



**CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY**

Name(s) Garen Gevorkian	Project Number J0617
Project Title Petros "rock", Oleum "oil" Petroleum: Oil from Rocks	
Abstract Objectives/Goals The purpose of this project is to see how the hydraulic conductivity of water and crude oil is different. I conducted two separate set of experiments, and compare the data collected. I used three different porous medium to calculate the hydraulic conductivity for water and crude oil. In the set of the crude oil experiments, used motor oil was used instead of crude oil. I chchose used motor oil, because the viscosity of the used motor oil is very close to crude oil. Methods/Materials I made two permeameters, one using plastic bottles (for water experiments) and one using syringes (for oil experiments). My first set of experiments was with water. I filled one bottle with 500mL water, and used the other one for porous medium (gravel, sand and gravel, and sand, all saturated with water) chamber. I recorded the time for falling head from 500mL to 200mL. The second set of experiments was with used motor oil simulating crude oil. I filled one of the syringes with 50mL oil. I used the other one for porous medium (the same with water experiments, gravel, sand and gravel, and sand, all saturated with used motor oil) chamber. I recorded the time for falling head from 50mL to 30mL. I used the falling-head equation $K_s = at/Ac * L/T * \ln(h_0/h_1)$ to find the hydraulic conductivity. Results I learned that the hydraulic conductivity does change with the viscosity, and the porous medium. My findings which agree with the literature are that the more porous the medium the higher the hydraulic conductivity, and also water has higher hydraulic conductivity compare to crude oil. Conclusions/Discussion I learned from my research that one other factor that will affect the hydraulic conductivity is the temperature. I would like to compare the data of hydraulic conductivity of liquids with different viscosities in different temperatures.	
Summary Statement Finding hydraulic conductivity by using falling head	
Help Received I received help from my parents and my uncle.	