December 7, 2011

Certified Mail 70111570000241601680
Return Receipt Requested

Florida Department of Environmental Protection
Hazardous Waste Regulation Section
Mr. Merlin Russell Jr.
2600 Blair Stone Rd., Room 310D
Tallahassee, FL 32399-2600

RE: Safety-Kleen Systems, Inc., Annual Recharacterization Program Information

Dear Mr. Russell:

The purpose of this correspondence is to provide the Department with information on Safety-Kleen's Annual Recharacterization Program (AR).

Every year, Safety-Kleen randomly samples more than two hundred containers of re-occurring industry specific waste that it collects and manages on a daily basis throughout the United States (i.e., "Core Wastes"). Specifically, these re-occurring wastes include:

- Safety-Kleen generated Core Waste – branch contaminated debris and solvent storage tank bottoms; and,
- Customer generated Core Waste - spent aqueous brake cleaning solution, immersion cleaner, parts washer solvent, automotive paint related waste, and dry cleaning waste (Perc and Naptha)

Samples are preserved and packaged in accordance with EPA SW-846 protocols and sent to an independent accredited 3rd party environmental laboratory for pH, flash point, and TCLP extracted metals/volatiles/semi-volatiles. Resulting data is coalesced for each Core Waste stream and evaluated in accordance with EPA SW-846 Chapter 9 statistical techniques for determining whether or not a spent material exhibits any RCRA hazardous characteristics.

The "statistically significant" waste codes derived from this analysis are the codes that Safety-Kleen expects to find from typical customers.

Safety-Kleen provides these codes and information on the AR process to generators so that they can use their site-specific information and this generic by statistically significant national Core

Waste information to determine the applicability of these codes to their wastes. Generators may use these codes as being representative of their waste stream, but only after applying "process knowledge"; i.e., confirmation that the generator's use is typical and that nothing has been added to the stream in their processes that would cause it to exhibit different waste codes than those identified by Safety-Kleen. Waste determinations and characterizations are clearly the legal responsibility of the waste generator under the state and federal environmental regulations (e.g., 40 CFR Parts 261 & 262).

Several enclosures pertaining to the AR Program are included as attachments to this letter and are meant to supplement our previous submittals to the Department regarding this relatively complex issue. These documents provide a more detailed explanation of the program than what can be included in the body of this letter; this additional information should answer most if not all of the remaining questions you may have about this program.

As discussed in our recent telephone conversation, the Safety-Kleen Tampa Facility Waste Analysis Plan (WAP) will be revised to include details of the AR Program and will then be resubmitted to the Department. Analytical data from the AR process can be found in the Safety-Kleen Tampa permit renewal application in Appendix B.

Thank you for the Department's time and attention to this important matter. If you have any questions, or require additional information, please do not hesitate to contact me. If needed, I have available to assist me our laboratory and statistical experts that would also be willing to meet with you to explain this AR Program and the attached document in greater detail (several of these internal SK experts have over 25 years of experience in implementing these SW-846 waste sampling, characterization, and statistical evaluation processes and can do more justice to these topics then can I). Again, please let me know if you need additional information regarding this issue. Thank you.

Sincerely,

Jeff Curtis
EHS Manager, Florida
Safety-Kleen Systems, Inc.
5610 Alpha Drive
Boynton Beach, FL 33426
jeff.curtis@safety-kleen.com

enclosures:
(1) Statistical Analysis of Annual Waste Characterization Data
(2) National Underlying Hazardous Constituents For 2010
(3) 2011 Final Annual Recharacterization Waste Code Assignments - National
(4) Annual Waste Recharacterization Customer Letter

Statistical Analysis of Annual Waste Characterization Data

Prepared by
Robert D. Gibbons Ph.D.

for

Safety Kleen
July 23, 1998

1 Introduction

Since 1990, Safety-Kleen has undertaken a major analytical study each year to document the contaminants in some of its most common waste streams to determine which TCLP waste codes should appear on the manifest for that waste. This Annual Waste Recharacterization Program is both expensive and extensive. Upon review, it appeared that regulatory agency instructions for how to interpret the data might not have been in line with current policy, as reflected in SW846. The general approach is based on development of an upper 90% confidence limit[1] for the true concentration of each constituent, which can in turn be directly compared to regulatory standards to determine if the waste code should or should not be added to a particular waste stream (e.g., Premium Gold Parts Washer Solvent 150). The regulatory basis for this type of comparison stems from U.S. EPA SW846 Chapter 9 (September 1986) guidance on determining if a waste stream is hazardous.[2] The primary complicating feature is the presence of large numbers of nondetects which raises serious question regarding the use of the parametric approach. In light of this concern, nonparametric methods are used throughout.[3] Specifically, following U.S. EPA SW846, we construct a nonparametric 90% upper confidence limit (UCL) for the 50th percentile of the distribution (i.e., median), which is equivalent to the 90% UCL for the mean in the case of a symmetric distribution such as the normal distribution.

