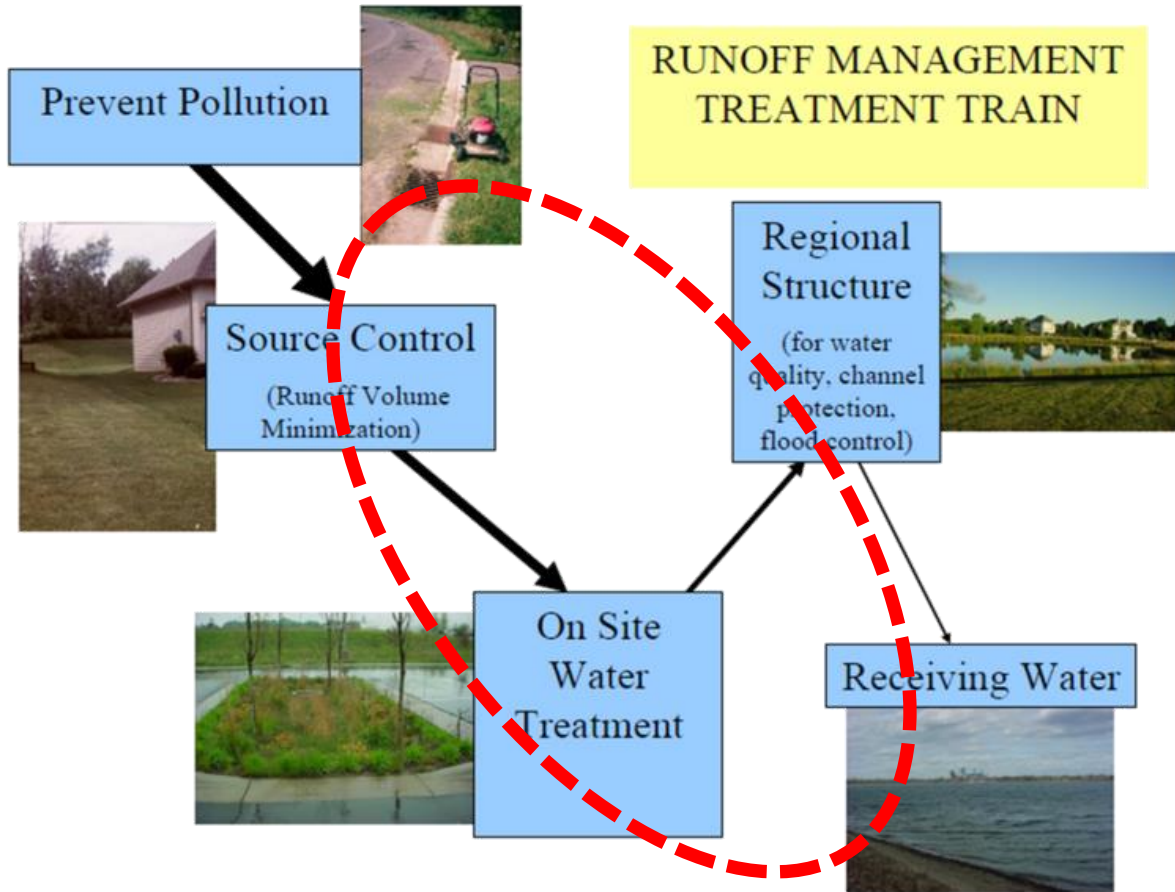


Source control and On-site Water Treatment

So, what comes next in order of effectiveness after BMPs that prevent pollution?

Source control and on-site water treatment BMPs are considered the next best options after pollution prevention strategies. Both of these depend heavily on having good soils.



What is a good soil? And why do we need good soil for infiltration?

