



Managing Runoff on Your Property: A DIY Homeowner Site Assessment

Homeowner Workbook



Developed by:



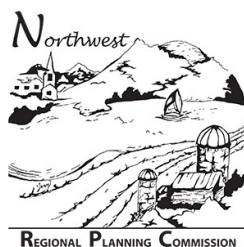
Franklin County Stormwater

A Stormwater Education & Outreach Collaborative



Table of Contents

CONTENTS.....	2
PART 1: IDENTIFY YOUR PROPERTY FEATURES.....	3
Activity 1: Map your property features	5
Activity 2: Estimate percent of property that is impervious	7
PART 2: ESTIMATE STORMWATER GENERATION ON A PROPERTY.....	8
PART 3: MAP OUT FLOW ON A PROPERTY.....	10
Activity 3: Homeowner Property Assessment Questionnaire.....	11
Activity 4: Assess and map your stormwater flow.....	14
PART 4: EVALUATING SOIL SUITABILITY.....	16
Activity 5: Soil Texture Test	17



Contact: Amanda Holland
802-524-5958 or aholland@nrpcvt.com
Northwest Regional Planning Commission



PART 1: IDENTIFY YOUR PROPERTY FEATURES

Learning Objectives:

- ◆ Learn the differences between features on your property such as rooflines, driveway, lawn, flower beds, and unmanaged areas.
- ◆ Understand the impacts of different property feature types.
- ◆ Estimate the percent of your property that creates runoff (impervious) and the percent that can soak it in (pervious).

Lesson 1: Identify features on your property as either an **impervious surface** or **pervious surface**.

Impervious Surfaces

What are they? Hard surfaces that cover the ground and prevent rain and snow melt from soaking into the soil. These can include roofs of buildings, roads, driveway, parking area, walkway, deck, patio, other hard surfaces (including packed gravel paths).



What do they do? Impervious areas increase the amount of stormwater that runs off of your property.

Pervious Surfaces

What are they? Landscaped or natural ground cover that allows rain and snow melt to soak into the soil. These can include grass areas, gardens, and natural areas (i.e. forest or meadow).



What do they do? Pervious surfaces decrease the amount of stormwater that runs off of your property by allowing water to naturally soak into the ground.



PART 1: IDENTIFY YOUR PROPERTY FEATURES

Property Features

Vegetation plays an important role in stormwater management. Trees, meadows, and other vegetative areas have the ability to infiltrate stormwater, filter pollutants, and increase evapotranspiration. The way vegetation is managed, such as application of fertilizer and height of vegetation, can determine how the vegetation will fulfill these tasks. *Poor management can become an additional problem for water quality.*

Managed or Landscaped Areas – Areas with grass or landscaping that you regularly maintain, such as lawn, flower beds or gardens.

Unmanaged or Natural Vegetation – Areas of woods, meadow, or other naturally vegetated areas that are allowed to grow largely unmanaged on your property.

Waterbodies include streams, springs, ponds, lakes, and wetlands and often receive stormwater. Stormwater that drains into these waterbodies can cause several problems such as:

Flooding, stream bank erosion, sedimentation, nutrient overload (from fertilizers, organic waste, or septic systems), decreased dissolved oxygen levels that impact aquatic life, increased prevalence of aquatic vegetation and algae. Many of these problems impact recreational activities such as swimming, boating and fishing.

Built Environment (Structures) refers to human-made surroundings that include buildings, driveways, patios/decks, septic systems, and drinking wells.



PART 1: IDENTIFY YOUR PROPERTY FEATURES

Activity 1: Mapping out your property features

Using an aerial photo explore your property from above and outline the different features (**vegetation both managed and unmanaged, water, built features**) on your property with markers.

