ-GeoWeb and then whether the CEA boundary is correctly depicted in NJ-GeoWeb. If both these conditions are met (i.e., the CEA has been mapped and correctly depicted in NJ-GeoWeb), a GIS deliverable does not need to be submitted; in that situation answer No on the form. Check N/A for a new CEA or any CEA that needs to be reestablished because it was not already mapped in NJ-GeoWeb.

   GIS Deliverable submittal requirements:

   - ESRI ArcMap users are advised that “mdb” (geodatabase) files are no longer accepted via email for security reasons. Attach GIS polygon shape files instead. Shape files need to include the following file extensions: .shp; .shx; .dbf; and .prj.

- Computer-aided Design (CAD) software users must submit DWG files defined in "model space" NAD 83 State Plane Coordinate feet. The CEA boundary should be mapped as a DWG **Polygon** and the record(s) that depict the extent of the CEA boundary must be named "CEA_Boundary" in the Layer field. Do not name annotation, graphics or any other map element in this way.
- Send GIS deliverables **by email only** to srpgis_cea@dep.nj.gov (do not include CAD or shape files on the CD submitted with the form).
- Please refer to http://www.nj.gov/dep/srp/gis/minimum_accuracy_requirements_for_srp_gis.pdf for the Minimum Accuracy Requirements for SRP GIS Submissions.
- In the body of the email that includes the GIS deliverable, include the CEA information as described in the Administrative Requirements for GIS Deliverables found at http://www.state.nj.us/dep/srp/gis/adminstrative_requirements_for_gis_deliverables.pdf.
- GIS questions/comments should be directed to srpgis@dep.nj.gov.

SECTION C. Current Ground Water Use Documentation

Well Search Results – Required by N.J.A.C. 7:26E-1.14 and 4.9(a)2 or 5.7(b)2. A well search should have been conducted pursuant to N.J.A.C. 7:26E-1.14(a) and the results submitted in the RIR or RAR and as a GIS deliverable (see Receptor Evaluation Form Instructions at http://www.nj.gov/dep/srp/srra/forms/ and Well Search E-Tools at http://www.nj.gov/dep/srp/gis). The well search also applies to historic fill or historically applied pesticides ground water contamination.

1. Indicate the year of the most recent well search completed per N.J.A.C. 7:26E-1.14.
2. If the CEA Form is for a revised CEA or an existing CEA with no changes, please indicate whether new wells have been installed since the CEA was established. If this form is **not** for a revised CEA or an existing CEA, check "NA" for this question. **Note:** Pursuant to N.J.A.C. 7:26E-1.14(a)3, the well search must be updated every two years and any new wells must be identified.
3. Indicate whether or not there are any pumping wells within the foot print of the CEA such as potable, industrial, irrigation or recovery wells. If there are such pumping wells, list or attach a list of the type(s) and the status of each well (i.e., active, inactive, or properly decommissioned). The CEA contaminant fate and transport description should address if and how any such pumping wells could affect or could be affected by the CEA contaminants. If potable wells are present, the well restrictions listed below are applicable.

Online reports and well search information are available at http://www.nj.gov/dep/watersupply/pw_permit.html. Questions regarding these reports/well searches should go to the Well Permitting Section of the Bureau of Water Allocation and Well Permitting at (609) 984-6831. Questions regarding Receptor Evaluation requirements of the Technical Rules should be directed to the current SRP Contact person for that topic at: http://www.nj.gov/dep/srp/srra/srra_contacts.htm.

SECTION D. Well Restriction Information

Required by N.J.A.C. 7:26C-7.9(a)4 and the GWQS at N.J.A.C. 7:9C-1.6(d). For Class I and II-A ground water and pursuant to the GWQS at N.J.A.C. 7:9C-1.6(d), where ground water quality data indicate contaminants exceed or will exceed the values referenced in the State Primary Drinking Water Regulations, N.J.A.C. 7:10- 5, the NJDEP shall restrict, or require the restriction of, potable ground water uses within any CEA. Therefore, where these standards are exceeded any CEA within a Class I or II-A area is also a Well Restriction Area with regard to potable ground water use, the extent of which generally coincides with the boundaries of the CEA (there are occasional differences in Class I areas). Certain well restrictions, such as "Double Case Wells", "Sample Potable Wells", and "Evaluate Production Wells", are consistently set within the boundaries of all WRAs established by the NJDEP in Class I and II-A areas. Well restrictions may be applied in Class III areas where: ground water contaminants in any Class III classification area are expected to migrate into a Class I or II-A area; potable wells are drilled through CEAs in any Class III area; or an existing ground water use in a Class III-A area includes potable use. These well restrictions are defined below:

- **Double Case Wells:** With the exception of monitoring wells installed into the first water bearing zone, any proposed well to be installed within the CEA/WRA boundary shall be double cased to an appropriate depth in order to prevent vertical contaminant migration pathways. This depth is either into a confining layer or 50 feet below the vertical extent of the CEA.
- **Sample Potable Wells:** Any potable well to be installed within the footprint of the CEA/WRA shall be sampled annually for the parameters of concern. The first sample shall be collected prior to using the well. If contamination is detected, contact your local health department. If the contamination is above the Safe Drinking Water Standards, then the NJDEP Hotline should be called. Treatment is required for any well that has contamination above the Safe Drinking Water Standards.
- **Evaluate Production Wells:** Any proposed high capacity production wells in the immediate vicinity of the CEA should be pre-evaluated to determine if pumping from these wells would draw a portion of the contaminant plume

into the cone of capture of the production wells or alter the configuration of the contaminant plume.

