

DEP PRE-DEVELOPMENT SITE CHARACTERIZATION SPREADSHEET INSTRUCTIONS

August 2024

Introduction

The Department of Environmental Protection (DEP) has developed the Pre-Development Site Characterization (PDSC) Spreadsheet (Spreadsheet) to facilitate implementation of Section 3.2.4 (Preliminary Site Evaluation for Infiltration Capabilities) and Appendix C (Karst Terrain) of the requirements of 25 Pa. § 102.8(g)(1). The Spreadsheet was designed using the latest version of Microsoft Excel® and is in Excel macro workbook (XLSM) format. Completion of the Spreadsheet is a requirement of PCSM Module 2 for most projects needing a permit under Chapter 102.

Users should check DEP’s website periodically for updates to the spreadsheet and instructions by visiting www.dep.pa.gov/constructionstormwater and selecting “E&S Resources”. In general, DEP/CCD will accept older versions of the spreadsheet no more than 6 months following the revision date of the spreadsheet. DEP/CCD also reserves the right to request completion of the latest version of the spreadsheet for any project.

Questions on the use of the spreadsheet can be directed to the Bureau of Clean Water at RA-EPCHAPTER102@pa.gov.

General Information

It is important that the user follow these instructions carefully. Omission of data in any cell designed for data entry may result in the failure of important calculations on the same or different worksheets.

If prompted by Excel after opening the spreadsheet, enable editing and macros. *Note that you may need to add additional Trusted Locations in the Trust Center Settings of Excel in order to run the macros.* These locations may include server drives and/or locations where you intend to save the file for use. The following steps may be taken:

1. Excel Options > Trust Center > Trust Center Settings > Trusted Locations
2. Check the box to “Allow Trusted Locations on my network”
3. Select “Add new location”
4. Browse to select the folder (or server) where the file will be saved, check the “Subfolders of this location are also trusted” box, and then OK.

The top of the worksheet contains a “Clear Form” button. The user may click on the “Clear Form” button at any time to delete **all** data from the current worksheet. If the user wants to revise the information in only one cell, the user should select that cell and use the backspace or delete key to remove the current value and then enter the new value into the cell.

All cells available for data entry or selection from a drop-down menu are highlighted. **The user may use the Tab, arrow, or Enter keys to move from cell to cell. Using the mouse to click from cell to cell may result in validation errors.**

Care must be taken to enter the data in the correct order identified in these instructions to avoid potential errors with the calculations and logic. For example, skipping a cell may prevent a calculation or produce an error message. The spreadsheet is protected. Formulas are not visible but are explained in this document. Validation that exists in the spreadsheet is highlighted and explained in this document.

Completing the Spreadsheet

Background Information

**CHAPTER 102
PRE-DEVELOPMENT SITE CHARACTERIZATION SPREADSHEET**

Project Site Name:

Project Site Area: acres Applicant:

Will PCSM requirements for the project be satisfied entirely by stormwater capture and use or riparian forest buffer SCMs or can the entire project be considered a site restoration activity?

Yes No

- **Project Site Name** – Enter the Project Site Name that will be or has been identified on the application or Notice of Intent (NOI) for a Chapter 102 permit.
- **Project Site Area** – Enter the Project Site Area that will be or has been reported on the application or NOI for a Chapter 102 permit. This area may not be less than the anticipated earth disturbance area or “limit of disturbance” (LOD).
- **Applicant Name** – Enter the name of the Applicant that will be or has been reported on the application or NOI for a Chapter 102 permit.
- **Need for PDSC** – Answer the following question by selecting the box for “Yes” or “No”: “Will PCSM requirements for the project be satisfied entirely by stormwater capture and use or riparian forest buffer SCMs or can the entire project be considered a site restoration activity?” If the applicant selects “Yes”, the Spreadsheet will indicate that a pre-development site characterization is not required, and no further entries on the Spreadsheet are necessary. The applicant should select “No” if unsure at this stage.

Yes No ***A pre-development site characterization is not required***

NOTE – While restoration sites do not require pre-development site characterization for PCSM related concerns (i.e. infiltration testing, bore logs, etc.), the requirement for pre-development site characterization in regard to environmental due diligence must still be performed. Site contamination and prior land uses must be assessed and considered in regard to permit conditions and plan development. Mobilization of contaminants to water resources must still be considered and proper BMPs must be used to prevent contaminants from entering water resources during earth disturbance.

