



# Water Quality in NC



# Types of Pollution

Sediments

erosion, soil

Oxygen Demanding  
Agents

organic waste and  
manure

Toxic Metals

acids, toxic metals

Inorganic Plant  
Nutrients

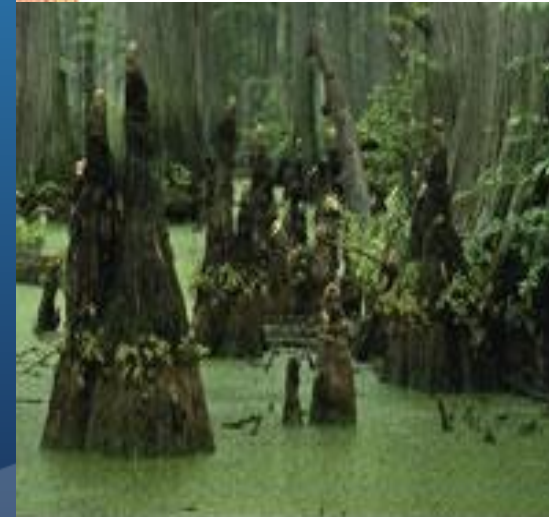
nitrogen and phosphorus

Organic Chemicals

oil, detergents,  
pesticides

# Biological Oxygen Demanding (BOD) Agents (I NEED AIR)

- BOD: Oxygen is removed from water by bacteria
- Fish can't live in streams without oxygen
- Where to find BOD at its highest?
  - Swamps
  - Runoff from agriculture



# BOD Effects on Water Quality

All streams have some ability to breakdown organic waste. Problems occur when a stream is overloaded with organic waste.

High Pollution:    High BOD  
                                 Low Dissolved Oxygen

Low Pollution:    Low BOD  
                                 High Dissolved Oxygen

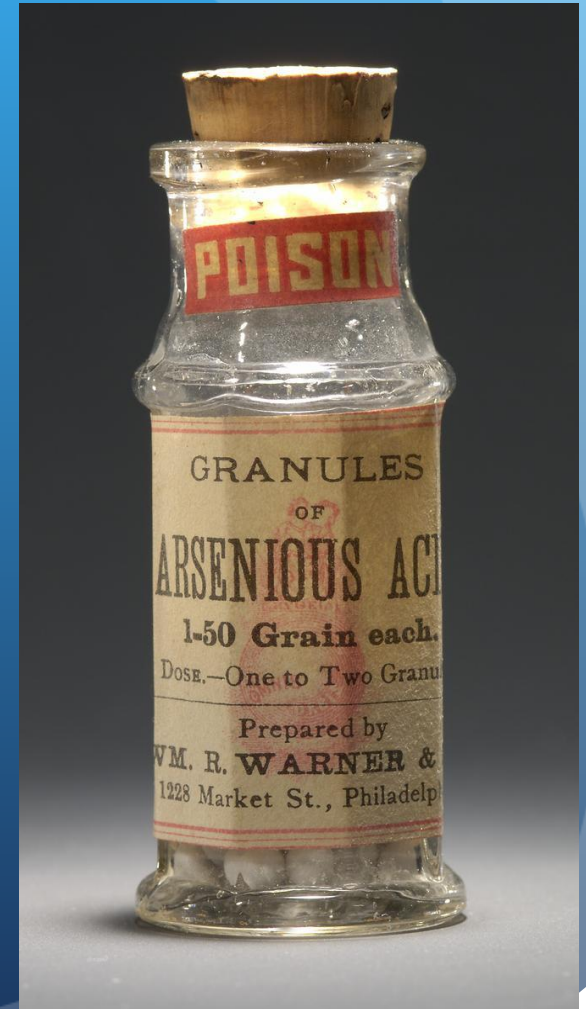
# Toxic Metals

- Toxic metals that can be absorbed by plants or animal tissues
- Bioaccumulation: toxins increase in amounts as you move up the trophic levels.
- Examples
  - Arsenic
  - Lead
  - Mercury
  - Cadmium



