



Determining the Hazardous Waste Generation Rate for On-Site Solvent Recycling Technical Guidance Document HW-2011-G3

This technical guidance document (TGD) explains how to calculate the amount of spent solvent that should be counted towards the amount of hazardous waste generated in a month. This document also discusses container management for spent solvent and includes a sample calculation log that can be used to assist in required recordkeeping.

Background

Regulatory requirements for hazardous waste generators depend on whether the generator is classified as a Large quantity generator, Small quantity generator, Kansas small quantity generator, or Conditionally exempt small quantity generator. Generator classification is determined in part by the amount of hazardous waste that is generated each month, so it is important to calculate this generation rate correctly.

If a generator recycles solvent on-site, the spent solvent is not counted towards the generation rate each time it is used. The Kansas Department of Health and Environment (KDHE) encourages generators to recycle spent solvent but recognizes that recycling can make it harder to determine the amount of hazardous waste that has been generated and which container management requirements apply.

The requirements for counting hazardous waste that is reclaimed (recycled) on-site are found in the Federal regulation 40 CFR 261.5, which has been adopted by Kansas regulation KAR 28-31-261.

Spent Solvent that is NOT Accumulated (Stored) Prior to Recycling

If spent solvent is transferred directly into a solvent distillation unit without prior storage or accumulation, it is not subject to container management requirements and it does not have

to be counted in determining the generator's classification.

Spent Solvent that IS Accumulated (Stored) Prior to Recycling

If spent solvent is accumulated in containers or tanks prior to recycling, it becomes subject to many requirements, including container management and counting.

Containers of spent solvent waiting to be recycled are subject to all hazardous waste management requirements. Most will be considered storage containers because they do not meet the definition of satellite containers. Storage containers must be:

- Labeled with the words "Hazardous Waste";
- Closed unless adding or removing waste;
- Marked with the accumulation start date; and
- Inspected (weekly or monthly depending on generator classification).

Please refer to TGD HW-2005-G1: "Container Management for Hazardous Waste Generators" for additional information on container management.

After recycling, the recycled solvent is not a waste, and therefore is not subject to container management requirements. Best management practice is to label the drums of recycled solvent with their contents (i.e. solvent, recycled solvent, good solvent, etc.).

Still Bottoms

The solid waste coming out of the solvent distillation unit goes by many names, including still bottoms, pancakes, cakes, distillation solids, and pugs. In this document, they all will be referred to as “still bottoms.”

Still bottoms are subject to a hazardous waste determination like any other waste stream. If the spent solvent generating the still bottoms is a listed hazardous waste, the still bottoms would also be a listed hazardous waste. If the spent solvent is not listed, but exhibits the characteristic of ignitability, the still bottoms would only be hazardous if they exhibit one or more characteristics of a hazardous waste (e.g., ignitability, and/or toxicity). For more information on waste determinations please refer to TGD HW-2011-G1, Hazardous Waste Determinations and Documentation.

If the still bottoms are a hazardous waste, the container of still bottoms is subject to all hazardous waste container management requirements.

Hazardous Waste Counting

40 CFR 261.5(d) states: “In determining the quantity of hazardous waste generated, a generator need not include: ...

- (2) Hazardous waste produced by on-site treatment (including reclamation) of his hazardous waste, so long as the hazardous waste that is treated was counted once;
- (3) Spent materials that are generated, reclaimed, and subsequently reused on-site, so long as such spent materials have been counted once.”

EPA’s RCRA Online document “SQG Quantity Determinations” (RO 12699) clarifies that “counted once” refers to counting within a calendar month.

This means that spent solvent reclaimed in an on-site distillation unit need only be counted once in a calendar month, and that still bottoms generated from that recycling do not count (because the solvent has already been counted). The second time this solvent is recycled in the

same calendar month, the newly recycled solvent does not count toward the generator status, but the weight of the still bottoms would count (because the solvent has not been accounted for).

The easiest way to understand this is to look at some examples. Please refer to the attached Example Log for the following scenarios.

EXAMPLE 1

Company ABC has a 10-gallon distillation unit and their solvent is an F005-listed solvent that weighs 7 lbs per gallon.

January 1: They recycle 10 gallons (70 lbs) of spent solvent and recover 8 gallons. They generate a 0.5 lb of still bottoms, which isn’t counted because the solvent it came from was already counted. That means on January 1 they generate **70 lbs** of hazardous waste (F005 spent solvent). They put the 8 gallons of recovered solvent back into their process, which does not require them to add any new solvent.

January 7: They recycle the 8 gallons of previously recovered solvent. This time they generate 7 gallons of recovered solvent and 1 lb of still bottoms. The recovered solvent does not need to be counted because it was already counted in January. Therefore, on January 7 they generate **1 lb** of hazardous waste. They put the 7 gallons of recovered solvent back into their process, which does not require them to add any new solvent.

January 15: They recycle the 7 gallons of previously recovered solvent, and generate 6 gallons of recovered solvent (not counted) and 0.75 lbs of still bottoms (counted). On January 15, **0.75 lbs** of hazardous waste was generated.

From January 1 to 15, a total of **71.75 lbs** of hazardous waste was generated.

EXAMPLE 2

Company XYZ has a 10-gallon distillation unit and their solvent is an F005-listed solvent that weighs 8 lbs per gallon.

May 1: They recycle 10 gallons (80 lb) of spent solvent (counted) and recover 8 gallons. They generate 1 lb of still bottoms (not counted). That means on May 1 they generated **80 lbs** of hazardous waste (F005 spent solvent). Their process requires that they always use 10 gallons of solvent, and therefore they must add 2 gallons of new solvent to the 8 gallons of recycled solvent.

May 15: They recycle their solvent (all 10 gallons) and generate 9 gallons of recycled solvent and 1 lb of still bottoms. Because they have already counted 8 gallons of this solvent on the first of the month, they only need to count the 2 gallons (16 lbs) of new solvent that was added.

The portion of still bottoms generated from the new solvent does not need to be counted. The portion of still bottoms from previously recycled solvent is counted, and is calculated multiplying the total amount of still bottoms by the proportion of previously recycled solvent in the total amount being recycled (in this case 80%). The formula is shown in Column G on the example log. In this example, 0.8 lb of the still bottoms needs to be counted, for a total of **16.8 lbs** of hazardous waste on May 15.

Since their process requires that they always use 10 gallons of solvent, they must add 1 gallon of new solvent to the 9 gallons of recycled solvent.

May 28: The company again recycles the 10 gallons of solvent. Nine gallons have been previously recycled that month, so only one gallon (or 8 lbs) counts towards the generation amount. One pound of still bottoms is generated. Since 90% of the solvent had already been recycled, only 0.9 lb of the still bottoms counts towards the amount of

hazardous waste generated. Therefore **8.9 lbs** of hazardous waste was generated on the 28th.

In May, **105.7 lbs** of hazardous waste was generated by this distillation unit. The company does not distill solvent again until June, at which time all of the solvent will be counted again for that month's first distillation event.

Recordkeeping

Facilities should maintain a solvent distillation log or record that documents the following information for each distillation run:

- The date of each spent solvent batch;
- The amount of spent solvent being distilled in the batch;
- How much of the batch being distilled is:
 - newly spent,
 - previously distilled the current month, or
 - previously distilled from a prior month; and
- The weight of still bottoms produced.

The attached log may be used, but this exact document is not required.

Summary

KDHE recognizes that this method of counting can be very difficult. Remember to consider every calendar month a new counting event. Any previously distilled spent solvent left over from a previous month is considered never distilled (or new solvent).

A generator may choose to count the waste solvent each time it is added to the distillation unit and not count the still bottoms, rather than the more complicated procedures described above. Please be aware that this method of counting could result in being classified as a larger generator.

The recommendations and examples are for guidance only and are not intended to replace other regulatory requirements.

For additional information regarding the proper management of solid or hazardous waste in Kansas, you may contact the Bureau of Waste Management at (785) 296-1600, or the address at the beginning of this document, or visit the Bureau's website at <http://www.kdheks.gov/waste/>.

Example Log to Calculate Hazardous Waste Generation from On-Site Solvent Recycling

Column Names									
A	B	C	D	E	F	G	H	I	J
Date	Gallons of solvent in batch previously distilled this month	Gallons of newly spent solvent in batch	Weight of one gallon of solvent (lb)	Pounds of solvent that count toward HW totals	Pounds of still bottoms generated this batch	Pounds of still bottoms from solvent that has been previously recycled this month	Pounds of HW generated from solvent recycling this batch	Gallons of solvent recovered	Gallons of new solvent added to process
			Weigh 1 gallon of solvent or look at MSDS	C*D	Weigh the still bottoms	$(B/(B+C))*F$	E+G		
Example 1 - Company ABC									
Jan 1	0	10	7	70	0.5	0	70	8	0
Jan 7	8	0	7	0	1	1	1	7	0
Jan 15	7	0	7	0	0.75	0.75	0.75	6	0
January Total, Example 1							71.75		

Example 2 - Company XYZ									
May 1	0	10	8	80	1	0	80	8	2
May 15	8	2	8	16	1	0.8	16.8	9	1
May 28	9	1	8	8	1	0.9	8.9	8	2
May Total, Example 2							105.7		

HW - Hazardous Waste

Newly Spent Solvent - Solvent that has been used and recycled, but not yet counted this month.

Process - The term process is used on this spreadsheet to refer to the industrial use for the solvent (i.e. parts washer, cleaning)

Batch - Total amount of solvent being recycled on that date.

NOTE: Remember that counting starts over at the beginning of every calendar month.

NOTE: The numbers in this table are for illustration only. The weight of one gallon of solvent will vary depending on the type of solvent and how the solvent is used. Therefore, you must initially calculate the weight (in pounds) of one gallon of solvent (Column D).

