

Activity name: Ground Water Monitoring & Sampling

This activity is meant to provide a real-world application of the ATEEC Recommended Core Curriculum's math, science, technical, communications, or critical thinking knowledge and skill concepts, which have been identified by the ATEEC Fellows as necessary preparation for environmental technology occupations.

Appropriate for which course(s)? Sampling & Monitoring

Concept/skill learned (i.e. from K/S Tables): Measuring, mapping, interpreting data, writing reports and plans,

Approximate time to complete activity: Extended

Source of idea or activity (for published source, please include author, title, publisher, date): periodical (EPA protocols)

Materials/resources needed (equipment, print media, electronic media, videos, supplies, etc.):

- surveying equipment
- water level indicator or oil/water interface probe
- ground water sampling equipment
- access to a site with at least 3 monitor wells with uncontaminated water

Description of activity:

GROUND WATER MONITORING AND SAMPLING EXERCISE

NECESSARY SUPPORT: The instructor will need to have access to a property where at least three ground water monitor wells have been installed. These wells have to contain ground water that is not contaminated to avoid disposal costs. Many gasoline stations will fit this description.

THE SCENARIO: The students are employees of an environmental consulting firm or are the employees in the environmental department of a large firm. There is suspected ground water contamination on a piece of property. Ground water monitor wells have just been installed and the next step is to sample the ground water and assess the situation.

PART I

SITE MAP AND WELL SURVEY

Students make a site map showing major cultural features. They survey the monitor well elevations. (The instructor should provide an example site map of a similar site so students understand the level of detail required).

PART II

GROUND WATER MONITORING AND SAMPLING

Students prepare a sampling plan and obtain all equipment necessary to sample the ground water. Students then monitor and sample in accordance with the plan. They should record ground water elevations, presence of any visual contaminants, etc. They should store the bailed water in suitable containers for later disposal. They should fill appropriate sample containers and complete a chain-of-custody form.

Students complete a ground water elevation map and calculate flow direction and gradient.

PART III

SIMULATED ANALYSIS

Since the water is known to be clean, no actual laboratory analysis needs to be done. The instructor provides the students with a laboratory report of water analysis. (The analysis, of course, can be whatever the instructor wishes).

VARIATION: If your program includes laboratory water analysis, the instructor may provide prepared samples with contaminants to be analyzed. (This is just a typical chemistry laboratory unknown problem).

PART IV

DISPOSAL OF BAILED GROUND WATER

If your simulated analysis shows contamination, students should determine the appropriate steps to dispose of bailed ground water stored on site.

VARIATION: Since the wells were recently installed, we may assume that drill cuttings are still stored on site. A laboratory report showing soil contamination should be provided and the students determine how to dispose of the soil.

PART V

REPORT

The students use all of the above data to prepare a report for either the property owner or the appropriate regulatory agency. The report should include at least a site map, ground

water map, description of the sampling activity, ground water analysis results, etc. (The instructor should provide the students with an example report from another site). If the course level is appropriate, students can make a recommendation for the next step in remediation.

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