2009 Wisconsin Act 28

- Transferred regulation of erosion and sediment control and stormwater management for commercial buildings sites from the Dept. of Commerce to the Dept. of Natural Resources

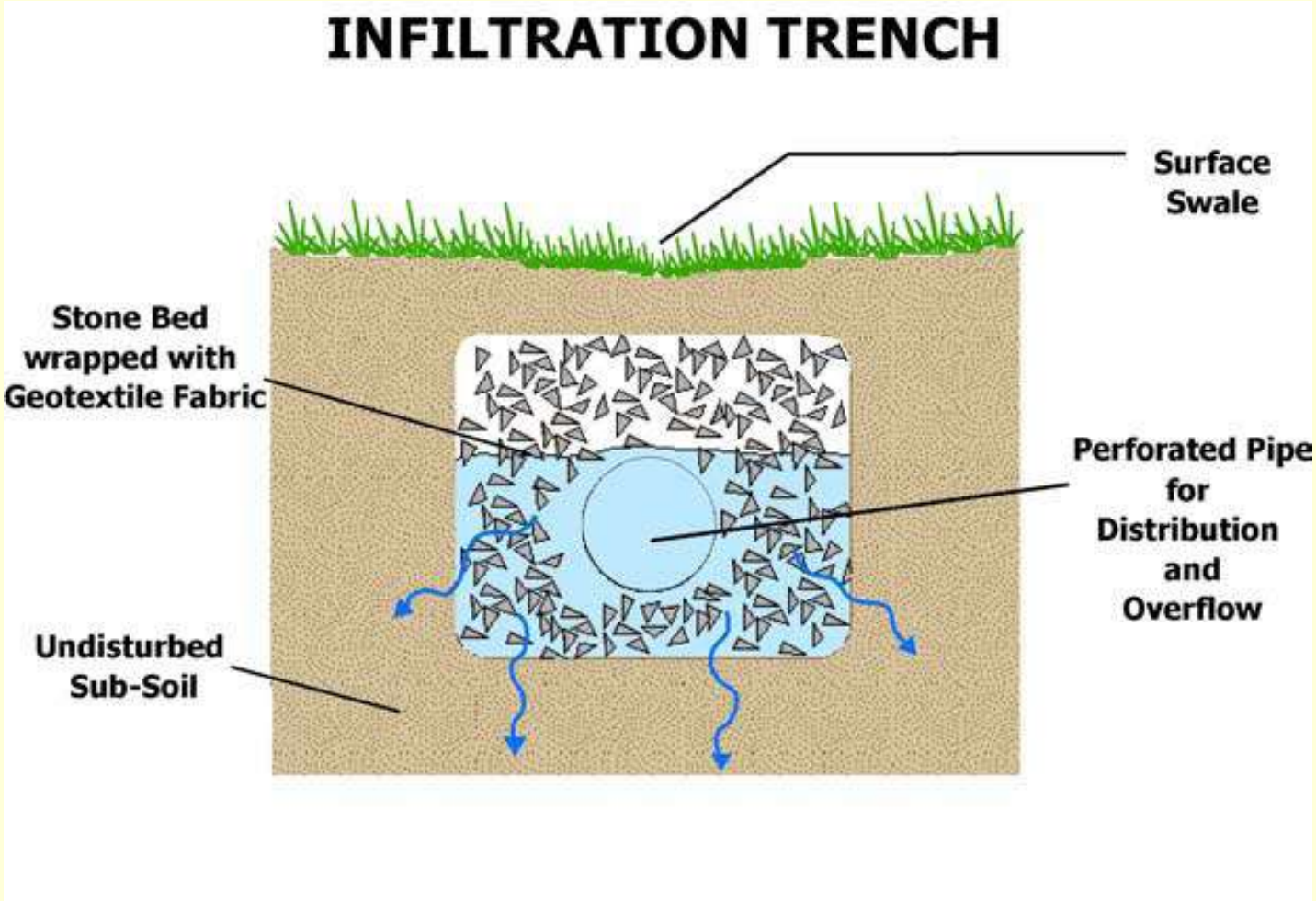
2009 Wis. Act 28 *cont.*

- Effective January 1, 2010
- Requires an MOU between DNR and Commerce to coordinate the transfer