Karst Information

If the answer to the previous question is “No”, the next question appears as follows:

Is the project site located in an area of known karst terrain?

Yes No

The PCSM Plan preparer must review information, maps and reports maintained by the Pennsylvania Department of Conservation and Natural Resources (DCNR) on carbonate rock formations and sinkholes for all sites in the following counties, at a minimum: Adams, Bedford, Berks, Blair, Bucks, Centre, Chester, Clinton, Cumberland, Dauphin, Franklin, Fulton, Huntingdon, Lancaster, Lebanon, Lehigh, Lycoming, Mifflin, Montgomery, Northampton, and York.

If “No” is selected to this question, the remainder of the sections of the Spreadsheet appear as shown below.

Is the project site located in an area of known karst terrain?

Yes No

Areas Excluded for Infiltration SCMs (attach map(s))

Soils Investigation

Test Pit / Soil Boring Log No. Test Locations:

Infiltration Test Results No. Infiltration Tests:

If “Yes” is selected, additional information is requested regarding karst features:

Is the project site located in an area of known karst terrain?

Yes No **Complete the information below**

Identify the individual(s) responsible for the geotechnical investigation.

ADD ROW

DELETE ROW

Name	Company	License/Certification

Geotechnical investigation techniques (check all that were completed):

- Geophysical survey
- Geotechnical borings
- Soil profiling
- Downstream analysis
- Bedrock core borings
- Field review of adjacent properties
- Identification of sinkholes and closed depressions
- Other:

A geotechnical report has been completed and is attached to Module 2.

Predominant overburden depth across site: ft

- **Individuals responsible for geotechnical investigation** – Enter the names of individuals who completed or assisted with the geotechnical investigation of subsurface conditions at the site and the company(ies) they work for. Select the type of license or certification these individuals possess. Use the “Add Row” and “Delete Row” buttons to increase the available rows to enter information, up to 5. If there were additional investigators identify them in an attachment to the Spreadsheet.

DEP expects that a geotechnical investigation will be performed for sites that are within 0.5 mile of identified sinkholes and closed depressions on DCNR’s published maps of sinkholes and karst features; are within 0.5 mile of a “Karst Feature” on DEP’s [eMapPA](#); or where there is a reasonable likelihood that active karst geology exists on a site requiring the design of stormwater management.

- **Geotechnical investigation techniques** – Check all appropriate boxes to reflect the investigation techniques used. Select the box for “Other” and enter a description if applicable. A geotechnical report should be attached to PCSM Module 2 for submission with a Chapter 102 permit application or NOI.
- **Predominant overburden depth across site** – Enter the depth, in feet, of overburden material (soil and non-carbonate rock) that exists over a majority of the project site based on the geotechnical investigation. Where a

value less than 33 feet is entered, the Spreadsheet will indicate that infiltration may not be feasible, and that Managed Release Concept (MRC) Karst stormwater control measures (SCMs) should be considered:

Predominant overburden depth across site: ft

Infiltration may not be feasible (consider MRC Karst SCM(s))

This result does not mean that an investigation of a site's infiltration capabilities cannot be pursued, as it is the judgment licensed professional designing stormwater management on the karst site that ultimately determines whether infiltration may be feasible on a site; however, if an investigation of infiltration capabilities is not completed, DEP and delegated county conservation districts (CCDs) will accept this recommendation.

Where a value that is greater than or equal to 33 feet but less than 50 feet is entered, the Spreadsheet will recommend that a sinkhole risk assessment be completed.

Predominant overburden depth across site: ft

A sinkhole risk assessment is recommended

Sinkhole risk:

DEP does not provide guidance on completing a sinkhole risk assessment. There are multiple approaches available to conduct risk assessments (e.g., see publications by [American Society of Civil Engineers](#), [U.S. Department of Transportation](#)) and the licensed professional can select any approach that is considered scientifically sound and appropriate for the project. The sinkhole risk assessment should be part of the geotechnical report. Where the sinkhole risk is considered low, the Spreadsheet will recommend that the site be investigated further for infiltration capabilities.