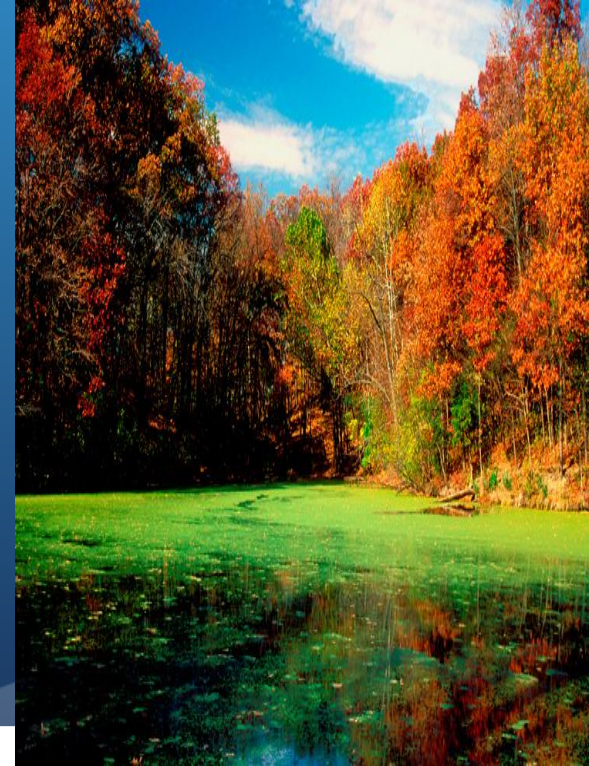
# Case Study: Arsenic in Groundwater - a Natural Threat

- Toxic Arsenic (As) can naturally occur at high levels in soil and rocks.
- Drilling into aquifers can release Arsenic into drinking water supplies.



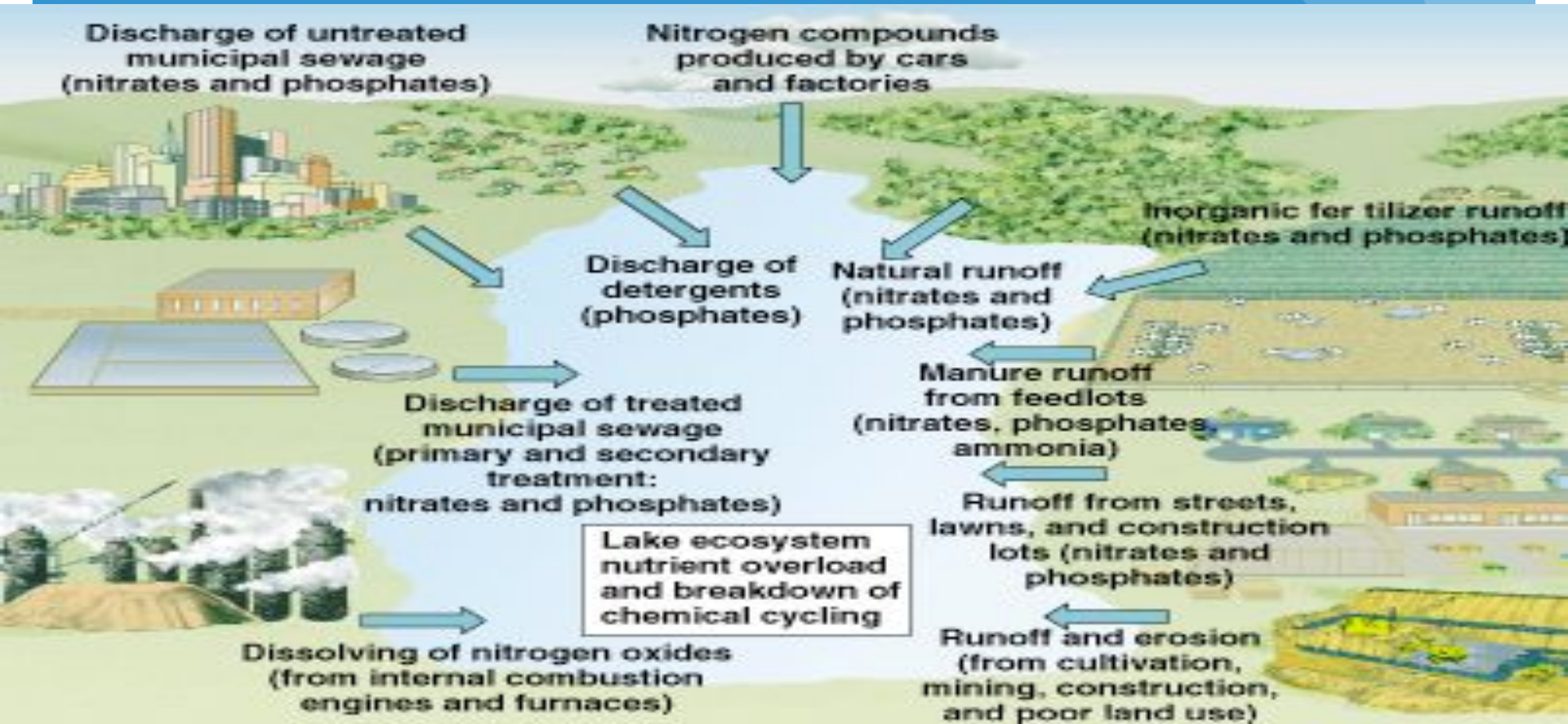
# Inorganic Plant Nutrients: Nitrogen and Phosphorus