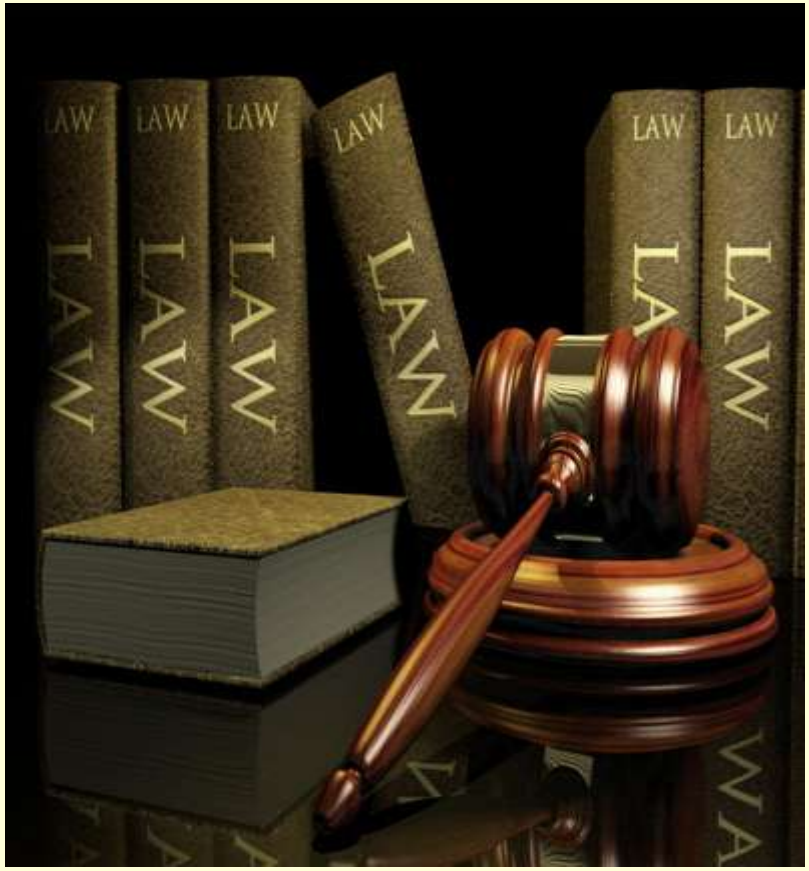
2009 Wis. Act 28 *cont.*

- DNR will enforce Comm 60 until NR 151 and 216 is updated to include commercial building sites
- Any pending matter with Commerce became a pending matter for the DNR
- DNR recognizes any NOI's filed with the Commerce

INFILTRATION TRENCH DRAFT SOC STANDARD
(No. TBD)



How to use the standard



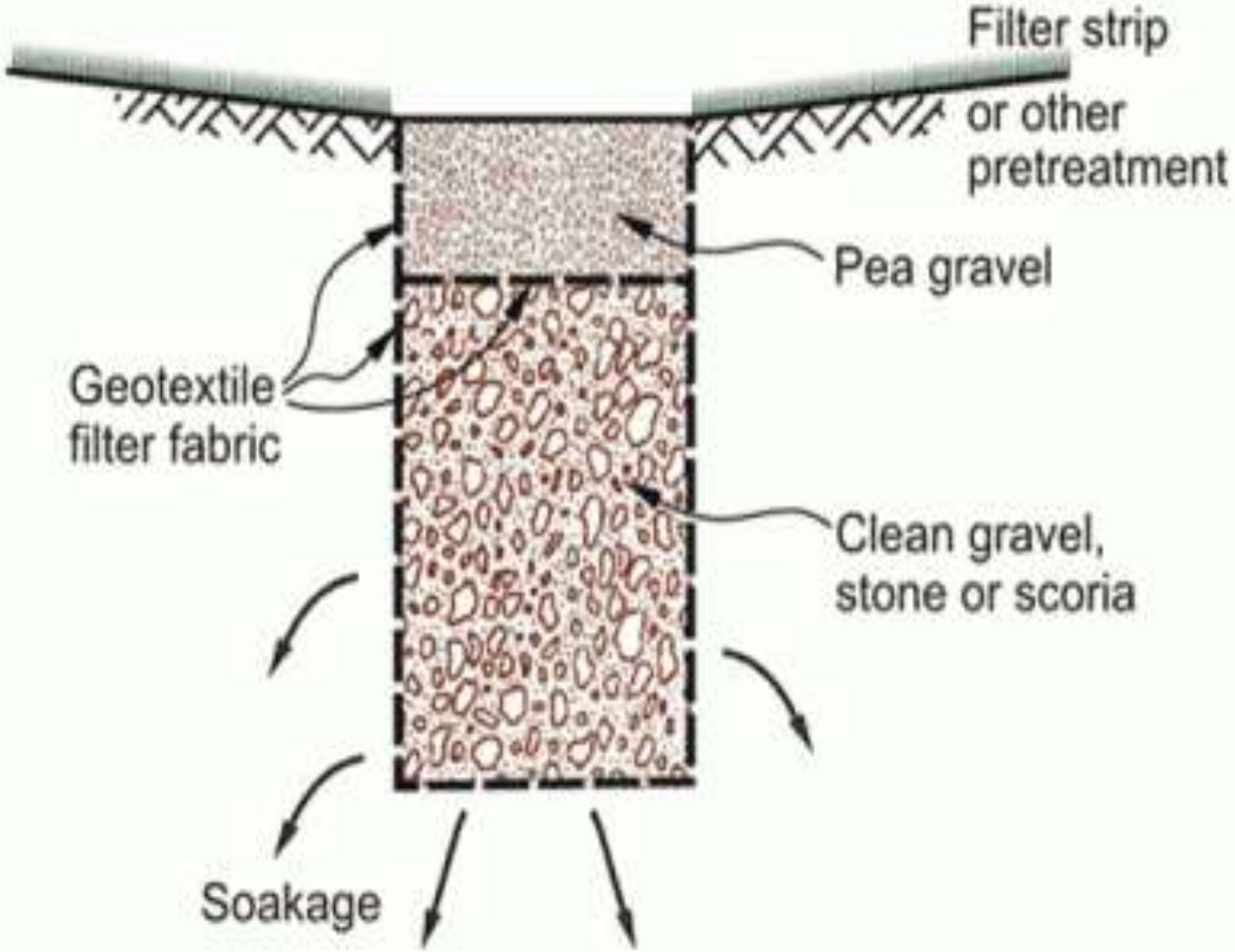
- Used in conjunction with:
  - SOC (No. 1002, Site Evaluation for Stormwater Infiltration)
  - DNR (NR 151)
  - Comm. 82
  - applicable federal, state and local standards

What is the SOC?