1. Indicate if there are any other site-specific restrictions on well installation, construction, or use that should be set to restrict potable ground water uses within or near the boundaries of the proposed CEA. If there are any such site-specific well restrictions proposed for this CEA, describe them in the area provided below the question. An example could be reminding property owners that they should ensure that irrigation wells within the plume are not used for drinking water.

SECTION E. Public Notification Requirements

Public notifications are required by N.J.A.C. 7:26C-7.3(d). As indicated by N.J.A.C. 7:26C-7.3(a)4, these notifications must be completed **prior to** submitting the CEA package to BCAIN. Note that although the regulations list seven different types of persons or entities to be notified, the form lists only six of them. This is because, based on N.J.A.C. 7:26C-1.6(a), the NJDEP instructs persons responsible for submitting this form to send notifications only to the entities listed in N.J.A.C. 7:26C-7.3(d)1 through 5 and 7; do **not** to send notifications to the NJDEP bureaus, listed in the "Water Supply Administration" at N.J.A.C. 7:26C-7.3(d)6.

To complete the notifications these persons and entities must be sent **a copy** of the CEA form for every CEA proposal, including historic fill and historically applied pesticides CEAs along with a copy of the associated Cover/Certification Form or the equivalent contact information on that form for the person responsible for conducting the remediation and the LSRP. The NJDEP recommends also sending the site location and CEA maps to the listed entities, with the copy of each form, and a cover letter briefly explaining why the information is being sent. The NJDEP does not recommend sending any additional CEA supporting documentation to the entities listed. Sending a copy of the forms and the maps to any tenants of the properties overlying the CEA is also recommended to provide consistency with the public notification requirements of N.J.A.C. 7:26C-1.7(I)2.

Do **not** send copies of letters sent to the applicable entities or tenants, certified mail receipts, and return receipt request cards, to the NJDEP; see item 2 below for related information to send to the NJDEP. NJDEP approval of the CEA boundaries is not required prior to completing these notifications except as provided by N.J.A.C. 7:26C-2.3(a)3i; as previously indicated, draft CEA proposals must not be submitted to BCAIN.

Notifications are not specifically required for CEA revisions or removals, however, after a Ground Water RAP is issued, copies of the form and information submitted for the biennial remedial action protectiveness determination/certification are also required to be sent to the same list of persons or entities. If before the RAP is issued, the person responsible for conducting the remediation (PRCR) requests that the NJDEP remove or significantly revise a CEA (e.g., CEA boundary changes such that different properties are included), the Department recommends the PRCR notify any persons who own property overlying a CEA and the applicable local government that such a request was submitted to the NJDEP.

The NJDEP webpage http://www.nj.gov/dep/enforcement/county.html may provide links to useful address information for completing some of the public notifications.

1. Indicate which of the entities listed on the form have been notified and the date the notification was mailed. (Note: this date does not need to be on the copies of the form sent to the applicable entities/owners.) Check all that apply.

2. **List of Names and Addresses –** Required by N.J.A.C. 7:26C-7.3(a)4. On the form table and/or an attachment (e.g., Excel spreadsheet), list the entity and property owner names and **complete** addresses of all those notified, including the municipal and county clerks, etc., listed at N.J.A.C. 7:26C-7.3(d). **If the property owner of the site is not the person responsible for the remediation, please check the indicated box on the form and enter that owner's name and address at the top of this form table, not just in an attachment.** Also, if a property owner's mailing address differs from the address of the property they own that is overlying the CEA, please place an asterisk (*) after the address. In addition, to allow cross referencing between the parcels overlying the CEA and the owner of each parcel, in the last column please list the blocks and lots owned by each property owner listed; use the format B: ### to identify the Block and L: ### before the Lot(s) #(s). If there is one owner for multiple properties, the parcel numbers can all be listed in one row or a separate spreadsheet can be submitted with the information. If the CEA overlies a large number of parcels (e.g., >10), submittal of the information on a spreadsheet is requested. In addition, if the CEA is within multiple municipalities or counties, please submit the name/address list on a spreadsheet and add a column, or two, to identify the municipality and county.

ADDENDUM

SECTION B. CEA Component and Vapor Intrusion Information

Complete the form addendum using the instructions for Section B, items 2 and 3 as applicable. Multiple Addendum pages can be copied and submitted if all contaminants or blocks and lots will not fit on one. If the CEA overlies a very large number of properties and/or is in multiple municipalities or counties, a separate spreadsheet or table can be submitted that includes additional columns for the municipality and county for all parcels but it must also include the off-site and VI pathway related information included on the form tables.