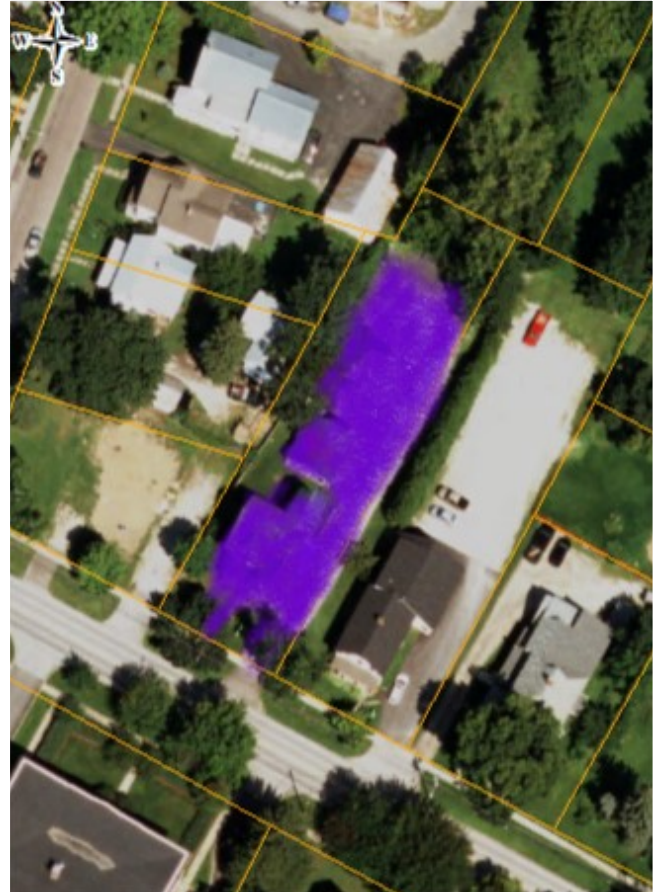


75 Fairfield Street, St. Albans, VT



PART 1: IDENTIFY YOUR PROPERTY FEATURES

Activity 2: Calculate the amount of impervious & pervious surface on your property



1. Based on your identification of property features, use the aerial photo of your property to **color in the impervious surfaces**.
2. Make a ballpark estimate of the amount of impervious surface on your property.

**In the example above, a ballpark estimate is 75%
of 75 Fairfield Street acts as impervious surface.**



PART 1: IDENTIFY YOUR PROPERTY FEATURES

Want to be more exact and measure out your features?

Check out the [supplemental exercise using the ANR Atlas](#)

Use table below to record the area of each property feature:

Feature Type	Feature	Area (ft ²)

Total Built or Impervious Area (ft²) = _____

Total Landscaped Area (ft²) = _____

Total Natural Vegetated Area (ft²) = _____

Percent Impervious _____ Percent Pervious _____



PART 2: ESTIMATE INDIVIDUAL IMPACT

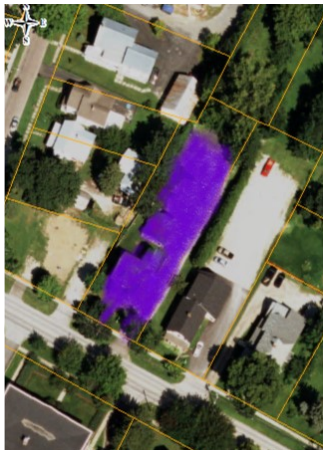
Learning Objectives:

- ♦ Estimate the amount of stormwater that is created on your property during a **1" rainstorm**
- ♦ Learn about the average annual and monthly rainfall & snowfall in Franklin County by using an online resource

Lesson 2: The amount of stormwater runoff generated from your property depends on how long and how hard it rains, the slope of your property, the type and quality of the soils, the amount of impervious surface on your property, and other factors. You can estimate the volume of stormwater generated from a typical rainstorm (about 1") on your property by using the following formula.

$$\text{Stormwater Volume (gallons)} = (\text{Total Impervious Area, ft}^2) \times 0.0833 \times 7.488$$

0.0833 feet is one inch and 7.48 gallons are in a cubic foot



Example Property: 75 Fairfield Street

The following is the amount of stormwater generated at 75 Fairfield Street property:

$$\text{Stormwater Volume} = (10,890 \text{ ft}^2) \times 0.0833 \times 7.488 = 6,792.64 \text{ gallons}$$

This property could generate **6,792.64 gallons of runoff** from a **1" rainstorm**.