- **The Standards Oversight Council oversees the development, maintenance and distribution of quality technical standards to support urban and rural land and water conservation programs in Wisconsin**
- Participating members include: USDA-NRCS, WDNR, WI Assoc. of Land Conservation Employees; WI Land & Water Conservation Assoc.; WI Dept. of Ag., Trade & Consumer Protection; WI Dept. of Commerce; University of WI - Extension
- www.socwisconsin.org

What is an infiltration trench?

- A stormwater practice that collects and stores runoff until it can infiltrate into the subsurface soil. They are:
  - Longer than they are wide (less than 15’ wide)
  - Intended to promote infiltration
  - Commonly filled with graded media but manufactured storage/infiltration medium will make a strong push to overcome the historical pipe/stone systems


Filter strip
or other
pretreatment
Pea gravel
Geotextile
filter fabric
Clean gravel,
stone or scoria
Soakage

Purpose

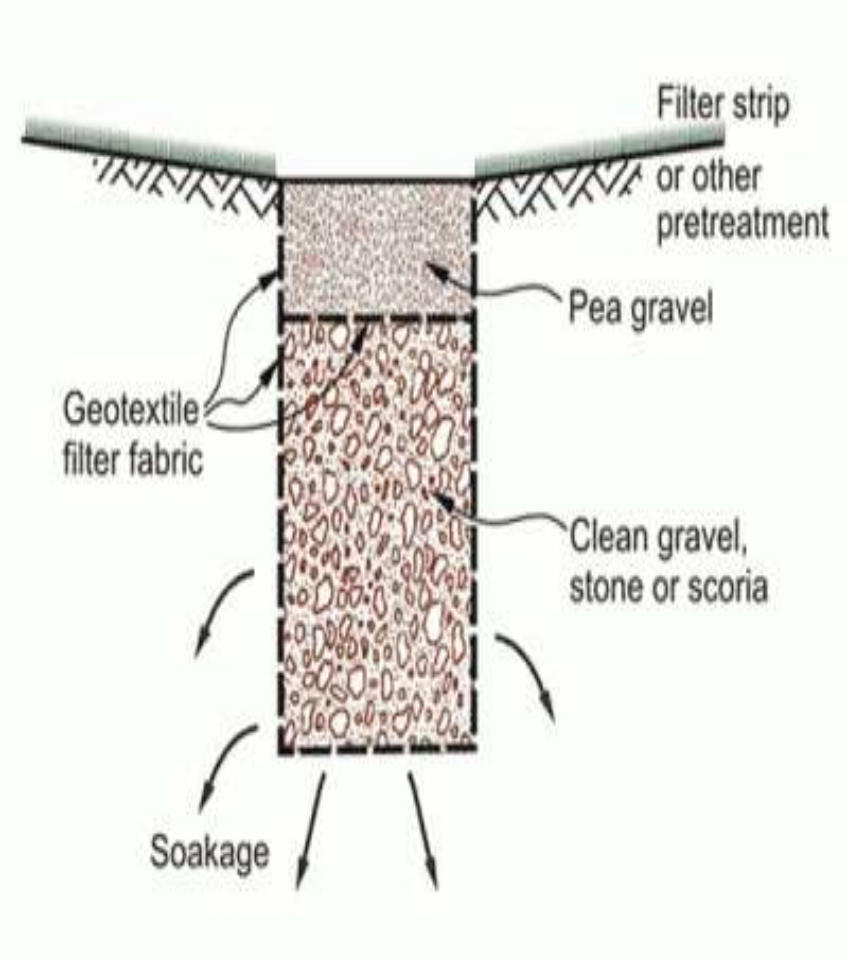
- May be applied individually or as part of a structural SW plan to support one or more of the following:
  - Enhance SW infiltration to recharge GW
  - Reduce discharge of pollutants to surface and GW's
  - Decrease runoff peak flow rates and volumes

Site Criteria

- Use WDNR Conservation Practice Standard 1002, NR 151, and Comm 82 (if applicable), plus
- 10’ building foundation setback to trench unless it can be demonstrated that there will be no negative impacts
  - Water in basements
  - Short circuiting through foundation drain
- Discharge may not cause side slope seepage that contributes to hill slope failure or increased erosion