- Sources:
  - Human, animal (e.g., Hog Farms), and industrial waste
  - Storm water
  - Soil erosion
  - Excessive use of fertilizers for crops, lawns, and home



# Eutrophication

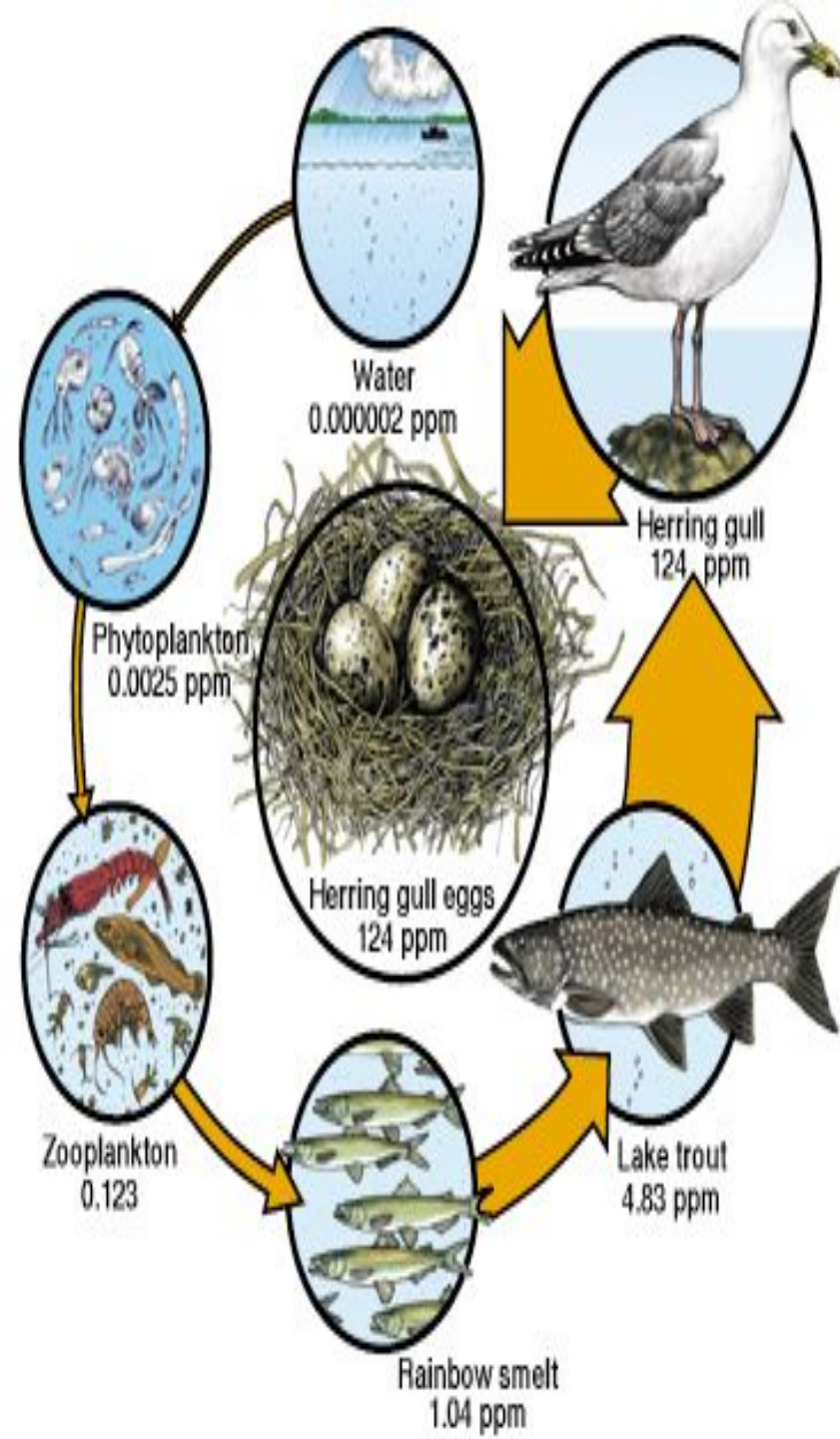
**Eutrophication** is a growth of algae bloom in water and is an accelerated results with human input of nutrients to a lake