Sinkhole risk: ***An investigation of infiltration capabilities is recommended***

When the sinkhole risk is considered moderate or high, the Spreadsheet will indicate that infiltration may not be feasible, and that MRC Karst SCMs should be considered (subject again to a licensed professional's decision):

Sinkhole risk: ***Infiltration may not be feasible (consider MRC Karst SCM(s))***

Where a value for predominant overburden depth is entered that is at least 50 feet, the Spreadsheet will recommend that an investigation of infiltration capabilities occur.

Predominant overburden depth across site: ft

An investigation of infiltration capabilities is recommended

Areas Excluded for Infiltration SCMs

The Spreadsheet recommends that a preliminary site evaluation for infiltration capabilities is conducted in which at least one infiltration test location is investigated for every 40,000 square feet across the project site, equally distributed across the site, with a minimum of 4 test locations. It is important to understand that opportunities for infiltration may exist outside of the LOD, within the project site boundary, and DEP expects these areas will be evaluated. However, DEP understands that there are multiple constraints that could be present on a project site that would render infiltration infeasible or undesirable. These constraints can be identified to reduce the area of the project site that requires a preliminary site evaluation for infiltration capabilities. These constraints, which are identified in the Spreadsheet as "exclusions", are as follows:

1. Areas of a project site that will be disturbed for underground utilities or other infrastructure and then restored to approximate original condition.

2. Areas that have been field verified, prior to or in conjunction with subsurface investigations for infiltration capabilities, as having shallow bedrock conditions that would not comply with separation distance guidelines contained in this Manual or local ordinances for infiltration-based SCMs.
3. Areas that have been field verified, prior to or in conjunction with subsurface investigations for infiltration capabilities, as having a seasonally high water table (SHWT) and/or hydric soil conditions that would not comply with separation distance guidelines contained in this Manual or local ordinances for infiltration-based SCMs.
4. Areas that are impervious land cover in the pre-construction condition and will not be disturbed and areas where road maintenance activities will occur as defined at 25 Pa. Code § 102.1.
5. Areas that are defined at 25 Pa. Code § 102.1 as surface waters and waters of this Commonwealth and areas that are defined at 25 Pa. Code § 105.1 as floodways and floodplains.
6. Areas where soils at horizons conducive to infiltration for a project are known to contain pollutant concentrations exceeding the medium-specific concentrations (MSCs) contained in 25 Pa. Code Chapter 250, Appendix A, Tables 3 and 4 (Soil to Groundwater Numeric Values, Used Aquifers, TDS ≤ 2,500 mg/L, for residential or non-residential development).
7. Existing areas on a site that will be protected long-term as a Natural Stormwater Feature SCM and areas intended for establishment or enhancement of a riparian buffer or riparian forest buffer SCM.
8. Areas that will not be disturbed where slopes exceed 20%, including 10 feet from the top and top of slope.
9. Areas that must be avoided to comply with laws regarding the protection of threatened and endangered species.
10. Upland areas that are remote from earth disturbance activities and would be unable to receive stormwater from new impervious surfaces by gravity flow.
11. Areas where infiltration could, in the opinion of a licensed professional, lead to public safety concerns and/or pollution based on field observations or studies.
12. Other areas that must be avoided to meet setback guidelines of the PCSM Manual or other requirements of local ordinances.

If any exclusion applies to the project, select the exclusion number from the dropdown list.

Areas Excluded for Infiltration SCMs (attach map(s))

Exclusion	Description	Area (ac)

Area Unsuitable for Infiltration SCMs (ac):
Area Potentially Suitable for Infiltration SCMs (ac):

The corresponding description will auto-populate. Then enter the area, in acres, associated with the exclusion. Use the “Add Row” and “Delete Row” buttons as necessary. A map must be provided that clearly identifies all excluded areas; it is recommended that hatching or color coding be used with a legend that corresponds to the exclusion numbers in these instructions. At the bottom of the table the area unsuitable for infiltration SCMs is summed. The area potentially suitable for infiltration SCMs is the Project Site Area minus the sum of the Area Unsuitable for Infiltration SCMs.