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[1] "Consequently, the CI employed to evaluate solid wastes is, for all practical purposes, a 90% interval." U.S. EPA SW846 (1986) chapter 9 page 6.

[2] "The upper limit of the CI for μ is compared with the applicable regulatory threshold (RT) to determine if a solid waste contains the variable (chemical contaminant) of concern at a hazardous level. The contaminant of concern is not considered to be present in the waste at a hazardous level if the upper limit of the CI is less than the applicable RT. Otherwise the opposite conclusion is reached. "U.S. EPA SW846 (1986) chapter 9 page 3

[3] "If the data do not adequately follow the normal distribution even after logarithm transformation, a nonparametric confidence interval can be constructed. This interval is for the median concentration (which equals the mean if the distribution is symmetric)." U.S. EPA Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, April 1989, page 6-8

2 Method

Following Chapter 9 of SW846, the 90% UCL for the mean concentration obtained from a series of n representative samples is to be compared to the appropriate regulatory standard to determine if the waste stream is hazardous. If the UCL exceeds the standard, the waste stream is considered hazardous. The applicant must compute the UCL that is appropriate for the specific distributional form of the data. Given the large number of nondetects for many of the constituents, it is difficult if not impossible to clearly identify the underlying distributional form of the data. In this case, the U.S. EPA guidance indicates that a nonparametric alternative should be used.[4]

Nonparametric confidence limits are derived as follows. Given an unknown P x 100th percentile of interest (e.g. the 50th percentile or median),[5] where P is between 0 and 1, and n concentration measurements, the probability that any randomly selected concentration measurements being less than the P x 100th percentile is simply P and the probability of exceeding the P x 100th percentile is 1 - P. In light of this, the number of sample values falling below the P x 100th percentile out of a set of n measurements follows a Binomial distribution with parameters n and P.

The connection with the Binomial distribution can be used to determine an interval formed by a given pair of order statistics (i.e. ranked values) that will contain the percentile of interest, in this case the 50th percentile. Similarly, the Binomial distribution can also be used in constructing an upper limit (i.e. one-sided) for the percentile (e.g. a 90% upper confidence limit for the 50th percentile of the distribution). The computational formula for the cumulative binomial distribution $B(x;n,p)$, representing the probability of getting x or fewer successes in n trials with success probability p is given by

$$Bin(x;n,p) \equiv \sum_{i=0}^{x} \binom{n}{i} p^i (1-p)^{n-i}$$

To draw inference regarding the P = 50th percentile, we set p = .5 in the previous equation. For a one-sided UCL we compute

$$1-\alpha = 1 - Bin(U-1;n,.5)$$

beginning from the sample median. We then increase U by one until in this case 1 - α is equal to at least .90. The smallest value of U that provides 1 - $\alpha \geq .9$ is then the order statistic (i.e., ranked value) that is the nonparametric 90% UCL for the 50th percentile of the distribution.

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[4] "If the data do not adequately follow the normal distribution even after logarithm transformation, a nonparametric confidence interval can be constructed." U.S. EPA, 1989

[5] "This interval is for the median concentration (which equals the mean if the distribution is symmetric)." U.S. EPA (1989), page 6-8

3 Illustration

Consider the following most recent 50 data values for PCE (D039) obtained from Premium Gold Parts Washer Solvent-150.

Table 1
Premium Gold Parts Washer Solvent - 150
50 most recent samples in order of increasing concentration
in ppm

<50.000	<1.000	<0.100	<0.100	<0.100
<0.100	<0.100	<0.100	<0.100	<0.100
<0.100	0.110	0.200	0.200	0.220
0.230	0.260	0.510	0.870	0.880
1.000	1.300	1.500	1.800	2.000
2.700	2.700	3.300	5.400	7.000
7.100	12.000	12.300	17.200	19.700
20.000	20.000	21.200	23.600	32.300
51.100	52.500	136.000	211.000	286.000
508.000	635.000	771.000	940.000	2810.000

For n =50, p =.5 and 1 - α = .9, we find that U = 31 is the smallest order statistic that provides 90% confidence or more (1 - α = .941). As such, we select the 31st largest value in Table 1 which is 7.1 ppm as our UCL. Since 7.1 ppm is larger than the standard of 0.7 ppm, then the D039 waste code is required for this waste stream.

