

Wastewater Treatment

Treatment depends on three factors:

- 1) Slow water down - removes larger particles
- 2) Aerobic decomposition of organic material
- 3) Destroy pathogens (disease causing bacteria)

Natural Stream systems self-purify

Slow Down – meander (winding),
rocks and woody debris in stream,
good riparian zone

Aerobic Decomposition – natural
bacteria decompose organic material
IF enough dissolved oxygen is present
in the water



**Treatment of Urban
Drinking Water and
Wastewater is designed
to mimic the natural self-
purification of streams.**



KY-AM Water and LFUCG Wastewater Plants

**Extensive impervious
surfaces of Lexington**



Town Branch Wastewater Treatment Plant

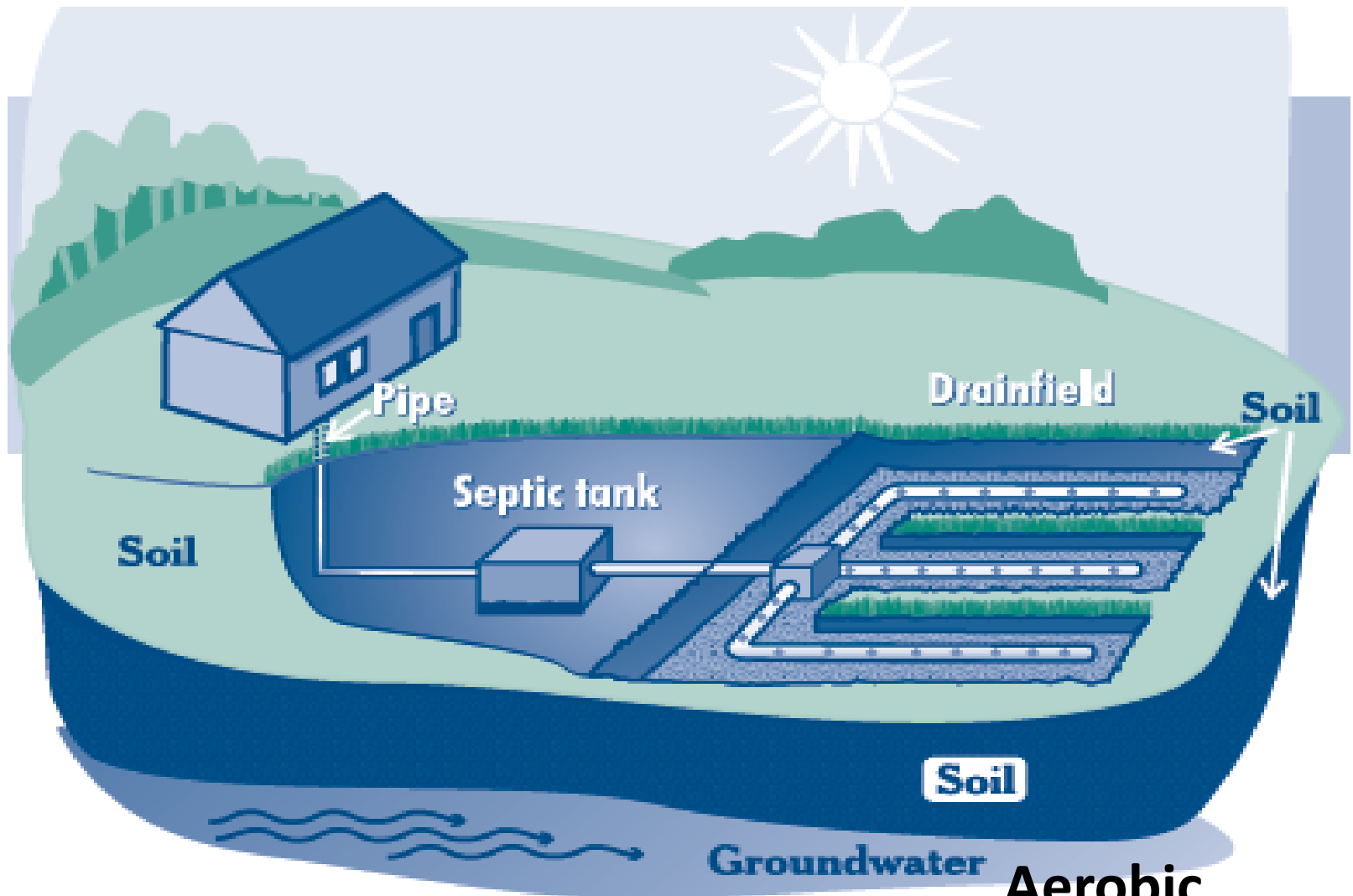


W. Hickman Wastewater Treatment Plant



KY-AM Water Treatment Plant



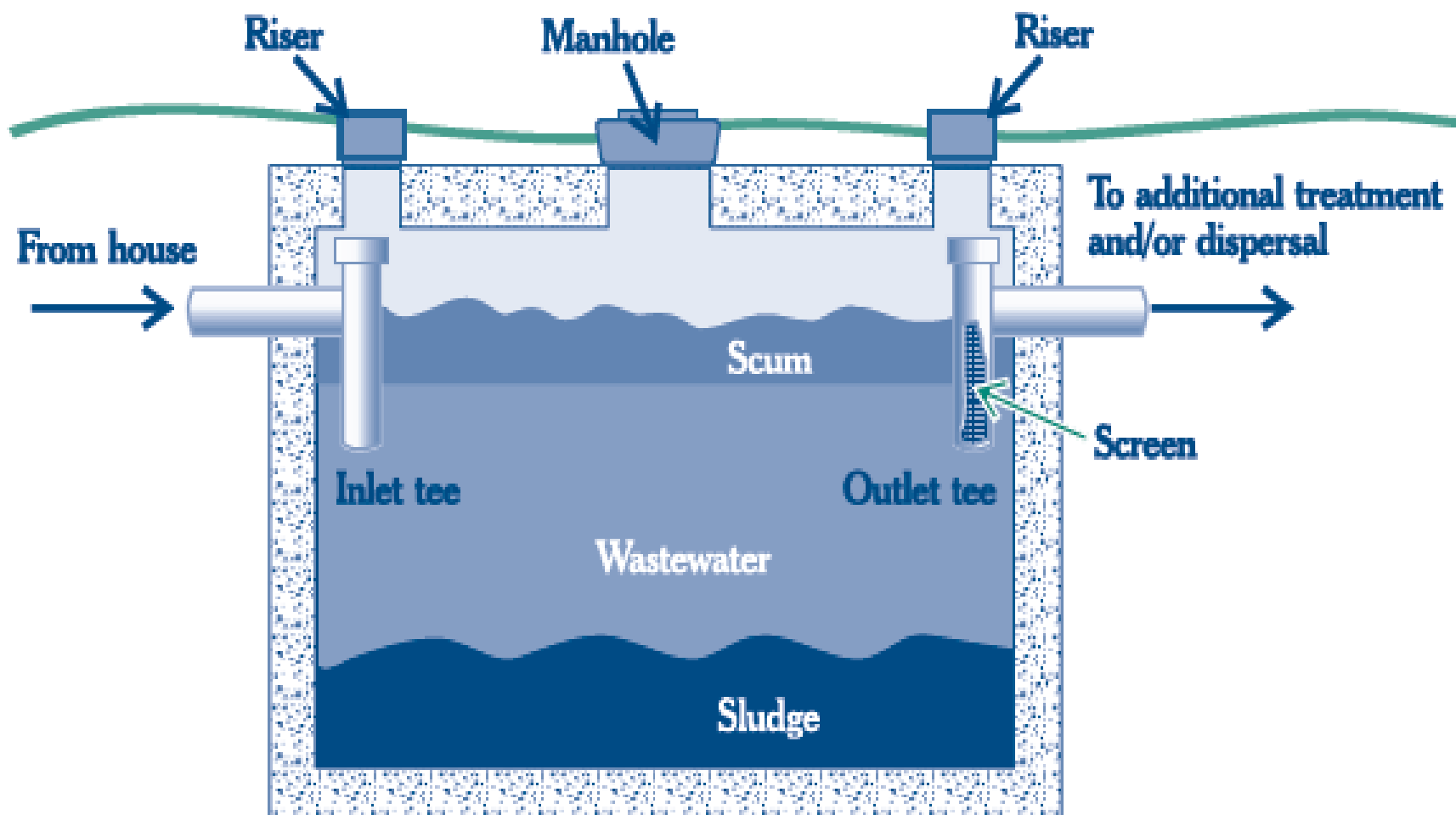


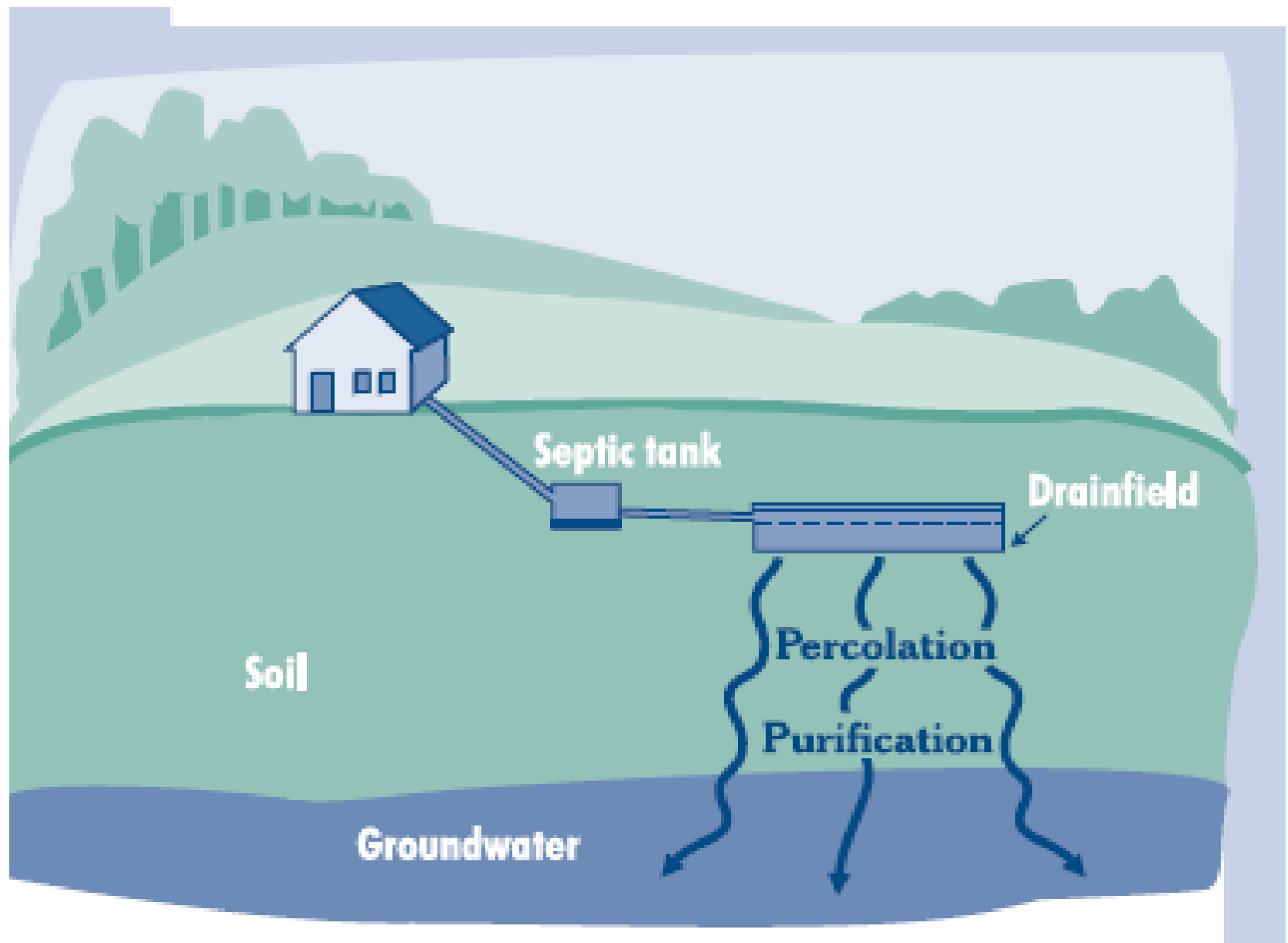
Typical septic system

**Aerobic
decomposition
in soil**

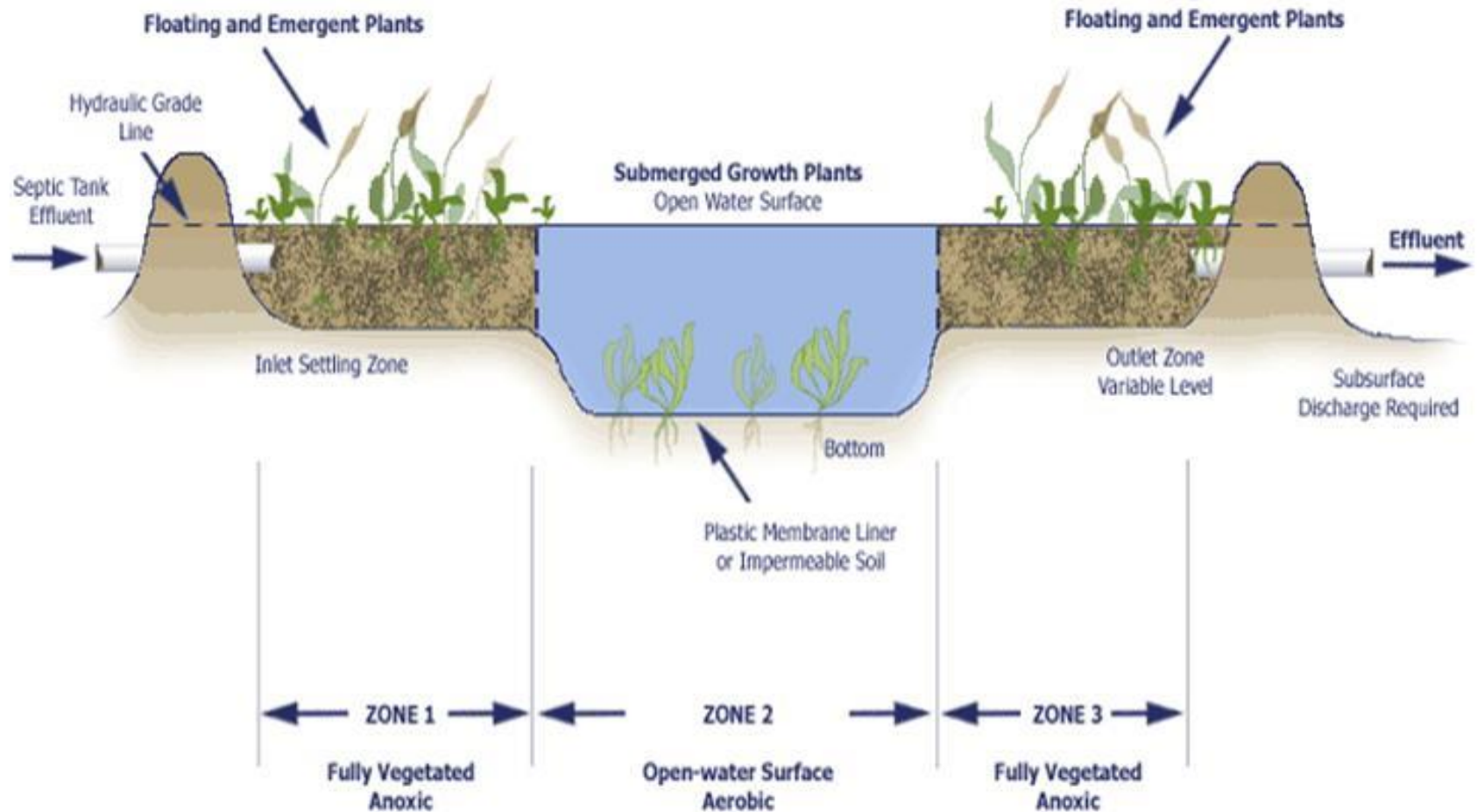
Typical single-compartment septic tank with ground-level inspection risers and screen

Slow, settle and separate





Constructed Wetland Sewage Treatment



During heavy rain events, decreasing the amount of water in the storm sewer system (and sanitary sewers) is very beneficial to the health of streams in our community.