# Organic Chemicals

- Concentrations increase at increasing levels in the food chain  
- PCBs, DDT, etc.
- Biomagnification



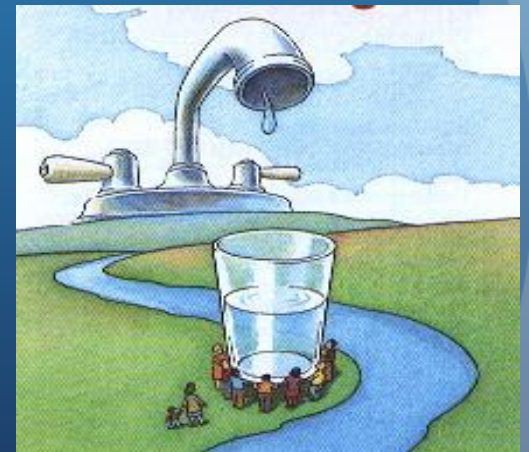
# Sediments

- Sediment (clay, silt) is the #1 source of water pollution.
- Clouds the water
- Blocks sunlight for the aquatic plants causing them to die



# Drinking Water Quality

- Drinking water (Potable Water) is purified by
  - storage in reservoir  
(suspended matter settles)
  - treated by sand filters
  - activated charcoal
  - addition of chlorine

