CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	1999
DateRun:	08/15/1999
Experimenters:	Jason Marshall
ClientType:	Consultant
ProjectNumber:	Project #1
Substrates:	Liquid
PartType:	Coupon
Contaminants:	Alcohol
Cleaning Methods:	
Analytical Methods:	Colorimeter
Purpose:	To determine a method for evaluating soil loading of cleaning solutions.
Experimental Procedure:	Seven standards were made using DI water and Evanol in 100 ml beakers. Concentration of the Evanol was based on volume percent. The standards used were: 0, 1, 5, 10, 25, 50 and 100%. A LaMotte's Smart Colorimeter was used to evaluate the standards using several tests. The general test procedure was first to zero the instrument using the blank (DI water). A second DI water sample was read to establish the 0% standard (blank). The other standards were measured and values were recorded. The vial was rinsed in between each standard in order to ensure accurate readings. Using the recorded values, the data was plotted and analyzed using statistical methods available in Microsoft Excel. From the calculated relationships, the methods with the correlations closest to the ideal value of 1 will be selected for further evaluation. SUBSTRATE MATERIAL: Liquid CONTAMINANTS: DuPont Evanol (Vinyl Alcohol Polymers & Copolymers CAS#s: 9002-89-5, 25213-24-5, 54626-91-4; Methanol Bulk/Packaged CAS #: 67-56-1; Sodium Acetate CAS#: 127-09-3)
Results:	For each method tested, the seven standards were used to establish a relationship between the level of Evanol present in solution to the amount displayed using the colorimeter. Of the seven methods tested, three had correlations near 1. The Chlorine test had the highest r-value, 0.9987 followed by Nitrate-N, 0.9945 and Oxygen with an r-value of 0.9931. Tabe 1. Lists all of the correlation values for each method evaluated.

Table 1. Correlations (r) for Each Analysis Method

Log est of Data	Lin est of LN of Data	H2O2	Nitrate-N	Chlorine	Oxygen	User Test #1
0.971	0.971	0.9916	0.9945	0.9987	0.9931	0.987

*Ideal r = 1

The data calculated from the derived formula's were compared to the actual data in graphical form. Figures 1 -7 relates the actual and calculated values for each method.

Summary:

Conclusion: Three methods tested showed possible relationships that could be used to evaluate soil loading in the cleaning solutions. Next phase of Project 2 will be to make up cleaning solutions with known amounts of contaminant added to them and evaluating the three methods using the colorimeter and linking the relationship with cleaning efficiencies.