Rain barrels and Rain Gardens



Permeable Pavement

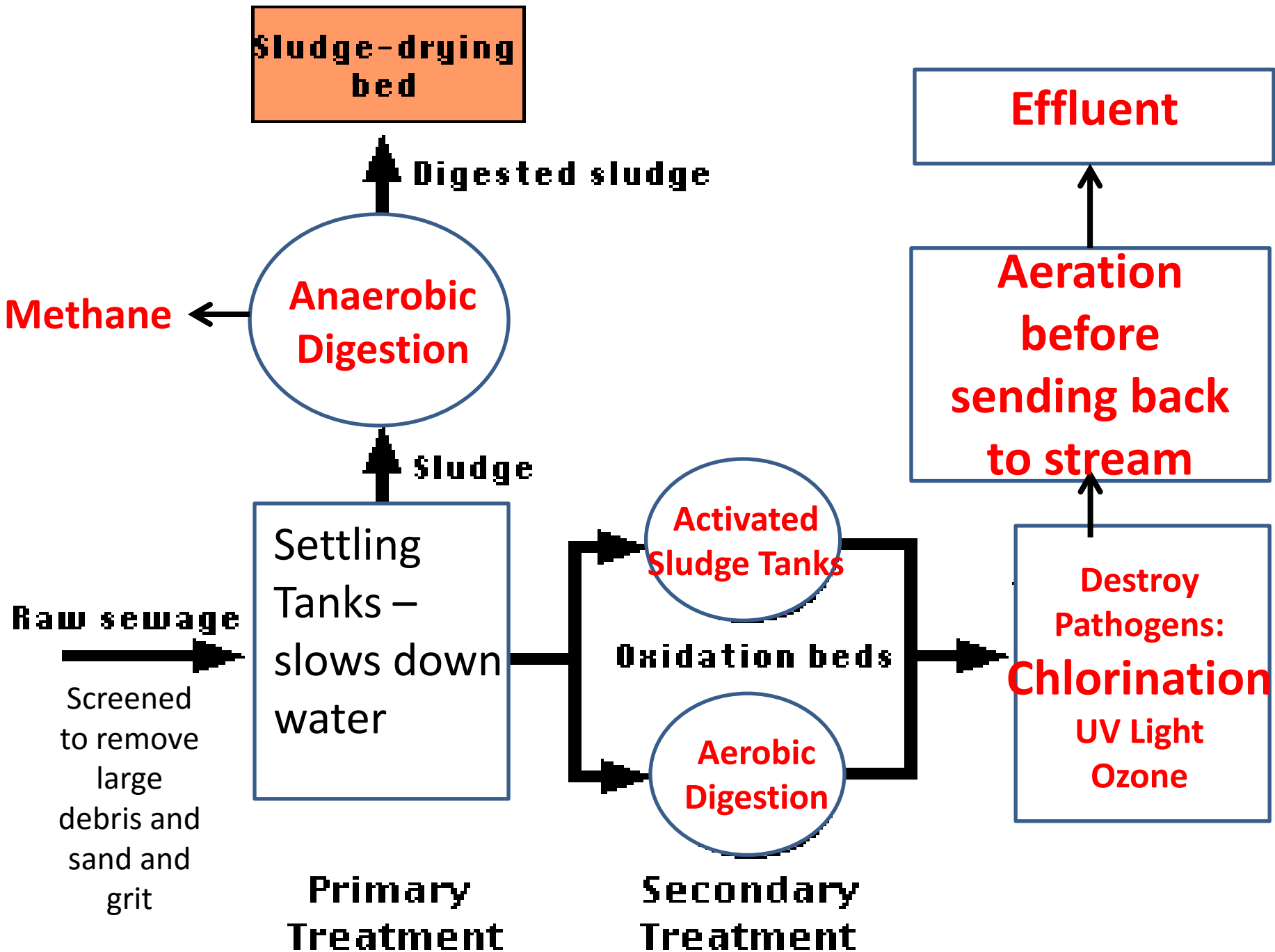


Detention Basins



Stormwater Wetlands, Stream Restoration and Riparian Resoration

Wastewater Treatment









**Aeration and
Chlorination**

Effluent

**Activated
Sludge Tanks**

**Primary
Settling Tanks**

Water Treatment

Water Treatment

- 1) Water pumped from river
- 2) Goes into settling tanks – removes sand, silt and clay (chemicals may be added to help clump particles)
- 3) Clearwater flows over activated charcoal, gravel and sand filters
- 4) Ammonium Chloride added to kill pathogens



Chemical Tests for Water Quality

Temperature: affects D.O. – higher, less D.O.

pH: Measures if water is acidic or basic – most living things need to be near neutral

Conductivity: Measures the dissolved ions in the water – not what is there, but how much.

Dissolved Oxygen (D.O.): Measures the amount in ppm – best if around 8 – 12 ppm for most living things

Other Tests?

Nitrates and Phosphates: found in fertilizers

Turbidity: Measures amount of suspended particles – streams usually turbid after heavy rains, but clear up as water slows down. Good for ponds and lakes.

Bacteria Tests: Good but not easy to do