November 10, 1997

MEMORANDUM

TO: Nick Vizzone, EPA

THROUGH: Mary Wolfe, SAIC

CC: Anita Cummings and Elaine Eby, EPA

FROM: Howard Finkel, ICF

SUBJECT: Calculation of Universal Treatment Standard (UTS) for Antimony Using Data Submitted by Chemical Waste Management and Data Obtained From Rollins

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The purpose of this memorandum is to document the calculation of a revised UTS for antimony using (1) the data submitted by Chemical Waste Management (CWM) and (2) the combination of the CWM data with the initial data obtained from Rollins Environmental.

EVALUATION OF CWM'S DATA

I followed the methodology presented in "Final Best Demonstrated Available Technology (BDAT) Background Document For Quality Assurance/Quality Control Procedures and Methodology," dated October 23, 1991 to evaluate the data submitted by CWM in their August 12, 1997 comments. Attachment 1 presents a summary of all the data without any data manipulation. I note that a comparison of CWM's first summary table with the second summary table (both presented in Attachment 2 of the August 12, 1997 comment), revealed that CWM had omitted one sample from the first table. Specifically, sample #216242, which exhibited a TCLP concentration of 0.1533 mg/L for antimony, was not included by CWM on their first summary table; I included this sample in all subsequent analyses (see Attachment 1).

I then followed the accuracy correction procedure, as described in Attachment C-1 of the background document, to adjust the reported TCLP concentrations. In most cases, this correction was straight forward, as the observed TCLP concentration was divided by the reported percent recovery. However, in cases where (1) the reported percent recovery was greater than 100%, or (2) the reported percent recovery was NA, the percent recovery was set to 1, and the lowest percent recovery associated with that specific waste profile was used, respectively. At this point, I also removed the seven data points that CWM stated were suspect due to analytical interference from the population. Attachment 2 summarizes the corrected TCLP data, minus the samples reported by CWM as being "interfered."

In the next step, I used the Z-score test, as described in Attachment A-1 of the background document, to remove any values that fell outside of the -2.0 to +2.0 range. Based on the Z-score outlier test, I removed one value. Attachment 3 presents a summary of the Z-score analysis.

I then used the BDAT methodology to calculate the variability factor and treatment standard. Specifically, I followed Appendix D - Variability Factor to estimate the daily maximum variability factor using CWM's data. Following this procedure, I used equation [1], on page D-1 to calculate VF:

$$VF = \frac{C_{99}}{Mean}$$

Where:

$$C_{99} = EXP\ (y + 2.33 * Sy)$$

y	=	the mean of the logtransformed (natural log) data
Sy	=	the standard deviation of the logtransformed (natural log) data
Mean	=	the average of the individual performance values.

The treatment standard for antimony was then calculated by taking the product of the variability factor and mean constituent concentration. Attachment 4 presents both the variability factor and treatment standard calculated using CWM's data - minus the one outlier.[1]

EVALUATION OF CWM'S AND ROLLINS ENVIRONMENTAL'S DATA

I combined the corrected data submitted by CWM with the data obtained from Rollins Environmental that were previously evaluated. (This previously constructed data set already had the samples that either did not have influent TCLP concentrations or had effluent TCLP concentrations in excess of the influent TCLP concentrations removed from the population.) I then used the Z-score test, as described in Attachment A-1 of the background document, to remove any values that fell outside of the -2.0 to +2.0 range. Based on the Z-score outlier test, I again removed only one value. Attachment 5 presents a summary of the Z-score analysis for the combined data set.

I then used the BDAT methodology to calculate the variability factor and treatment standard for the combined data set. Attachment 6 presents both the variability factor and treatment standard calculated using both CWM's and Rollins Environmental's data - minus the one outlier.

For your convenience, I have summarized the revised UTS levels calculated for antimony below in Exhibit 1.

EXHIBIT 1

SUMMARY OF REVISED UTS LEVELS FOR ANTIMONY
(SOME VALUES HAVE BEEN ROUNDED)

	Proposed	CWM	CWM & Rollins Env.
Mean of Corrected Data	0.042	0.25	0.21
Variability Factor:	1.63	3.98	5.60

[1] I note that all of the remaining CWM data points exhibited treated TCLP concentrations for antimony that were lower than those concentrations exhibited by the untreated wastes samples provided in CWM's October 20, 1997 letter to Anita Cummings.

Treatment Standard:	0.07	0.99	1.15

If you have any questions regarding the attached analyses, please call me at (703) 934-3656.

attachments

ATTACHMENT 1

ATTACHMENT 2

ATTACHMENT 3

ATTACHMENT 4

ATTACHMENT 5

ATTACHMENT 6