A FIELD-ORIENTED GENERAL CHEMISTRY COMMUNITY PROJECT: RAPID CREEK WATER QUALITY

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Rapid Creek water quality was determined during a group-oriented field research project in freshman chemistry. Student groups selected a stretch of Rapid Creek to map and develop a site appropriate sampling plan. Samples were collected and analyzed for a variety of water quality parameters, including anion and metal analysis. Course work was coordinated with aspects of the field and lab work to encourage the linkage of chemistry to a "real" situation.

Sampling sites were selected for a variety of reasons such as impacts from industrial waste, drainage ditch runoff, and wildlife contamination. Student teams recommended a large number of sites for sampling. The final selection limited the sites to fifteen. The sampling teams prepared the sample bottles by washing them and rinsing them with distilled water. At the sample sites the bottles were rinsed twice with ambient water before the samples were collected. The pH of each sample was tested. Each field sample was prepared for metal, anion, total suspended and total dissolved solid analysis.

The following conclusions have been made from the analysis so far completed. Urban impacts were clear, because chloride levels were clearly elevated in urban areas. Sulfate concentrations were elevated throughout all sampling areas. Impacts from industrial sources were obvious because almost all analyte levels were higher where industrial inflows entered the creek, near the middle of town. Nitrate concentrations were more ambiguous due to the date of sample collection (November 1997). Nitrate levels, in general, are lower in the winter and higher in the summer. The data collected, to date, has shown a steady degradation of the water quality along the entire length of Rapid Creek, Pactola Reservoir to the Waste Treatment Facility of Rapid City. The data also illustrated potential impacts from the Meadowbrook Golf Course.