



**CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY**

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Project Title
What's in Your River? Nitrates, Phosphates, Ammonia, Oh My!

Abstract

Objectives/Goals
My goal is to find out which area of the Santa Ana River contains the highest degree of pollution contaminants. I hope to get a better understanding of the quality of the Santa Ana River water. I chose this project because I started sampling the Santa Ana River in 2006 and I wanted to continue my project, refine the testing model, and continue taking water samples.

Methods/Materials
I interviewed lab analysts at the Riverside Water Quality Control Plant (RWQP) for water testing background information, and to get water sampling data for my project. Water sample sites were chosen consistent with WQCP testing sites: output dike at the WQCP, Hidden Valley Ponds, and Pedley Road. Coordinated water sampling dates with the water plants' lab analyzing runs. Samples were taken: 1/16, 1/22, 1/23, 1/24, 2007. Rinsed out the sample container with river water prior to collection to remove any contaminants. Recorded water temperature, air temperature, time location, and water turbidity. Took samples to the WQCP to be analyzed for fluorine, chloride, nitrite, nitrate, phosphate, and sulphate.

Results
Results are in milligrams per liter. The project design used three water sampling sites, however, the data from the out take dike at the WQCP was promised but not made available to me. Hidden Valley Ponds, Pedley Road averaged data: F: .65, .58; C:138, 99; NO3: 2.71, 35.25; PO4: 1.83,6.0; SO4: 141.8, 103.5; NH3: .25, .22.

Conclusions/Discussion
The Pedley Road samples had the highest degree of pollution with high amounts of nitrates averaging 34.27 mg/l. The EPA acceptable drinking water levels for nitrates are less than 4mg/l. Hidden Valley Pond nitrate levels averages 2.73mg/l. Sulfate levels at Pedley Road averaged 103.3 mg/l, and Hidden Valley 140 mg/l; acceptable drinking water levels are 80mg/l. The sulfate levels in eight samples were 43% higher than recommended by the EPA for drinking water. My hypothesis was correct: the Pedley Road samples would have higher concentrates of nitrates and phosphates due to the site being further downstream from the water plant and the nitrate scrubbing action provided by the Hidden Valley Ponds. The ammonia levels were below the national EPA standards. An aerial photo showed the Mira Loma Goose Neck Golf Course is directly upstream from the Pedley collection site and the grass fertilizer run-off may have affected the high nitrate and phosphate levels.

Summary Statement
I am trying to determine what area of the Santa An River has the highest degree of pollution contaminants.

Help Received
Lab water analyzing equipment at the Riverside Water Quality Control Plant used to analyze water samples. Anicia Yambot, lab analyst, at the Water Plant. Parents who drove me to sampling sites, mother helped build the board, and typed application forms.