**Memorandum**

To: Professor Sills

From: Lauren Frei, CENG 340 Lab

Date: September 24th

Re: Chlordane Removal using Granulated Activated Carbon

**Objective**

As per request, the data gathered from the assessment of treating water with granulated activated carbon (GAC) to reduce chlordane concentrations was modeled using two different models, the linear model and Freundlich model. The objective of this modeling was to determine which model best fit the gathered data points.

**Methods**

Using KaleidaGraph, both the linear model and Freundlich model were applied to the data series. KaleidaGraph was chosen over other graphing programs, such as Excel, because it has the ability to apply non-linear equations to data sets, which can provide a more accurate model. Both the linear model and Freundlich model was applied to the data set in order to determine which best matched the data. Visual inspection was used to determine which model best fit the gathered data from the GAC tests.

**Results and Discussion**

Using visual inspection, it was clear that the Freundlich model best represented the data. The model derived from the linear equation was a very poor fit for the data; the model was not close to most of the data points. The Freundlich model ran nicely through all of the data point, indicating a very strong representation. The graph of the Freundlich model plotted with the data points is shown in figure 1.



**Figure 1.** Mass of the adsorbate adsorbed per mass of the adsorbent at equilibrium (q) versus concentration of adsorbate in the aqueous phase at equilibrium (C). The line represents the fitted model, the Freundlich model, and circles represent the data points.

In addition, from KaleidaGraph, the equation for the Freundlich fitted model was determined. The determined equation is given in equation 1 below.

(Equation 1)

In equation 1, q, in units of corresponds to the mass of the adsorbate adsorbed per mass of the adsorbent at equilibrium and C corresponds to the concentration, in , of the aqueous phase at equilibrium.