Looking at healthy soil in cross section reveals layers of materials of varying depths. These are typically referred to by a capital letter, as you see in the diagram. In general, the layers are:

O- Organic matter

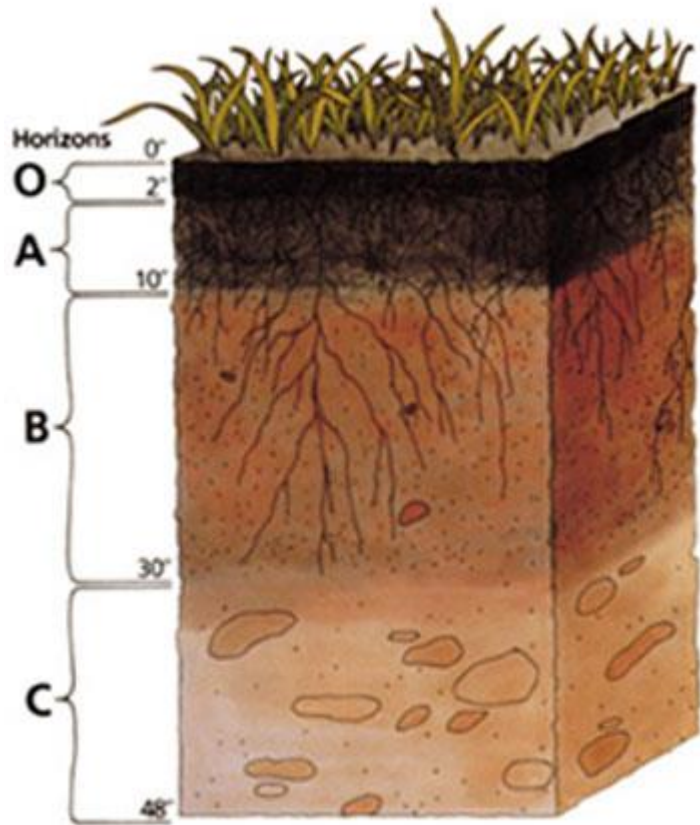
A- Surface soil

B- Subsoil

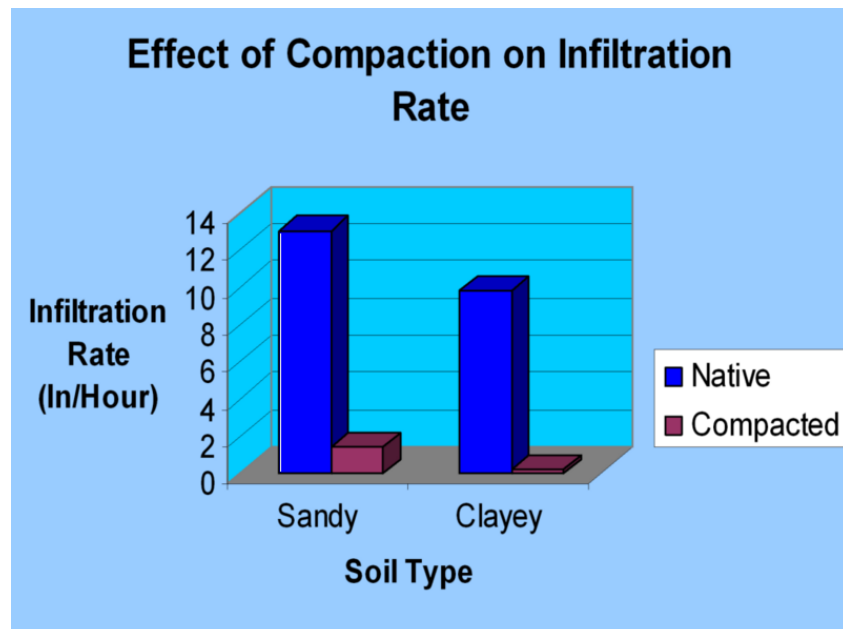
C- Parent rock

And if you dig way down you will come to:

R- Bedrock



Healthy soils contain organic matter, nutrients, microbial populations, are made up of a particles of different sizes that create spaces to hold water, and are loose and not compacted. The more compacted the soil is, the less able the soil is to infiltrate water.



If your soils are not healthy, you need to improve them before you can employ source control BMPs. If we have poor soils, then we can restore, remediate and correct by soil ripping, soil tilling and amending with compost.