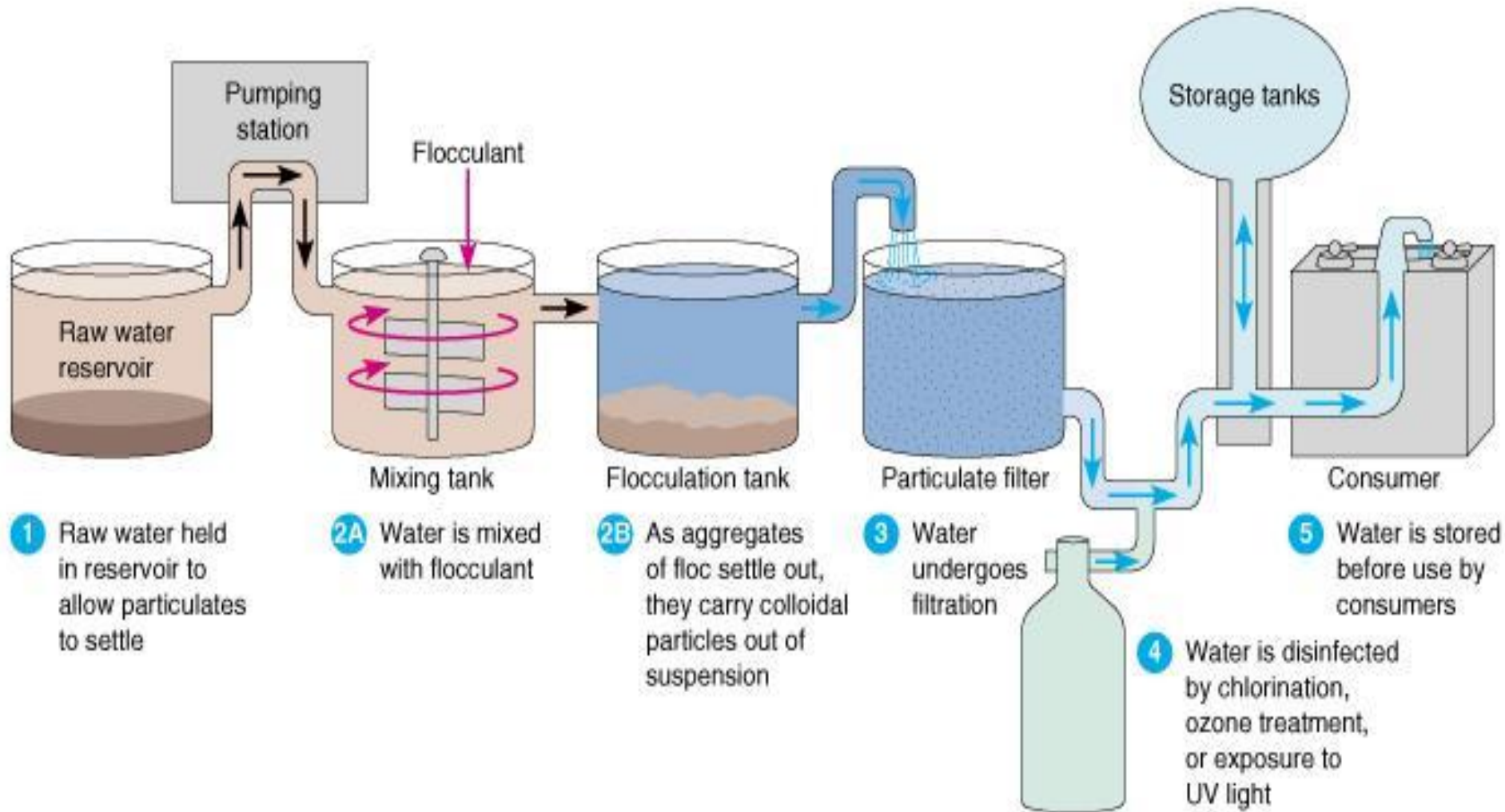


# Water Treatment Stages

Sequence of stages in treating our drinking water:

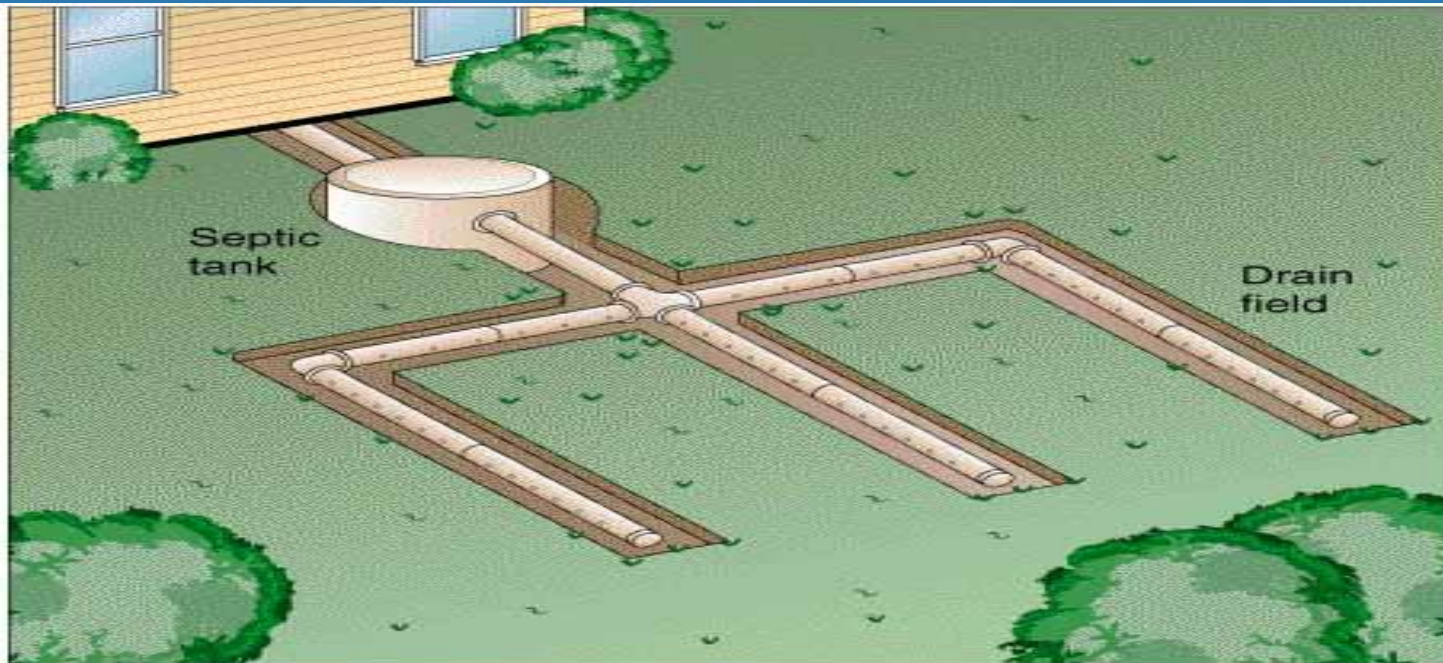
1. Screening
2. Aeration
3. pH correction
4. Flocculation
5. Sedimentation
6. Pre-chlorination
7. Filtration
8. Disinfection
9. pH adjustment

# Municipal Water Purification Plant



# Home Septic Systems

- No Chlorine used
- Uses a settling tank to settle the solids
- Lets waste water percolate into the soil to decompose



# Water Conservation Methods

- Repair leaking faucets and underground pipes
- Landscape year with plants that use little water
- Use drip irrigation in your yard and crops



# Water Conservation Methods

- Use water saving toilets, showerheads, dish washers
- Purify and reuse water for houses and gardens
  - Rain Barrels