4 Conclusion

The data in the following package have been interpreted using the methodology described. The waste codes for each stream were determined as those parameters for which the 90% UCL for the median concentration was above the regulatory limit, based on review of the last two years of samples or the most recent 50 samples, whichever yielded the larger number of samples to consider.

NATIONAL UNDERLYING HAZARDOUS CONSTITUENTS FOR 2010
(Based on Analytical Data from 2007 thru 2009)

Aqueous Brake Cleaner		Branch Contaminated Debris		Immersion Cleaner (IC 699)		Parts Washer Solvent 105 (Recycled)		Parts Washer Solvents (Bulked) Combination of 105 and 150		Parts Washer Solvent Sludge/Dumpster Mud		Parts Washer Solvent Tank Bottoms (bulk)	
Cadmium	250	1,1-Dichloroethylene	122	1,4-Dichlorobenzene	118	Benzene	67	Benzene	67	Tetrachloroethylene	229	Tetrachloroethylene	229
Methyl Ethyl Ketone	184	1,2-Dichloroethane	121	2,4,5-Trichlorophenol	239	Cadmium	250	Cadmium	250	Barium	248	Benzene	250
Tetrachloroethylene	229	1,4-Dichlorobenzene	118	2,4,6-Trichlorophenol	240	Chromium	251	Chromium	251	Cadmium	250	Cadmium	255
		2,4,5-Trichlorophenol	239	Benzene	67	Lead	255	Lead	255	Chromium	251	Lead	255
		2,4,6-Trichlorophenol	240	Cadmium	250	Tetrachloroethylene	229	Silver	260	Lead	255	m-Cresol	101
		2,4-Dinitrotoluene	137	Chromium	251	Trichloroethylene	237	Tetrachloroethylene	229	Trichloroethylene	237	p-Cresol	102
		Acetone	51	Lead	255			Trichloroethylene	237			Trichloroethylene	237
		Arsenic	247	o-Cresol	100								
		Barium	248	Pentachlorophenol	211								
		Benzene	67	Silver	260								
		Cadmium	250	Tetrachloroethylene	229								
		Carbon tetrachloride	81	Trichloroethylene	237								
		Chlorobenzene	84										
		Chloroform	91										
		Chromium	251										
		Hexachlorobenzene	164										
		Hexachlorobutadiene	165										
		Hexachloroethane	169										
		Lead	255										
		m-Cresol	101										
		Mercury	257										
		Methyl ethyl ketone	184										
		Methyl isobutyl ketone	185										
		Nitrobenzene	193										
		o-Cresol	100										
		p-Cresol	102										
		Pentachlorophenol	211										
		Pyridine	220										
		Selenium	259										
		Silver	260										
		Tetrachloroethylene	229										
		Toluene	231										
		Trichloroethylene	237										
		Vinyl chloride	244										
		Xylenes	245										

NATIONAL UNDERLYING HAZARDOUS CONSTITUENTS FOR 2010
(Based on Analytical Data from 2007 thru 2009)

Parts Washer Solvent	150	Paint Gun Cleaner Related Wastes		Dry Cleaner (Perc) Bottoms		Dry Cleaner (Perc) Filters		Dry Cleaner (Perc) Separator Water		Dry Cleaner Naphtha Bottoms		Dry Cleaner Naphtha Fi
Tetrachloroethylene	229	2,4,5-Trichlorophenol	239	1,1-Dichloroethylene	122	1,1-Dichloroethylene	122	1,1-Dichloroethylene	122	Chromium	251	Chromium
Cadmium	250	Acetone	51	2,4,5-Trichlorophenol	239	2,4,5-Trichlorophenol	239	2,4,5-Trichlorophenol	239	2,4,5-Trichlorophenol	239	2,4,5-Trichlorophenol
Chromium	251	Barium	248	Cadmium	250	Cadmium	250	Cadmium	250	Lead	255	Lead
Lead	255	Benzene	67	Chloroform	91	Chloroform	91	Chloroform	91	m-Cresol	101	m-Cresol
Mercury	257	Cadmium	250	Chromium	251	Chromium	251	Chromium	251	Nitrobenzene	193	Nitrobenzene
Trichloroethylene	237	Chloroform	91	Lead	255	Lead	255	Lead	255	p-Cresol	102	p-Cresol
		Chromium	251	Mercury	257	Mercury	257	Mercury	257	Pentachlorophenol	211	Pentachlorophenol
		Lead	255	Pentachlorophenol	211	Pentachlorophenol	211	Pentachlorophenol	211	Pyridine	220	Pyridine
		m-Cresol	101	Silver	260	Silver	260	Silver	260	Tetrachloroethylene	229	Tetrachloroethylene
		Mercury	257	Tetrachloroethylene	229	Tetrachloroethylene	229	Tetrachloroethylene	229	Trichlorethylene	237	Trichlorethylene
		Methyl ethyl ketone	184	Trichloroethylene	237	Trichloroethylene	237	Trichloroethylene	237	Chlorobenzene	84	Chlorobenzene
		Methyl isobutyl ketone	185	m-Cresol	101	m-Cresol	101	m-Cresol	101			
		o-Cresol	100	p-Cresol	102	p-Cresol	102	p-Cresol	102			
		p-Cresol	102									
		Pentachlorophenol	211									
		Tetrachloroethylene	229									
		Toluene	231									
		Trichloroethylene	237									
		Xylenes	245									