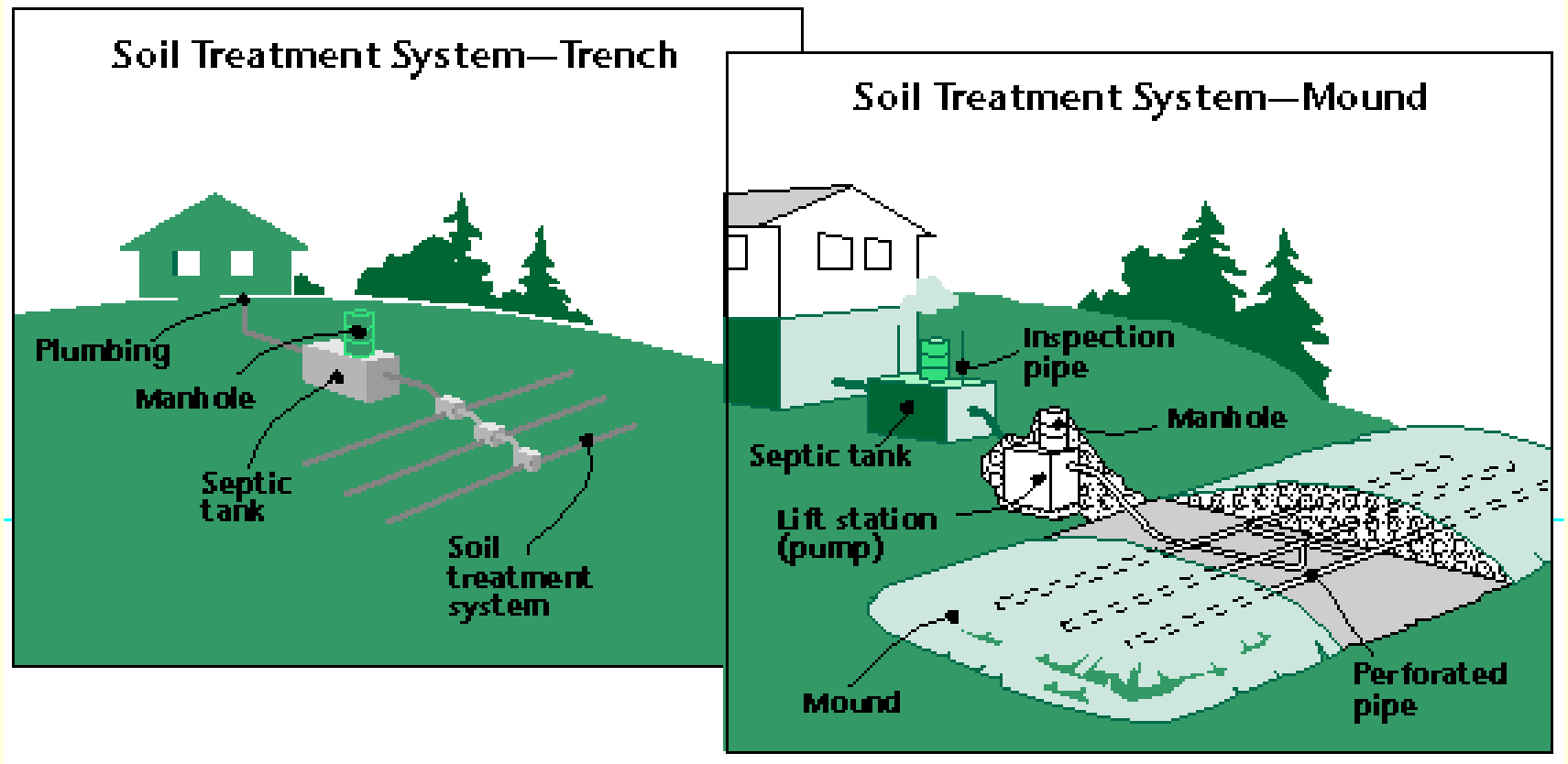
Site Criteria *cont*.

- For surface entrance, slopes upgradient of trench must be at least 1% to ensure positive flow and less than 20%



Site Criteria *cont*.

- At least 50’ from a POWTS dispersal cell



Key Design Criteria

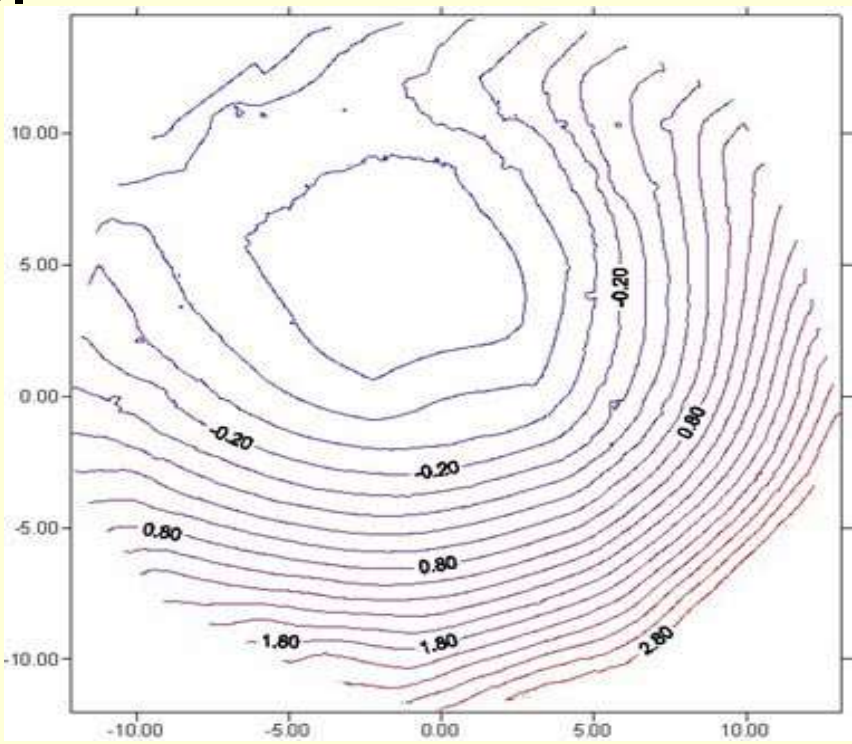
- Pretreatment Practices
  - Must be done prior to infiltration
  - TSS Removal for these land use areas:
    - 60% for 1-2 family areas and roads
    - 80% for commercial and public areas
  - Rooftop runoff may discharge directly to the trench with debris removal > ½ inch

Key Design Criteria *cont*.

- Soil infiltration rates see WDNR Conservation Practice Standard 1002 and Comm 82.365 for plumbing systems
- Storage volume function of depth, width, length and porosity of storage medium
- Max. width $\leq$ 15’ and depth < length or width (may otherwise be a Class V injection well)

Key Design Criteria *cont*.

- Effective infiltration area based upon open bottom area only
- Bottom of trench is level
- Orient length of trench parallel to slope contour



Key Design Criteria *cont*.

- Series of trenches ok with some conditions

Key Design Criteria *cont*.

