



## HANDOUT #5

### CE4214 Hydrology

Engr. Reynaldo P Ramos, PhD

#### Sources of Water

- Rain or Atmospheric water – this is the most common form of precipitation
- Surface water – a mixture of surface runoff and groundwater such as rivers, streams, ponds, lakes, seas, oceans, impounding reservoirs
- Groundwater – a portion of rainwater which percolated into the earth to form underground deposits called aquifers. Examples are springs, wells, and infiltration galleries

#### Properties of Water

- Physical properties – turbidity, color, odor, taste
- Chemical properties – hardness, alkalinity and acidity (pH), carbon dioxide, dissolved oxygen, chemical oxygen demand, iron and manganese, toxic substances phenolic compounds
- Bacteriological characteristics – pathogens, coliform (fecal) organisms or bacteria, E-coli

#### Relevant Laws and Regulations on Water Quality

- Commonwealth Act #383 – punishment in dumping into rivers of refuse waste matter or substances
- Republic Act #3931 – Creation of the National Water and Air Pollution Control Commission
- Presidential Decree #1067 – Instituting the water code governing ownership, appropriation, utilization, exploitation development, conservation and protection of water resources
- DENR Administrative Order #34 – Revised water usage and classification/water quality criteria
- DENR Administrative Order #35 – Revised effluent regulations, which provides effluent standards for toxic and other deleterious substances and other pollutants in the various categories of protected waters.
- Republic Act 9275 – Philippine Clean Water Act of 2004 which provides mechanisms for the sustainable use, protection and preservation of the water resources in the country.
- Presidential Decree 856 – Code of Sanitation of the Philippines, Chapter II- Water Supply
- Presidential Decree 522 – Implementing rules and regulation for the water supply provisions covering standards and their bacteriological and chemical examinations, including the evaluation of results
- Department of Health (DOH) Administrative Order #447-F of 1991 – Updated of the 1978 National Standards for Drinking Water.
- DOH Administrative Order #31 – Requirements for the accreditation of water analysis laboratories.
- DOH Administrative Order #18-A – Standards of quality and requirements for the processing, packaging, and labeling of bottled drinking water.
- DOH Administrative Order #2007-0012 – Philippine National Standards for Drinking Water 2007, March 9, 2007
- DOH Administrative Order #26-A – Philippine National Standards for Drinking Water 1993
- DENR Administrative 2016-08 – Water Quality Guidelines and General Effluent Standards of 2016, May 24, 2016

#### SUGGESTED READING MATERIAL:

The World Bank Office Manila (2012). *Rural Water Supply Design Manual, Volumes 1-3*, Water Partnership Program, Manila, Philippines: World Bank.