Lec.6 Ground Water Pollution 4th class

**Hydrogeologic Site Investigations**

The purpose of hydrogeologic site investigations is to characterize soil and ground water pollution problems in sufficient detail to facilitate design of a cost-effective corrective action program. For this purpose, the site investigation entails measurement of the physical parameters that control subsurface contaminant transport at a given site. Geologic, hydrologic, and chemical data must be acquired and integrated to define the nature and extent of soil and ground water contamination and the potential for migration of contaminants within the natural ground water flow system.

To the extent practical, the remedy should be anticipated at the outset of an investigation so that design basis information necessary for development of the corrective action program is obtained in a timely and cost-effective manner.

**Development of Conceptual Site Model**

The hydrologic site investigation is the procedure by which we develop our understanding or our “working model” of contaminant plume migration within the ground water flow regime. In all cases, this model of subsurface environment is constructed of three principal components of information:

1. Geology: the physical framework within which subsurface fluids collect and flow;
2. Hydrology: the movement of fluids though this physical framework: and
3. Chemistry: the nature of the chemical constituents that are entrained in this flow system and the chemical and physical interactions between the contaminants and the subsurface formation and groundwater that may be occurring.

**Monitoring Ground water Quality**

To protect a ground water resource against pollution, a water quality monitoring program-defined as a scientifically designed surveillance system of continuing measurements, observation, and evaluation-is necessary. Monitoring methods may include not only sampling and analysis of ground water quality, but also determination of ground water levels and flow directions, measurements of moisture in the unsaturated zone, geophysical surveys, evaluations of wastes and other materials contributing to subsurface pollution, testing f pipelines and tanks, and aerial surveillance.

The procedure involves a series of action steps arranged in chronological order.

1. Select the area or basin to be monitored
2. Identify all sources and causes of pollution
3. Identify potential pollutants in the sources and causes
4. Define ground water usage in terms of location, type of use, and quantity.
5. Define the local hydrologic situation
6. Evaluate the existing ground water quality
7. Evaluate the infiltration rate of pollutants at ground surface
8. Evaluate the mobility of pollutants from ground surface to the water table
9. Evaluate the attenuation of pollutants within the saturated zone
10. Prioritize the sources and causes of pollution in terms of their importance or potential impact on ground water quality
11. Determine monitoring activities already in existence
12. Determine methods, locations, and frequencies for monitoring
13. Select and implement the monitoring program on a prioritized basis
14. Review and interpret monitoring data
15. Summarize and transmit monitoring information to appropriate public agencies and privet organization

The above procedure is flexible, allowing for changes over time in land use and water use and also for variations in financial resources to implement and improve such as monitoring program.