NATIONAL UNDERLYING HAZARDOUS CONSTITUENTS FOR 2010
(Based on Analytical Data from 2007 thru 2009)

ters	Dry Cleaner Naphtha Separator Water		Aqueous Parts Washer Tank Bottoms		Aqueous Parts Wash Dumpster Sludge
251	Chromium	251	Tetrachloroethylene	229	Cadmium
239	2,4,5-Trichlorophenol	239	Cadmium	250	Chromium
255	Lead	255	Lead	255	Lead
101	m-Cresol	101	Trichlorethylene	237	Tetrachloroethylene
193	Nitrobenzene	193	Chromium	251	Barium
102	p-Cresol	102			Silver
211	Pentachlorophenol	211			
220	Pyridine	220			
229	Tetrachloroethylene	229			
237	Trichlorethylene	237			
84	Chlorobenzene	84			

2011 Final Annual Recharacterization Waste Code Assignments - National

WASTE STREAMS			WASTE CODE CHANGES - NATIONAL		
2010 NATIONAL Profile/SKDOT	General Description	2010 National Waste Codes	2011 National Waste Codes	Changes from 2010 to 2011	2011 NATIONAL Profile/SKDOT
150629 / 839	Aqueous Brake Cleaner	D039	D039	No Change	150100 / 839
150693 /16001 (Solid & Liq Mix), 150701 / 16012 (Solid - no D001), 150695 / 16003 (Liq)	Branch Contaminated Debris	F002, F003, F005, D001, D004, D005, D006, D007, D008, D009, D010, D011, D018, D019, D021, D022, D023, D024, D025, D026, D027, D028, D029, D030, D032, D033, D034, D035, D036, D037, D038, D039, D040, D041, D042, D043	F002, F003, F005, D001, D004, D005, D006, D007, D008, D009, D010, D011, D018, D019, D021, D022, D023, D024, D025, D026, D027, D028, D029, D030, D032, D033, D034, D035, D036, D037, D038, D039, D040, D041, D042, D043	No Change	150693 /16001 (Solid & Liq Mix), 150701 / 16012 (Solid - no D001), 150695 / 16003 (Liq)
150629 / 14952	Immersion Cleaner (IC 699)	D006, D008, D018, D027, D037, D039, D040, D042	D006, D008, D018, D027, D039, D040	**Remove D037, D042**	150629 / **950**
150045 / 7008607, 150085 / 7008611(RQ)	Parts Washer Solvent 105 Virgin	D001, D039	D001, D039	Changed effective 6/19/2011 due to virgin being the only 105 solvent	150045 / 7008607, 150085 / 7008611(RQ)
150379 / 11657 (Bulk)	Parts Washer Solvents (Bulked) / Combination of 105 and 150 (Aqueous, where applicable)	D001, D018, D039, D040	D001, D018, D039, D040	No Change	150379 / 11657 (Bulk)
150378 / 11656	Parts Washer Solvent Sludge/Dumpster Mud	D001, D039	D001, D039	No Change	150378 / 11656
150633 / 15001	Parts Washer Solvent Tank Bottoms (bulk)**	D039, D040	**D018**, D039, D040	**Add D018**	150633 / **6994701**
150055 / 717	Parts Washer Solvent 150	D039	D039	No Change	150055 / 717
150055 / 717	PRF and PDF Mil Spec. Solvent	D039	D039	No Change	150055 / 717
150380 / 11658, 150425 / 12606(RQ)	Paint Gun Cleaner (SK)	F003, F005, D001, D018, D035, D039, D040	F003, F005, D001, D018, D035, D039, D040	No Change	150380 / 11658, 150425 / 12606(RQ)
150426 / 12607, 150427 / 12608(RQ)	Clear Choice Paint Gun Cleaner	F003, D001, D018, D035, D039, D040	F003, D001, D018, D035, D039, D040	No Change	150426 / 12607, 150427 / 12608(RQ)
150375 / 11653(ANY), 150376 / 11654(30), 150377 / 11655(55)	Paint Waste Other ***	F003, F005, D001, D018, D035, D039, D040	F003, F005, D001, D018, D035, D039, D040	No Change	150375 / 11653(ANY), 150376 / 11654(30), 150377 / 11655(55)
150589 / 14627	Dry Cleaner (Perc) Bottoms	F002, D007, D029, D039, D040	F002, D007, D029, D039, D040	No Change	150589 / 14627
150621 / 14906	Dry Cleaner (Perc) Filters	F002, D007, D029, D039, D040	F002, D007, D029, D039, D040	No Change	150621 / 14906
150591 / 14631	Dry Cleaner (Perc) Separator Water	F002, D029, D039, D040	F002, D029, D039, D040	No Change	150591 / 14631
150422 / 12565	Dry Cleaning Naphtha Bottoms	D001, D007, D039, D040	D001, D007, D039, D040	No Change	150422 / 12565
150424 / 12569	Dry Cleaning Naphtha Filters	D001, D007, D039, D040	D001, D007, D039, D040	No Change	150424 / 12569
150423 / 12566	Dry Cleaning Naphtha Separator Water	D001, D039, D040	D001, D039, D040	No Change	150423 / 12566
150696 / 16004	Aqueous Parts Washer Tank Bottoms	D039, D040	D039, D040	No Change	150696 / 16004
150626 / 14949	Aqueous Parts Washer Dumpster Sludge	NONE	NONE	No Change	150626 / 14949