6,792.64 gallons is enough water to fill a School Bus three-quarters full!

The size of a typical school bus is 30ft x 7.5ft x 6ft 4in, which equates to a volume of around **9,131 gallons** (including the seats).



PART 2: ESTIMATE INDIVIDUAL IMPACT

How much stormwater does your property generate?

Stormwater Volume (gallons) = _____ (ft²) x 0.0833 x 7.488
Impervious Area on Your Property

To put this further into perspective, the average annual rainfall in St. Albans, VT is 37.68" and the average annual snowfall is 80.6". These amounts of rainfall and snow have the ability to generate a significant amount of stormwater on residential properties and throughout our community.

St. Albans, Vermont Climatology Report on National Oceanic & Atmospheric Administration 1981-2010

St. Albans, VT	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average High Temperature	25.1	28.6	37.8	53.0	65.7	74.5	78.7	77.1	68.8	55.4	43.7	31.6	53.5
Average Low Temperature	6.4	9.1	19.1	33.2	45.2	55.0	59.9	57.5	49.2	38.1	28.5	15.2	34.8
Average Mean Temperature	15.8	18.9	28.4	43.1	55.4	64.7	69.3	67.3	59.0	46.8	36.1	23.4	44.1
Record High Temperature	64	63	80	88	92	96	98	99	95	86	74	66	99
Record Low Temperature	-32	-30	-37	6	25	31	38	36	23	18	-6	-36	-37
Average Days Above 90 Degrees	0	0	0	0	0	1	1	0	0	0	0	0	2
Average Days Below 32 Degrees	30	27	28	14	1	0	0	0	1	8	20	29	157
Average Days Below 0 Degrees	11	7	2	0	0	0	0	0	0	0	0	5	25
Average Rainfall	2.10	1.96	2.65	3.06	3.23	3.73	3.82	3.92	3.58	3.62	3.33	2.68	37.68
Record Rainfall	6.04	4.43	6.60	6.59	8.30	6.69	6.83	8.61	8.30	7.28	7.25	5.22	48.41
Average Number of Rain Days	13	10	12	12	13	12	12	11	10	12	12	13	143
Average Snowfall	17.3	17.6	14.8	5.8	0.1	0	0	0	0	0.7	6.2	18.1	80.6
Record Snowfall	52.8	38.5	40.0	24.8	2.0	0	0	0	0	4.0	28.0	47.5	121.0
Average Number of Snow Days	11	9	7	3	0	0	0	0	0	1	4	10	44
Average Heating Degree Days	1527	1292	1133	658	313	90	23	46	211	567	867	1290	8017
Average Cooling Degree Days	0	0	0	1	17	82	156	118	31	2	0	0	406
Station Information	Elevation: 460 ft / Latitude: 44.8592 / Longitude: -73.0911												
Temperatures are reported in Fahrenheit and rainfall/snowfall totals are reported in inches. Averages are for the period 1981-2010 (Annual totals may be slightly different than monthly totals due to rounding)													



PART 3: MAP THE FLOW OF WATER

Learning Objectives:

- ◆ Learn about where stormwater could flow and collect on your property.
- ◆ Identify areas on your property where you experience standing water or water is up against structures (basement, garage, etc).

The next step is to show where stormwater collects and flows on your property and identify the source of the water. This information will help you identify where on your property you could locate a stormwater best practice.

Common stormwater problems may include large puddles (“ponding”), damp basements, soil erosion, and collapsing stream banks. The ideal time to assess stormwater flow would be during or immediately after a rain storm.

Activity 3: Homeowner Property Assessment Questionnaire

- ◆ Identify the materials each impervious surface on property (i.e. asphalt, slate, brick, stones, dirt, and etc.)

Roof _____

Driveway _____

Walkway _____

Deck/Porch _____

Other _____

- ◆ Does the home have gutters?

Fully Guttered

Partially Guttered

Not Guttered

If Guttered, how many gutter downspouts are there and where are they directed ? Indicate on property map.