Now that your soils have been improved, let's look at the options for source control BMPs

Permeable Pavement-

On the surface, Permeable Pavement looks very similar to other sorts of paved surfaces.



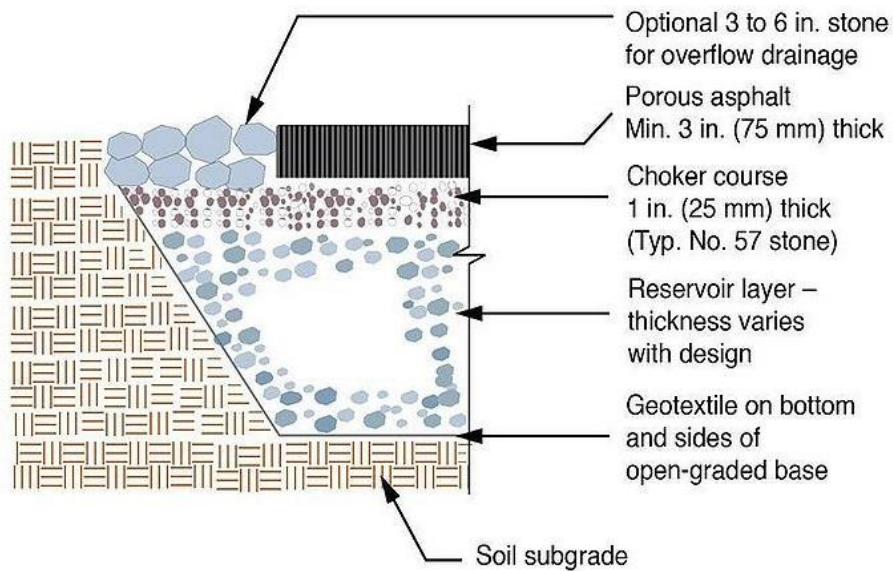
The difference is what is under the pavement.

Purpose = Reduce runoff (volume)

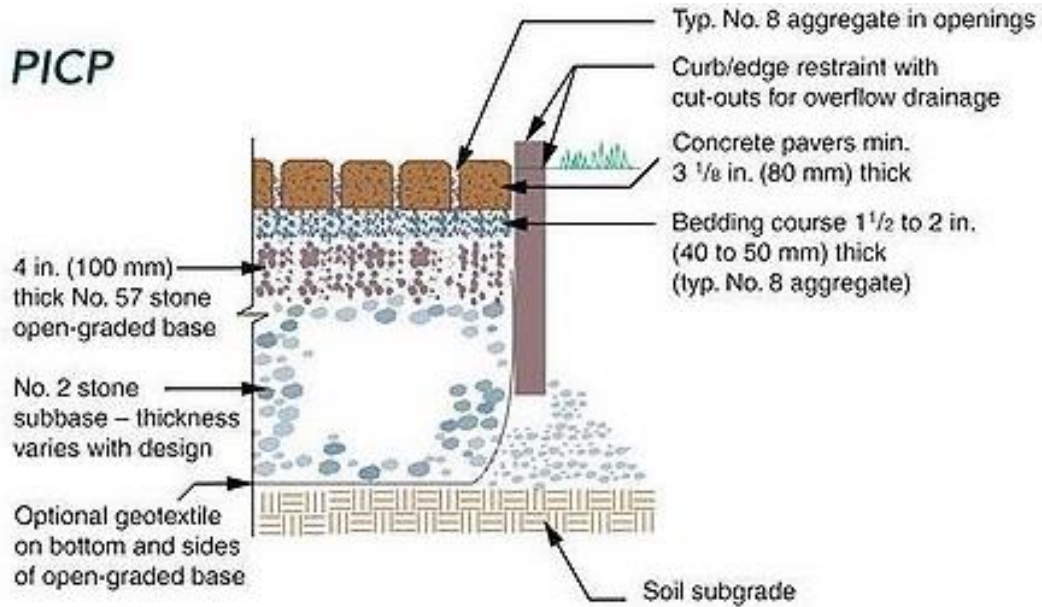
Function = allows stormwater runoff to filter through surface voids into an underlying stone reservoir for temporary storage and/or infiltration.