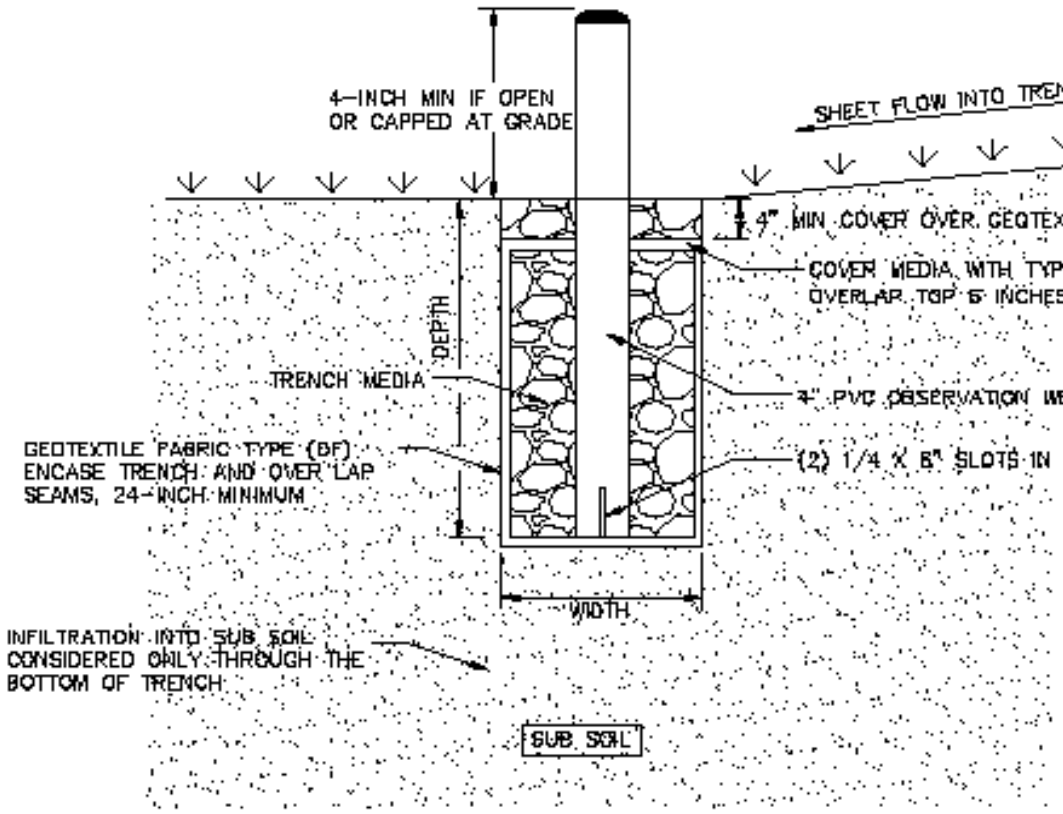
- Even distribution of influent accomplished to disperse SW along length of trench:
  - Level surface
  - Surface level spreader
  - Perforated pipe

Key Design Criteria *cont*.

- Storage cell
  - Stone aggregate or gravel-less system
    - Gravel-less system approved for use by Commerce

Key Design Criteria *cont.*

- Overflow method to safely convey 100-year storm event
- Observation pipes to monitor level of ponded water along length of trench



TYPICAL INFILTRATION TRENCH SECTION

NOTE:
1) THE WIDTH OF THE GEOTEXTILE FABRIC MUST INCLUDE SUFFICIENT MATERIAL TO CONFORM TO PERIMETER IRREGULARITIES AND FOR A 6-INCHES MINIMUM TOP OVERLAP.
2) WHEN OVERLAPS ARE REQUIRED BETWEEN ROLLS, THE UPHILL ROLL SHOULD LAP A MINIMUM OF 24-INCHES OVER THE DOWNHILL ROLL IN ORDER TO PROVIDE A SHINGLED EFFECT.

INFILTRATION TRENCH

NOT TO SCALE
2/10

VAI-STM-30

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Construction

- Responsible person in charge of trench construction
  - Trained and experienced in construction, operation and maintenance of infiltration systems

Construction *cont*.

- Construction halted if soil moisture content results in smearing, clumping or other forms of compaction

Construction *cont*.

- Trench brought online when tributary area draining to trench is 90% stabilized
- Avoid compaction in area of trench
- Compaction mitigation if smearing is observed @ bottom of trench
  - Incorporate two inches of coarse sand and refracture to a depth of 12 inches
  - Re-evaluate area for consistency with original site investigation

Construction *cont*.

- Care should be taken to avoid sedimentation from entering the trench
- Trim large tree roots before placing geotextile fabric in trench
- Place clean aggregate and overlap geotextile a min. of 6 inches
- Field Inspection Checklist in Appendix A

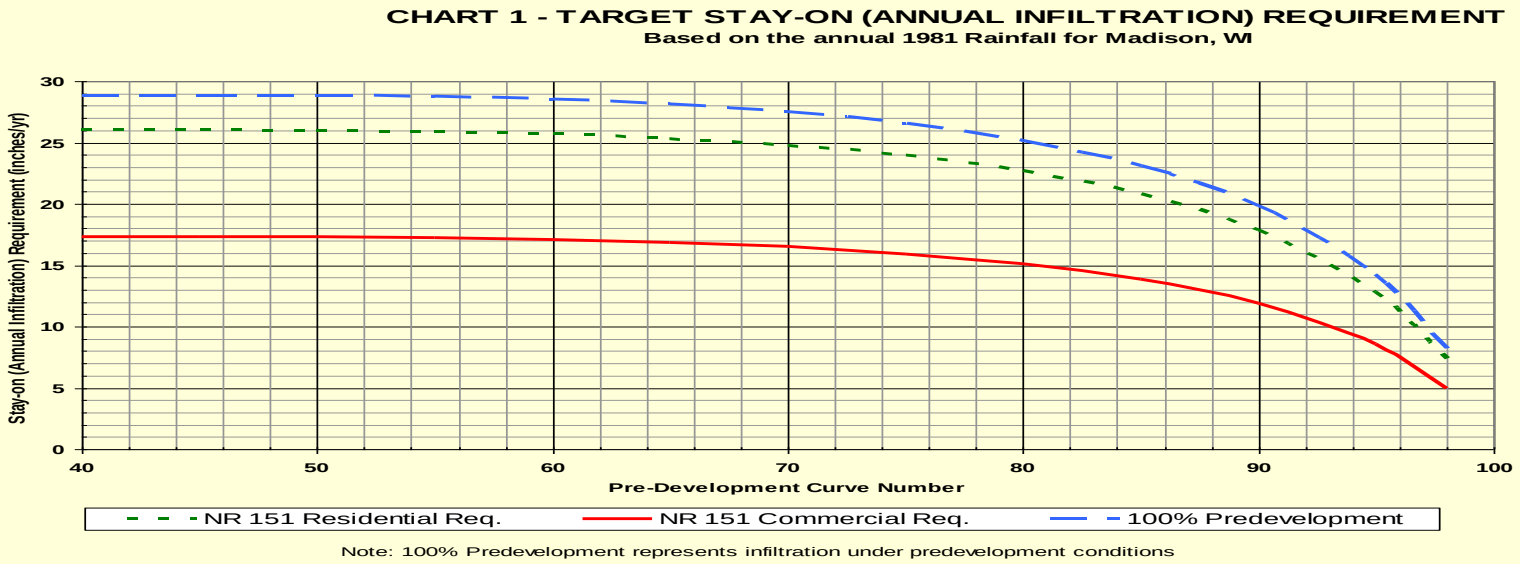
Considerations/Recommendations

- Pretreatment options
  - See other Wisconsin Conservation Practices
  - Treatment credits through accepted modeling practices such as SLAMM and P8.
- Lawn Treatment – avoid application of nutrients and pesticides upgradient of trench
- Plantings to further remove pollutants and reduce erosion

Considerations/Recommendations

cont.

- Target Stay on depth
  - May use 12 design charts on the DNR website
- Use of RECARGA
  - Should not be used to size an infiltration trench due to an evapotranspiration component



Considerations/Recommendations

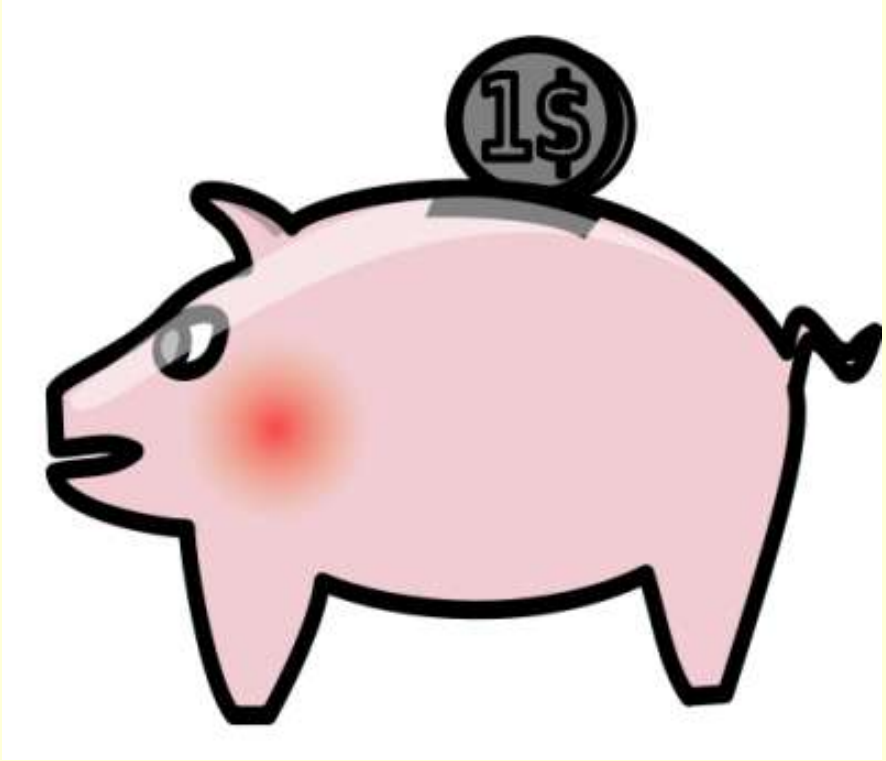
cont.

- Consider identifying location of trenches in an emergency action plan in case of a spill, etc.

Considerations/Recommendations

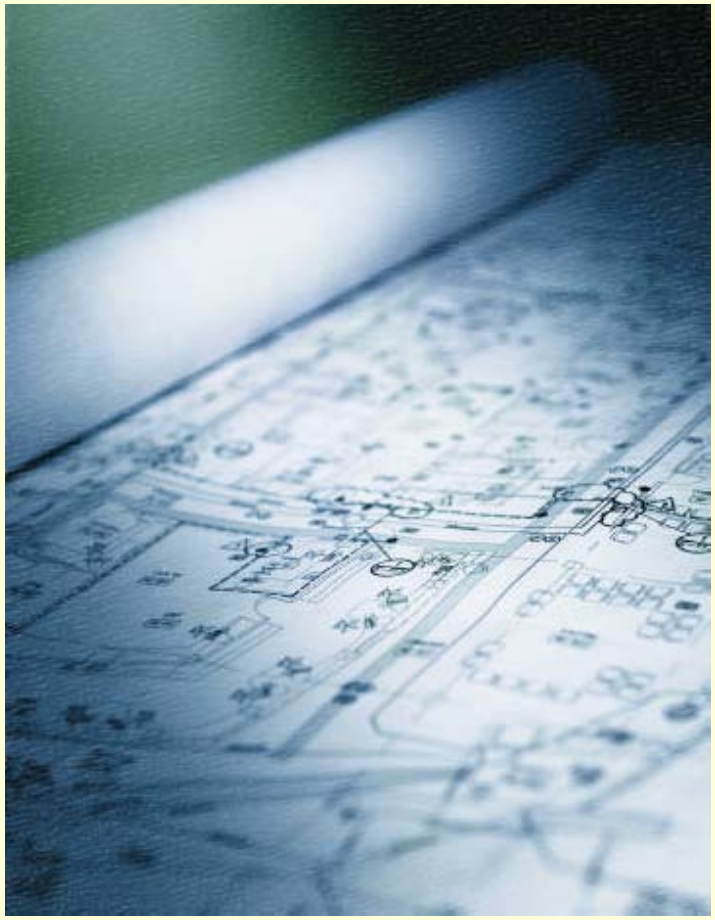
cont.

- Create a separate financial account to fund operation, maintenance and replacement



Other Requirements

- Plans, specifications and supporting data
  - Site plan
  - Construction details
  - Site data including soils
  - Hydrologic data
  - Narrative
    - Responsible parties
    - Maintenance



Other Requirements *cont.*

- Operation and Maintenance Plan
  - Inspection Checklists
  - Monthly inspections during first year of operation from April – October
  - Remove accumulated material and debris on surface of trench
  - Snow placement (not in infiltration area)
  - Inspect and clean outlets, pipes, swales @ least 2x per yr
  - Check observation pipes and record measurements

Other Requirements *cont.*

- Trench may be considered failing if observation of water depth shows less than 90% of storage volume available

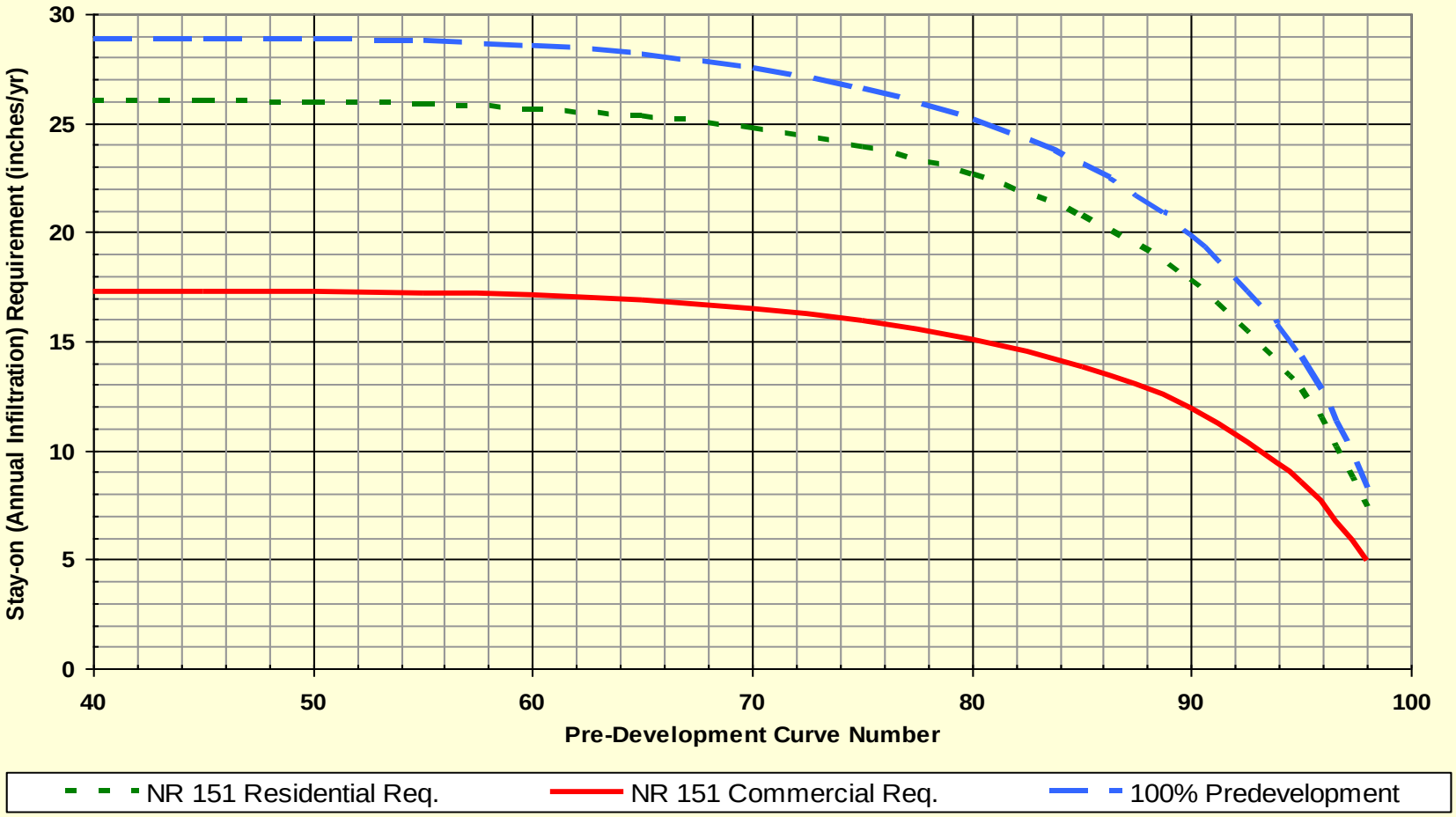
Example 1

- Size and infiltration trench for a 2-acre commercial development. The pre-development CN for the site is 70. The soils are sandy loam with an infiltration rate of 0.5 in./hr.