- ◆ Where does the water ultimately flow (i.e. area in yard, driveway, into the street)?

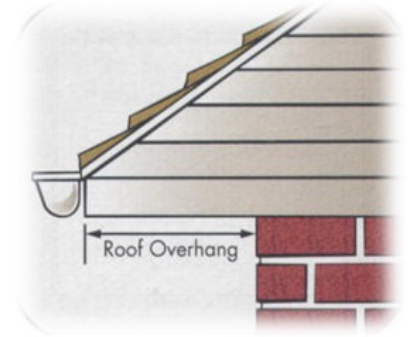


PART 3: MAP THE FLOW OF WATER

Homeowner Property Assessment Questionnaire

◆ Does your home have a roof overhang? Yes No

◆ If yes, what does the water drain into (i.e. gutters, rain barrel, rock trench, or just the grass) and indicate where on aerial map.



◆ Is there evidence of driveway erosion? Yes No

If yes, explain and indicate on property map:



◆ How is water shed (sheet flow or channelized) from walkways and other impervious surfaces?



Where does this water ultimately flow? _____

◆ Do you have any issues with water entering your basement and/or garage? Yes No

If yes, indicate where and how often:





PART 3: MAP THE FLOW OF WATER

Homeowner Property Assessment Questionnaire

◆ Do you have ponding or standing water on areas of your property? Yes No

If so, where (indicate on a property map):



◆ Are there seasonally saturated areas on the property? Yes No
Describe: _____

◆ What type of topographic features do you have on your property? Steep slopes, low spots, hills, bedrock, and vulnerable areas? Explain.



◆ Are there swales or other conveyance structures on site? Yes No

If yes, describe condition and surface (vegetated, paved, perforated pipe, etc).



PART 3: MAP THE FLOW OF WATER

Homeowner Property Assessment Questionnaire

- ◆ Are there storm drains in close proximity where site water is flowing to? Yes No

If yes, indicate location on aerial map and inspect catch basin for inflow pipes coming from the property. Explain direct connections here:

- ◆ Are there bare areas on site? Yes No

If yes, where? _____

Approximate size of the area ? _____

Explanation of potential cause. _____



- ◆ Are there perennial or vegetable gardens on site? Yes No

Describe: _____

- ◆ Are there trees or shrubs on site? Yes No

Describe: _____



PART 3: MAP THE FLOW OF WATER

Homeowner Property Assessment Questionnaire

- ◆ Do you have a waterbody on or along your property? Yes No
If yes, indicate where on a property map (i.e. stream, pond, lake, etc.).

Is the waterbody buffered by vegetation? Yes No

Does stormwater flow to the waterbody(s)? Yes No

If yes, is there visible erosion on the banks?

Describe. _____

- ◆ Any evidence of stormwater “run-on” from adjacent properties? Yes No

If yes, explain: _____

- ◆ Are there stormwater best management practices currently on your property?
Yes No

If yes, indicate on aerial map and explain: _____

- ◆ Are you in a sewer service area or do you have a septic system? _____

If a septic system, where is the leach field located?

- ◆ Are you in a water service area or do you have a well/spring? _____

If well or spring, where is it located?



NOTES & REFLECTIONS:



PART 3: MAP THE FLOW OF WATER

Activity 4: Assess and map your stormwater flow.

Using an aerial map or drawing of your property, spend some time considering how water flows on your property. This is best done during or immediately after a rain event.

Look for and map the following:

Stormwater flow paths - Using arrows, show the direction of stormwater flow off of impervious surfaces. If you have any areas where stormwater collects, such as drainage swales or ditches, show this and label them as such.

Roof downspouts - Indicate the location and direction stormwater flows from the downspouts.

Roof overhangs – Identify which side of your structure these drain to and where the water goes once it hits the ground.

Areas of ponding - Indicate locations of standing water or ponding on the map.

Gullies or ditches from soil erosion - Indicate any areas of soil erosion which have resulted in gullies or ditches.

The symbols below can be used to mark features on your property.

