

Appendix B - Volume Control / Infiltration Worksheet

This Appendix contains a worksheet and related information that can be used as a guide in evaluating conformance to the volume control and infiltration requirements for storm water practices specified in Appendix C. The worksheet contains a step that accounts for non-infiltration practices where groundwater recharge will not directly occur, including rain barrels, cisterns, roof gardens and other “storage-type” practices as well as filtration practices that use an under drain.

The worksheet does not replace the need to provide detailed plans, specifications calculations and related information for review by City staff as required in the Standards (Appendix C).

Volume Control / Infiltration Practice Worksheet – Revised 2022

Burnsville, MN

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Owner / Developer Name:

Site Name/Block or Outlot

ID: _____

Step 1: Determine the site areas for your project.

- A. Total site area in acres. _____ ft²
_____ acres
- B. Total new impervious area: _____ ft²
_____ acres
- C. Total redeveloped impervious area: _____ ft²
_____ acres
- D. Sum of new impervious area (B) and redeveloped impervious area (C): _____ ft²
_____ acres

Step 2: If **B** is greater than or equal to 5,000 ft² OR **D** is greater than or equal to 1 acre - Calculate treatment volume. If no, move to **Step 3**.

2.1. For Linear Projects: Treatment Volume = The larger of 2.1.1 and 2.1.2.

2.1.1. Treatment Volume = **D** (acres) x 0.55 (inch) x 1/12 (ft/inch) x 43,560 (ft²/acre)

$$= \text{_____} \times 0.55 \times 1/12 \times 43,560 = \text{_____} \text{ cu.-ft}$$

2.1.2. Treatment Volume = **B** (acres) x 1.1 (inch) x 1/12 (ft/inch) x 43,560 (ft²/acre)

$$= \text{_____} \times 1.1 \times 1/12 \times 43,560 = \text{_____} \text{ cu.-ft}$$

2.2. For All Other Projects: Treatment Volume = **D** (acres) x 1.1 (inch) x 1/12 (ft/inch) x 43,560 (ft²/acre)

$$= \text{_____} \times 1.1 \times 1/12 \times 43,560 = \text{_____} \text{ cu.-ft}$$

Step 3: If **C** is greater than or equal to 0.5 acre but less than 1 acre - Calculate treatment volume.

3.1. Treatment Volume = **D** (acres) x 0.55 (inch) x 1/12 (ft/inch) x 43,560 (ft²/acre)

$$= \text{_____} \times 0.55 \times 1/12 \times 43,560 = \text{_____} \text{ cu.-ft}$$

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Step 4: Sites with Restrictions.

Identify if the site has any of the following restrictions (for more information, see Development Standards Section IV.1.A.iii.):

Infiltration Prohibited Area	Present On Site	Additional Considerations
Vehicle fueling and maintenance areas	<input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, consider other treatment locations on site. Provide documentation of infeasibility as needed.
Contaminated soils or groundwater	<input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, complete the MPCA's screening assessment checklist.
Soil Infiltration Rates > 8.3 inch/hr	<input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, provide soil investigation documentation. Consider soil amendments and provide documentation of infeasibility as needed.
Less than 3 ft of separation from seasonally saturated soils or bedrock	<input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, provide soil investigation documentation.
Soils predominately HSG D (clay)	<input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, provide soil investigation documentation.
The City's Drinking Water Protection Overlay	<input type="checkbox"/> Yes <input type="checkbox"/> No	
ERA within a DWSMA of moderate vulnerability, or outside of ERA within a DWSMA of high or very high vulnerability	<input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, perform a higher level of engineering review to ensure no adverse impacts to groundwater.
1,000 ft upgradient or 100 ft downgradient of karst	<input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, consider other treatment locations. Provide documentation of infeasibility as needed.
Industrial Stormwater runoff regulated by the NPDES ISW program	<input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, consider other treatment locations. Provide documentation of infeasibility as needed.
Steep, very steep, or severe slopes ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, consider other treatment locations. Provide documentation of infeasibility as needed.

¹See definitions for steep, very steep and severe slopes in the City's WRMP, Appendix C Development Standards

If the site area is considered a site with restrictions, alternative stormwater compliance such as filtration or wet detention may be pursued. Supporting documentation must be provided to justify infeasibilities. Alternative compliance must be designed to treat the required treatment volume identified in Steps 1-3.

Step 5. Infiltration Rate and Maximum Draw Down Time

Infiltration and filtration practices must be designed to draw down to the bottom of the practice within 48 hours. The maximum ponding depth shall be based on the soil infiltration rate determined from site-specific soils investigation data taken from the location of proposed infiltration practices on the site. The soils investigation requirement may be waived for smaller property practices (such as residential systems) where the maximum ponding depth is one (1) foot or less.

Infiltration Rate = _____ in/hr. (Provide documentation)

Maximum Allowable Ponding Depth (ft) = Infiltration Rate (in/hr) x 48 (hr) x 1/12 (ft/in)

= _____ x 48 x 1/12 = _____ ft

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Step 6. Determine treatment volume provided

For each of the practices you will use, enter the data in the table provided below to summarize total water quality volume and total pollutant removal. Note that sites that have met treatment requirements via volume reducing BMPs have generally considered to have met pollutant reduction requirements as described in the Development Standards Section IV.B. without additional documentation. For projects where volume reducing BMPs do not fully satisfy the water quality volume requirement, pollutant removal standards apply. Provide detail in the plans and stormwater management plan to support the data noted.

Required Treatment Volume (from Steps 1-3): _____ cu.-ft

BMP Name / ID	Type of BMP	Volume Retained ¹ (cu.-ft)	Volume Treated ² (cu.-ft)	If Volume Retained ≥ Required Treatment Volume, skip these columns	
				Annual Total Phosphorus (TP) Removal (lbs)	Annual Total Phosphorus (TP) Removal (lbs)
Total					
Overall Net Decrease in Pollutant Loading (%)					

¹Volume retained is defined as the volume retained on site via volume reduction practices, such as infiltration.
²Volume treated is defined as the volume treated via alternative stormwater compliance, such as filtration or wet detention.

Step 7. Confirm Water Quality Volume Requirements Are Met.

The total volume retained and/or treated as summarized in Step 6 must be equal to or greater than the required treatment volume as calculated in Steps 1-3.