- Step 1: Find the Target Stay on requirement (chart 1)

CHART 1 - TARGET STAY-ON (ANNUAL INFILTRATION) REQUIRE

Based on the annual 1981 Rainfall for Madison, WI



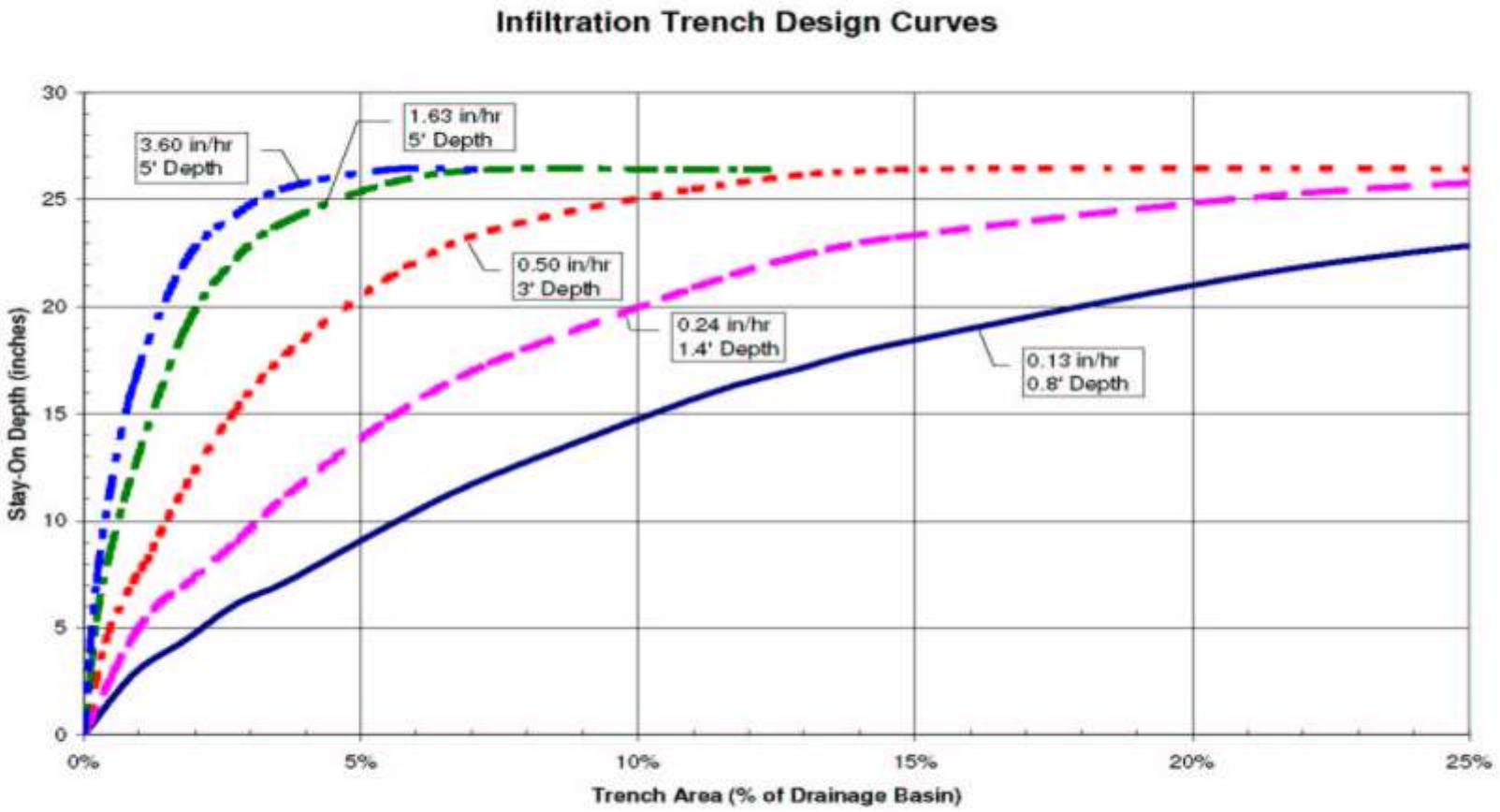
Note: 100% Predevelopment represents infiltration under predevelopment conditions

- Target Stay on requirement ~16.5 in/hr

Example 1 *cont.*

- Step 2: Use the infiltration trench design curves to determine the size of the trench as a % of the drainage area required to meet the target stay-on requirement.

- Go to chart in Appendix B



- Trench area ~3%

Example 1 *cont.*

Answer

- For a 2 acre drainage area:

  2 acres x 43,560 s.f./acre x 0.03 = ***2,614 s.f***. of trench area.
- With a 72 hr max. drawdown time the depth of the trench is: 72 hr x 0.50 in/hr = ***36 in. or 3 ft deep***