There are a variety of permeable pavement options-

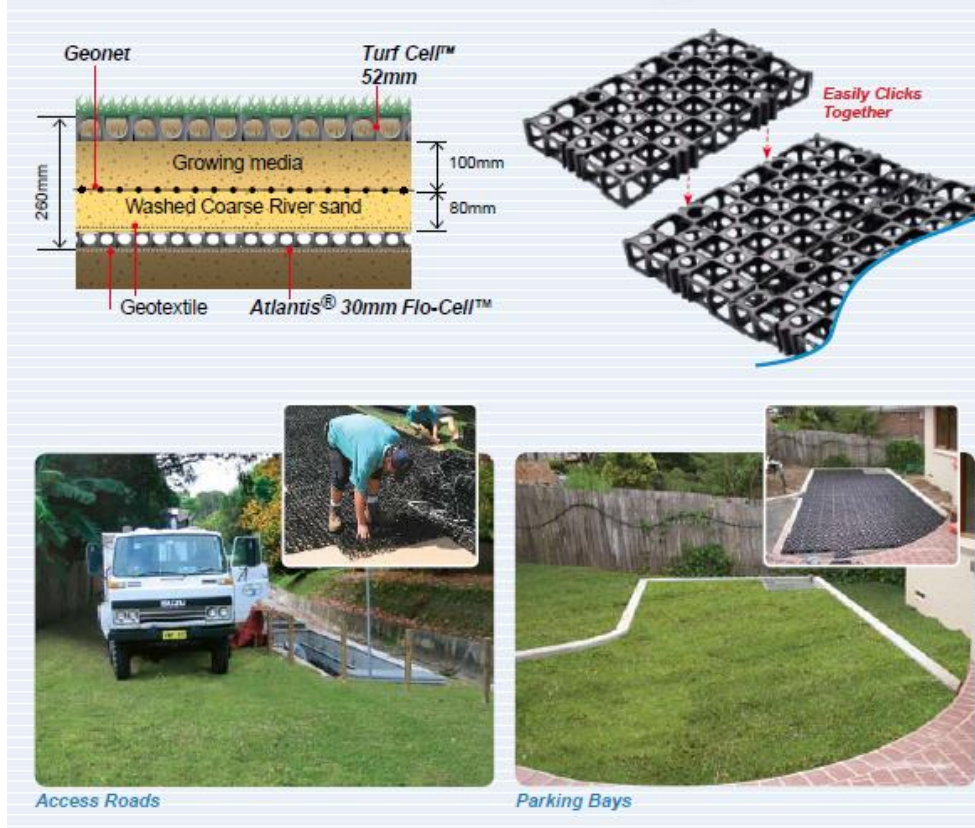
- Pervious Asphalt
- Pervious Concrete



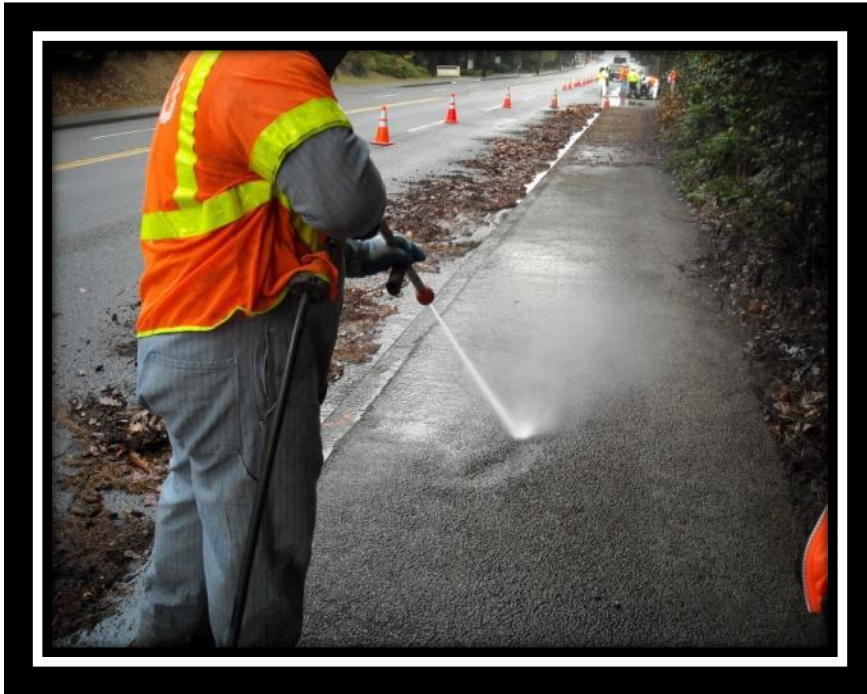
- Pervious Pavers



- Grass Structures



And like anything else we will need to maintain all of these BMPs



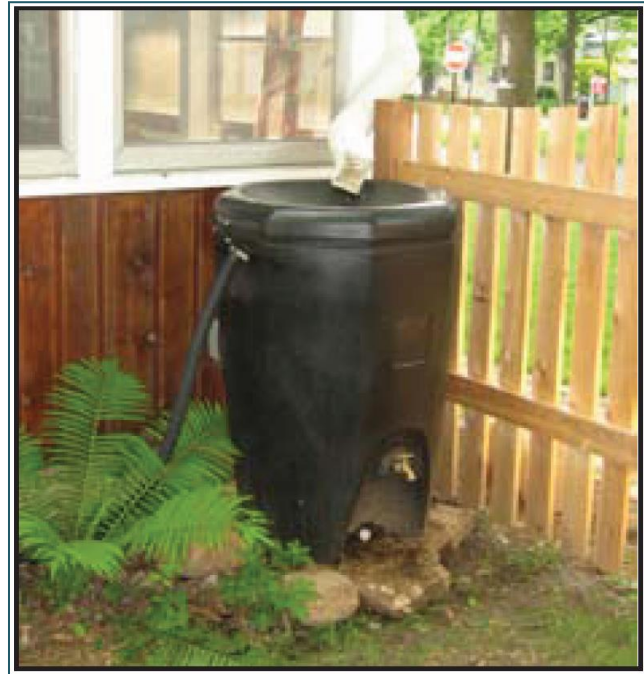
The fine particles that settle on the surface of the pavement will eventually build up and clog the pores of the permeable surface. Water won't infiltrate properly.

In this photo, the man is washing the sediment off a permeable surface to open up the pores.



Rainwater Harvesting

Rainwater harvesting can be considered a pollution prevention BMP, but it can also be thought of as a source control, because we are capturing and controlling the rain right on site.