	Directional flow		Stream/river		Swale
	Standing water		Well		Erosion
	Downspout		Spring		Culvert
	Gutter		Wetland		Significant slope



PART 3: MAP THE FLOW OF WATER

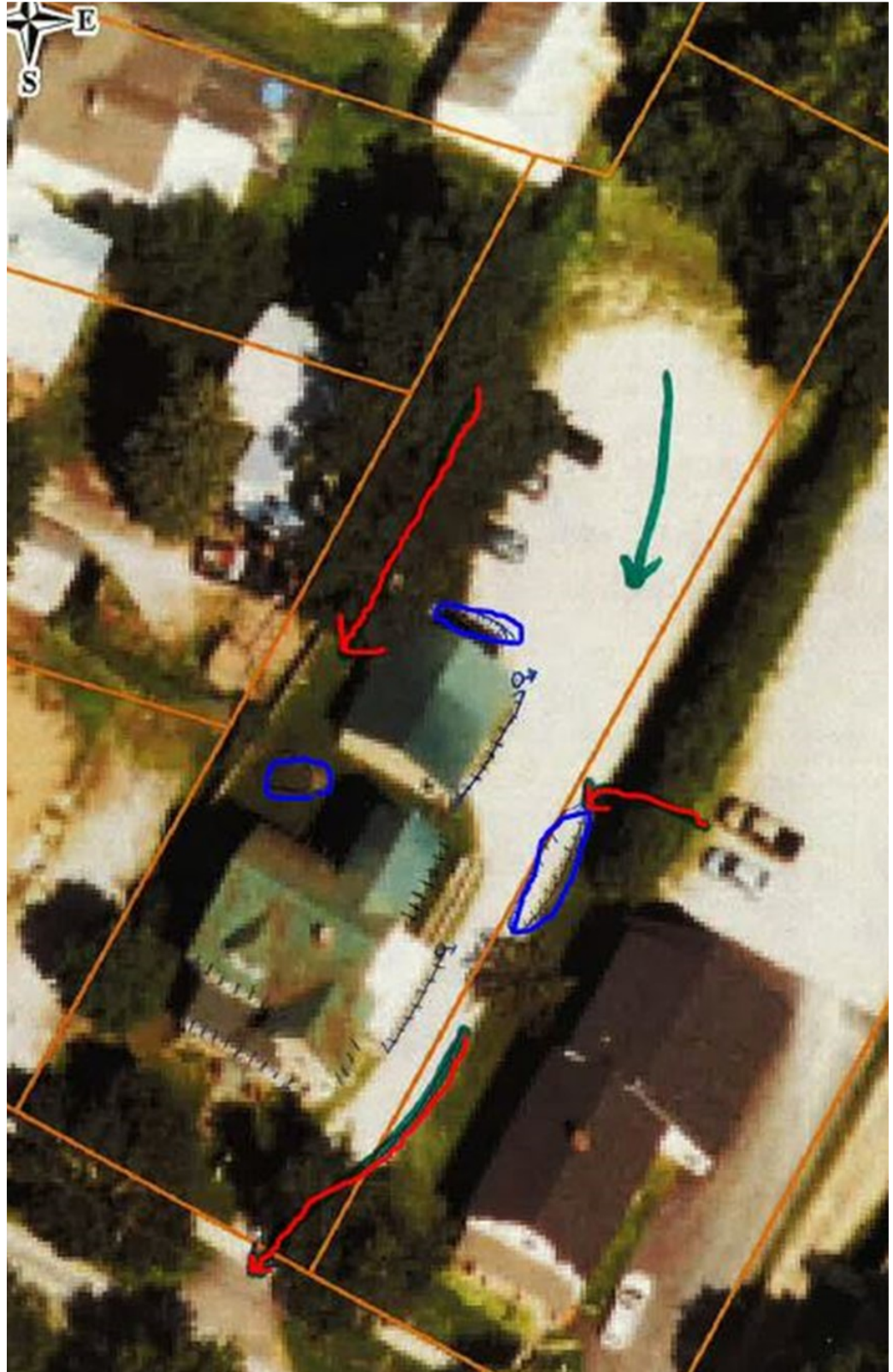
Directions: Use arrows to show the location and direction of flow. Use symbols to mark features on your property.