** Parts washer solvent tank bottoms are SK-generated wastes from the cleanout of solvent storage tanks.
Safety-Kleen does not accept this waste stream from non-SK generators.

*** SKDOT 11653 is acceptable to use for any size container of paint waste.
For those states that require 30-gal paint waste to be listed separately, use SK DOT 11654;
for states that require 55-gal paint waste to be listed separately, use SK DOT 11655.

Safety-Kleen Systems, Inc.

Year 2011 Annual Waste Recharacterization

Dear Customer,

Attached are the 2011 waste descriptions based on the Annual Waste Recharacterization for the waste streams Safety-Kleen manages as Hazardous Core Waste Streams. This data reflects the waste codes that we normally find in the management of these industry specific waste streams. The purpose of this memo is to clarify the reasoning behind our use of waste codes and the Annual Recharacterization process.

Under the hazardous waste management regulations, it is the generator's responsibility to describe hazardous waste prior to sending that waste for treatment or disposal. Safety-Kleen does not accept this responsibility on behalf of you, the generator. Once a waste stream is terminated at one of our facilities, however, Safety-Kleen does assume the generator's responsibility of that waste. In addition, because Safety-Kleen handles the same waste stream from many thousands of customers, we are able to provide those customers with information about the typical characteristics of their waste, which they can use as "Generator knowledge" in assigning waste codes.

This year, the quantitative analyses of the samples and statistical analyses of the resultant data in the Annual Recharacterization have determined that some waste codes be added or removed from certain waste streams. These waste code changes are included in the Annual Recharacterization based on the frequency at which they were detected at regulated levels in the analytical data.

If a generator chooses to use Safety-Kleen's Annual Recharacterization analysis as knowledge of its process, and uses a service that is consistent with the Recharacterization, then we accept the waste for termination as is. Safety-Kleen Compliance and Technical Center personnel will, however, have to approve customer specific waste codes, if a generator chooses to use its own knowledge of its process to identify which waste codes are attached to the waste. Laboratory analytical data will be required to remove codes determined by the Annual Recharacterization process. It is also highly recommended that the generator be able to back up any claims when inspected by a regulatory agency.

To offer the generator analytical data to back up their claim on which waste codes they feel should be attached to their solvent, Safety-Kleen has introduced cost effective services to screen many waste streams for typical waste codes found in the stream. This service is for customers that do not wish to use Safety-Kleen's Annual Recharacterization as a part of their generator knowledge. Waste codes can be removed from the paperwork if a certain code (or codes) is not found to be present and the generator has adequate analyses to back up the claim.

Attached to this letter you will find the waste code descriptions that will be used in 2011 based on Safety-Kleen's Annual Recharacterization. Should you have any questions, please call the Branch Manager at the phone number listed on your service document. Thank you for trusting Safety-Kleen as your partner in waste management.

Sincerely,

(name)
Branch Manager