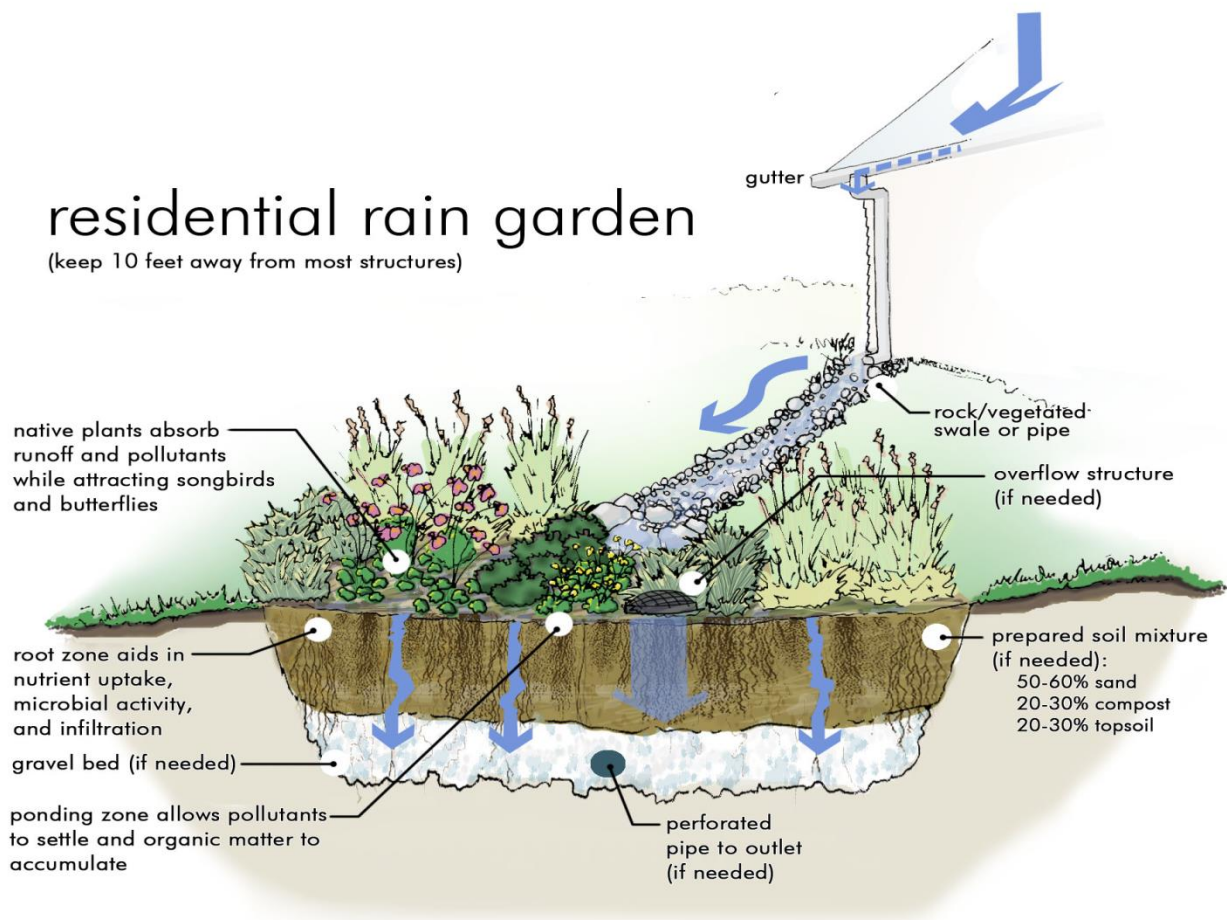


Bioretention

A raingarden is an example of a bioretention BMP.

Purpose = Reduce runoff (volume)

Function = A terrestrial (*above water table*) stormwater treatment practice that provides opportunity for runoff infiltration, filtration, storage, and water uptake (loss) by vegetation through interception and plant growth.



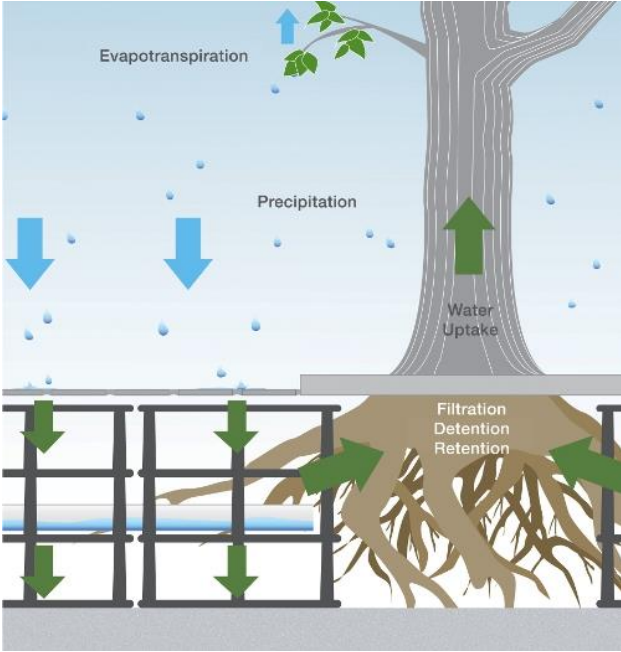
Above is a simplified engineering diagram. It is generally not a complicated technical project, and certainly within the capability of most residential property owners to build. This is a fairly common project for Master Water Steward capstone projects. This type of BMP falls under both the Pollution Prevention and Source Control BMPs, because it captures and treats the rain right on site.



In a gentle rain you should see no surface water, because all is being soaked up by the rain garden.



Another example of an infiltration BMP: tree trenches. these are really the same idea as a rain garden—but now we use trees for our vegetation. Like the permeable pavements, the critical component of a tree trench is what is below the surface. In the case of a tree trench, the soil is amended to improve permeability and reduce compaction, so the tree has plenty of room for deep, healthy root systems.



What if we put these raingardens on our roofs, then we have green roofs!

Purpose = Reduce runoff quantity, rate, and improve water quality

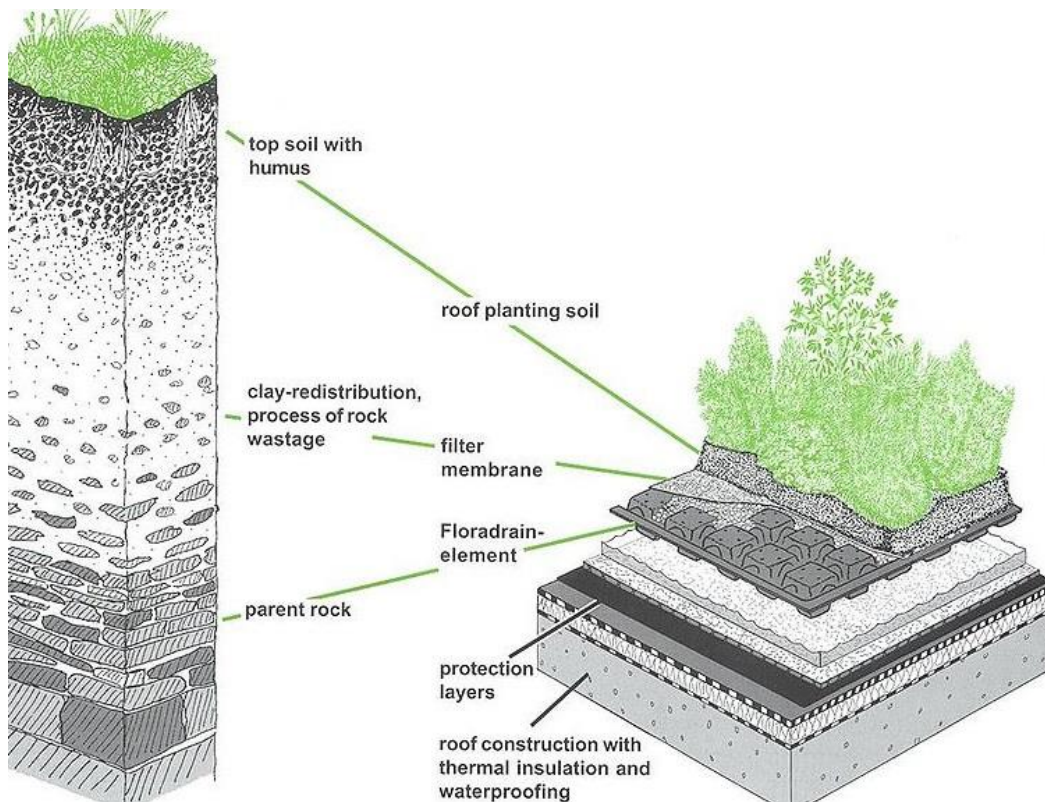
Function = filtering of suspended solids and pollutants associated with those solids



Learning Activity

Read about the capacity and function of the green roof on the Target Center-

<http://www.greenroofs.com/projects/pview.php?id=1000>



A garden growing up the side of a building gives us a green wall.

All of these BMPs help control the source and volume of water running off a site.