Soils Investigation

This section requests the methods used to investigate soils and the professionals involved with the investigation.

Soils Investigation

Investigation method(s): Test pits Soil borings Other:

Name(s) of professional(s) overseeing soils investigation:

ADD ROW

DELETE ROW

Name	Company	License/Certification

- **Investigation method(s)** – Select the appropriate boxes to indicate the method(s) used: test pits, soil borings, or other methods. Enter a description if “Other” is selected.
- **Professional(s)** – Enter the name of all individuals who oversaw and/or conducted the soils investigation and the companies they work for. Select the type of license or certification from the dropdown list. Use the “Add Row” and “Delete Row” buttons as necessary.

Test Pit / Soil Boring Log

The Test Pit / Soil Boring Log section contains some but not necessarily all of the information that would typically be collected during a soils investigation and reported on in the field. For example, a classification or characterization of the soils encountered is also generally necessary for a PDSC. An applicant is not required to attach field logs to the application/NOI but may do so if there is information the applicant believes would assist DEP/CCD with its review. The Spreadsheet requests the minimum information necessary to evaluate whether an adequate PDSC was completed. Start by selecting the number of test locations from the dropdown list, up to 100. If more than 100 test pits or borings were completed, two or more instances of the Spreadsheet should be used to represent the project site. A minimum of 4 test pits or soil borings with infiltration tests is generally required for any site where a PDSC is needed.

Test Pit / Soil Boring Log

No. Test Locations:

Test Location ID	Investigation Method	Total Depth Investigated (ft)	Limiting Zone Elevation (ft)	Limiting Zone Description	Infiltration Test(s) Completed?

- **Test Location ID** – Enter a unique identification (ID) number for each test pit or boring completed. The ID number should be shown on a map or PCSM Plan Drawing.
- **Investigation Method** – Select the method from the dropdown list. The options will be Test Pit, Soil Boring, Other, and any combination thereof dependent on the selections made in the Soil Investigation section.
- **Total Depth Investigated** – Enter the total vertical depth advanced in the pit or boring, in feet, as measured from the ground surface.
- **Limiting Zone Elevation** – If a zone was encountered that would restrict infiltration (limiting zone), report the elevation where the limiting zone is first encountered, in feet above mean sea level (ft msl). If a limiting zone is not encountered or if a test pit or boring advances through a limiting zone to determine its depth, and potentially suitable soils are identified below the limiting zone that may be used for infiltration, leave this cell blank.

- **Limiting Zone Description** – If a limiting zone elevation is entered, select the type of limiting zone from the dropdown list.
- **Infiltration Test(s) Completed?** If an infiltration test(s) was conducted within the test pit or boring, select “Yes”, otherwise “No”.

Infiltration Test Results

Select the number of infiltration tests that were completed in all test pits and/or borings from the dropdown list, up to 100. If more than 100 tests were completed, two or more instances of the Spreadsheet should be used to represent the project site.

Infiltration Test Results No. Infiltration Tests:

Test Location ID	Infiltration Test ID	Infiltration Test Elevation (ft)	Infiltration Test Method	Field Ksat (in/hr)	Air Temp (°F)	Adjusted Ksat (in/hr)

- **Test Location ID** – If an infiltration test was completed for a Test Location ID that is entered into the Test Pit / Soil Boring Log section, the Test Location ID will be available in the dropdown list to select from.
- **Infiltration Test ID** – Enter a unique ID number for each infiltration test completed. The ID number should be shown on a map or PCSM Plan Drawing.
- **Infiltration Test Elevation** – Enter the elevation, in ft msl, in which the infiltration test was conducted.
- **Infiltration Test Method** – Select the infiltration test method from the dropdown list. The options are Single Ring (infiltrometer), Double Ring (infiltrometer), Cased Borehole, and Other. Select Single Ring or Double Ring if the test device is seated at the bottom of the test pit where seating can be visualized to ensure there is no water loss from the testing area. If seating cannot be visualized select Other.
- **Field Ksat** – Record the saturated hydraulic conductivity (Ksat) measured by the infiltration test, in inches/hour (in/hr).
- **Temperature (Temp)** – Select the test water temperature at the time of the infiltration test from the dropdown list, in degrees Fahrenheit. If water temperature was not measured, select the air temperature at the time of the test.
- **Adjusted Ksat** – The Spreadsheet adjusts the Field Ksat result using temperature adjustment factors contained in Appendix B, Table B-5 of the draft PCSM Manual using a reference temperature of 65°F, to account for the effects of temperature on water viscosity.

Results

Below the Infiltration Test Results table, the Spreadsheet evaluates the adequacy of the PDSC. The recommended infiltration test location frequency is displayed as 1 test location per 40,000 square feet, with a minimum of 4 test locations. Note that the recommendation is infiltration test locations (i.e., number of test pits or borings) rather than the total number of infiltration tests. The actual infiltration test location frequency is calculated as follows:

$$\text{Actual Infiltration Test Location Frequency} = \text{Number of Test Locations with Infiltration Tests} / ((\text{Area Potentially Suitable for Infiltration SCMs (acres)} * 43,560 \text{ ft}^2/\text{acre}) / 40,000 \text{ ft}^2)$$

Recommended infiltration test location frequency: 1 test / 40,000 square feet (4 minimum)
Actual infiltration test location frequency: 0.8 test(s) / 40,000 square feet

One or two recommendations will appear once testing location and infiltration test results are entered:

1. **Adequacy of testing locations** – The first recommendation addresses whether the number of testing locations was adequate. The following are possible responses:
 - *The number of infiltration test results entered is less than the number of test pits or borings where infiltration tests were reported; enter all infiltration test results.* This response will be displayed if the number of test pits or soil borings where infiltration testing was conducted, as entered into the Test Pit / Soil Boring Log table, exceeds the number of infiltration results entered.
 - *Additional infiltration tests are recommended.* This response will be displayed if either 1) the Actual Infiltration Test Location Frequency is less than 0.5, or 2) the number of unique test locations is less than 4, or 3) the Investigation Method is either Soil Boring or Other and less than 2 infiltration test results have been entered for that test location. The Spreadsheet recommends that at least two infiltration tests should be completed for the cased borehole method and other infiltration test methods where the seating of the device cannot be observed to ensure water loss does not occur. For example, if the user indicates Soil Boring 1 (SB-1) had infiltration tests completed, but there are not at least 2 tests in the Infiltration Test Results table for SB-1, this response will be displayed.
 - *The coefficient of variation (CV) for infiltration test results is relatively low (___). Additional infiltration tests may be unnecessary at the discretion of the professional.* This response will be displayed if the Actual Infiltration Test Location Frequency is less than 1 but at least 0.5 AND the CV of the infiltration test results (i.e., the standard deviation of test results divided by the average of test results) is less than or equal to 0.5. In these cases the professional overseeing the PDSC may conclude that subsurface conditions are sufficiently uniform across the site such that additional test locations are not warranted.
 - *The coefficient of variation (CV) for infiltration test results is moderate to high. Additional infiltration tests are recommended.* This response will be displayed if the Actual Infiltration Test Location Frequency is less than 1 but at least 0.5 AND the CV of the infiltration test results exceeds 0.5. In these cases the variability of infiltration results is sufficiently high that additional test locations are warranted.
2. **Site infiltration capabilities** – The second recommendation will populate if additional infiltration testing is not recommended and addresses whether the site has the potential for infiltration-based SCMs. The following are possible responses:
 - *Based on Ksat results alone (not considering limiting zones), opportunities for infiltration SCMs may exist on-site. These opportunities must be maximized to the extent practicable.* This response will be displayed when sufficient tests were completed, and one or more infiltration test results exceeds 0.25 inch/hour.
 - *Infiltration potential may be limited and use of MRC SCMs may be considered.* This response will be displayed when sufficient tests were completed, and all infiltration test results are less than or equal to 0.25 inch/hour.

If the professional overseeing the PDSC disagrees with any of the recommendations and/or wishes to clarify the decisions made in response to the PDSC, the professional should submit an attachment with their rationale. DEP/CCD will consider the rationale when conducting a review of PCSM Module 2.

Revision History

Date	Version	Revision Reason
8/2024	1.0	Original

DRAFT