75 Fairfield Street – Flow Map

Arrows show
direction of
flow

Blue Circles
show areas
where water
ponds

Cross hatched
sections of roof
with gutters





PART 4: EVALUATING SOIL SUITABILITY

Learning Objectives:

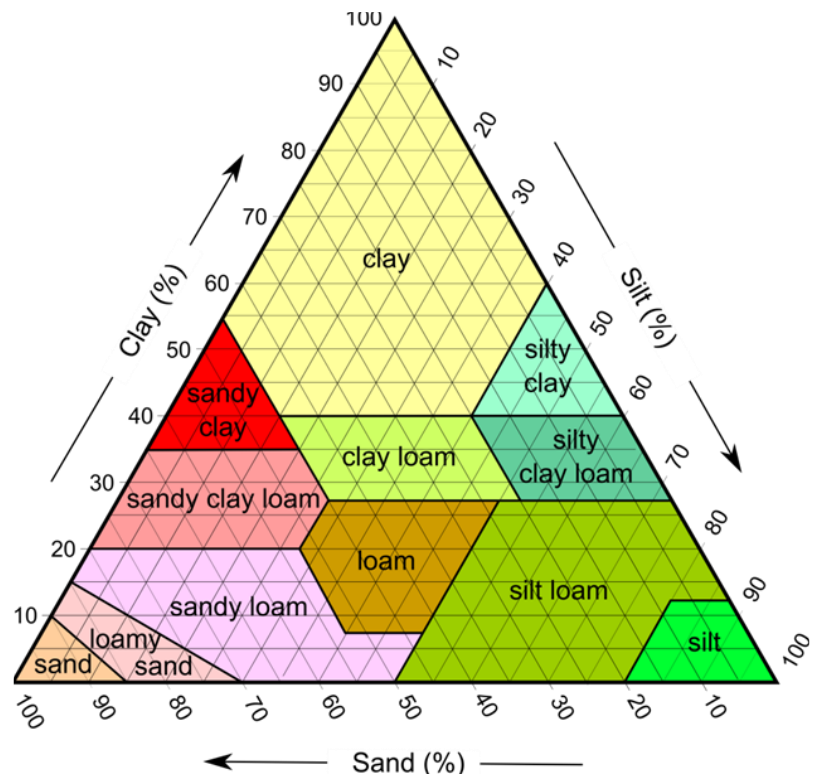
1. Identify the type of soil on your property
2. Measure how well your land infiltrates water

Understanding the type of soil on your property will aid you in identifying the types of stormwater practices that will be a good fit for your site.

SOIL TEXTURE:

A first step to evaluating soil suitability is to have a general understanding of the 3 basic soil texture types:

- ♦ Sand
- ♦ Silt
- ♦ Clay



There are online resources available that can give you an idea of what your soil type is. However, when your property was developed, soil (or fill) may have been brought onto your property in order to improve its conditions. Therefore it is a good idea to do a percolation and ribbon test (see handout) to test the soil.

You can get a general idea of your soil type by looking at the Franklin County soil survey

USDA Natural Resources Conservation Service, <http://websoilsurvey.nrcs.usda.gov>

To find out about the type and quality of your soils go to the Web Soil Survey (WSS), an online interactive map.





PART 4: EVALUATING SOIL SUITABILITY

The texture of a soil has an influence on how well that soil will drain. Sandy soils drain faster than clay soils.



***Additional information on soil is provided in the
Homeowner Supplement: Evaluating Soil Suitability***

Take-home Activity - Soil Texture test

Try compressing a ball of soil into a ball or make a “soil ribbon” to determine which is sand, silt loam, or clay.

Take-home Activity - Soil Percolation Test

A soil percolation test is conducted to determine how quickly water will infiltrate at a site. Areas with good drainage are candidates for installing a practice that directs water to that area. See handout with links to videos on how to conduct a simple percolation test.

NOTES & REFLECTIONS: