



**STANDARD OPERATING PROCEDURE FOR:
DRUMMED MATERIAL SAMPLING**

TVA-KIF-SOP-24, Revision 1

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for
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Revision Log SOP for Drummed Material Sampling (TVA-KIF-SOP-24)		
Revision and Date	Section Reference	Revision Description
1, May 2010	Throughout	Added boom and pad sampling to the used-oil drum sampling. Field Sampling Plan reference was deleted.
	Title	Changed title from “Used Oil Drum Sampling” to “Drummed Material Sampling” to include things other than used oil.
	Section 3.0	Streamlined text describing role of QA Officer in procedural variations.
	New Section 3.3	Added new section on boom and pad sampling.
	Table 1	Updated.

1.0 PURPOSE

This standard operating procedure (SOP) provides the general technical requirements and operational guidelines for collecting used oil from drums and other waste materials at the Kingston Fossil Plant (KIF) for the purpose of generating samples that are representative of the media the samples are intended to characterize. The requirements of this SOP are applicable to sampling drums containing used oil generated from on-site heavy equipment maintenance.

2.0 GENERAL CONSIDERATIONS

Potential hazards associated with the planned tasks shall be thoroughly evaluated prior to conducting field activities. The *Site-Wide Safety and Health Plan (SWSHP)* provides a description of potential hazards and associated safety and control measures.

This drum material sampling SOP was developed using the sampling requirements detailed in the *Field Documentation SOP (TVA-KIF-SOP-06)*; *Sample Labeling, Packing, and Shipping SOP (TVA-KIF-SOP-07)*; *Decontamination SOP (TVA-KIF-SOP-08)*; *Field QC Sampling SOP (TVA-KIF-SOP-11)*; and *Management of Investigation Derived Waste SOP (TVA-KIF-SOP-12)*. This SOP was also developed under the guidelines provided in U.S. Environmental Protection Agency (EPA) *Drum Sampling* (Environmental Response Team SOP No.2009).

3.0 DRUM SAMPLING PROCEDURES

This section documents general operating procedures and methods associated with used oil-drum and boom and pad sampling activities. Any variation in these procedures is approved by the Project Manager and Quality Assurance (QA) Officer and is fully documented. Field work cannot progress until deviations are approved or resolved.

3.1 Pre-Job Preparation

A used oil drum sample device (and associated methodology) is selected based on the viscosity and nature of the used oil. A drum thief sample device of adequate diameter that can maintain proper air pressure (given the surface tension of the used oil) to keep the used oil inside the drum thief shall be selected. If a drum thief cannot be utilized, a Coliwsa sampler (or other full-column sampling device) is to be used. The selected drum sampler shall be disposable or made of an easily decontaminated material (such as glass) and able to reach the bottom of the drum (at least 36 inches).

The Field Team Leader ensures that the following activities have been completed prior to mobilizing to the site.

- a. Obtain equipment necessary for completing the project-specific sampling activities (see Table 1 for an example checklist of used oil drum sampling equipment and materials).
- b. Verify that appropriate laboratory-provided bottleware is available for both the required analyses and for quality control (QC) samples and that there has been thorough coordination with the analytical laboratory.
- c. Review project work control documents including the *Quality Assurance Project Plan* (TVA-KIF-QAPP) in an effort to determine the project-specific sampling requirements, procedures, and goals.
- d. Verify used oil drums are properly placarded and labeled with the fill date and drum content information. The supervisor is contacted to ascertain fill dates and drum contents if the drums are not properly placarded and labeled.
- e. Catalogue drums by assigning a classification number from 1 to X (where X is the total number of drums that are being sampled) and sequentially number based on date filled order. Make sure that appropriate sample label nomenclature is used.

3.2 Used Oil Drum Sampling

Care must be taken when collecting used oil drum samples to ensure that used oil is not spilled during the collection process. When the used oil sample device is retrieved from the drum, used oil adheres to the outer surface of the sample device. As the sample device is drawn from the drum, all efforts shall be made to ensure used oil is not released to the ground surface.

KIF used oil drum sampling is generally conducted for waste characterization and disposal purposes. Used oil drums are typically filled from larger tanker trucks (once they are filled) that collect and temporarily store used oil during periodic heavy equipment maintenance.

- a. When collecting composite samples, collect samples from drums that are filled on the same date from the same tanker truck. Collect one composite sample for every five sequentially numbered drums (or as agreed upon by the disposal facility and TVA). If there are not enough drums required for a composite sample, then collect the composite sample from the remaining drums. Place aliquots for composite samples together in a new or decontaminated, plastic or glass homogenizing container of sufficient volume (at least 2.5 gallons).
- b. When collecting grab samples, collect samples from single drums containing used oil unique to that drum filled on a unique date.

- c. Loosen the bung slowly to allow any excess pressure to escape.
- d. Completely remove bung.
- e. Cover the ground surface around the drum and the homogenization or sample container with polysheeting and absorbent spill pads.
- f. When collecting composite samples, place the homogenization container near the collection area to avoid spills.
- g. Record approximate height of used oil in the drum. (For example, insert the drum sampling device to the bottom of the drum, then remove the sampling device and record the height of the oil on the outside of the sampling device.)
- h. Follow manufacturer's specifications for using the selected drum sampling device. Care should be taken to avoid disturbing any solids that may have settled on the bottom of the drum and to avoid spilling used oil to the ground surface. When collecting composite samples, collect an equal volume from each drum and deposit the contents in the homogenization container.
- i. When collecting samples using a homogenization container, lightly swirl the container to mix any stratification that may have taken place during filling activities.
- j. Pour the contents of the homogenization container into appropriate laboratory bottleware.
- k. Decontaminate the drum sample device in accordance with *Decontamination of Equipment SOP* (TVA-KIF-SOP-08) or obtain a new drum sample device between separate composite samples and grab samples.

3.3 Boom and Pad Sampling

The minimum required weight (specified by the analytical testing laboratory) for boom and pad samples is 500 grams. Given the low density of the materials being sampled, it is necessary to use a field scale to measure the weight being collected. The sampler may have to fill multiple sample containers until the total weight requirement is met.

- a. Set-up a sampling area by laying plastic sheeting on the ground or on an elevated surface.
- b. Combine the sampled materials into one composite sample for the drum.
- c. Tare the empty composite containers on the field scale.

Note: Follow manufacturer's specifications for using the selected field scale.

- d. Make a qualitative assessment regarding the proportions of different types of materials present in the drum (such as 40% booms, 10% rags, and 20% pads) using the sampler's best judgment.

- e. Record the relative proportions of each type of material identified from the previous step.
- f. Obtain representative proportions of each type of material (sub-sample) identified in Step *b* and set those materials on the plastic sheeting in the sampling area. Make sure that sub-samples of each type of material are reasonably representative of the abundance of “clean” and “dirty” examples of that material as is present in the drum’s contents. This assessment is based on the sampler’s best judgment.
- g. From each sub-sample of material obtained (such as booms, rags, pads, etc.), cut portions of that material which are equivalent parts virgin/impacted as the material being sampled using the sampler’s best judgment. For example, if a pad type material is obtained which is approximately 30% impacted and 70% virgin, the portion(s) cut for the sample should be approximately 30% impacted and 70% virgin.
- h. Combine the sampled materials into one composite sample for the drum.
- i. Record the final weight of the sampled materials.

3.4 Sample Handling, Packing, and Shipping

Samples will be containerized, labeled, packaged, and shipped in accordance with the *Sample Labeling, Packing, and Shipping* SOP (TVA-KIF-SOP-07).

3.5 Field Logbook Documentation

Field logbooks are maintained by the Field Team Leader or designee and used to record daily activities. In addition to the minimum requirements discussed in the *Field Documentation* SOP (TVA-KIF-SOP-06), the field logbooks document the used oil homogenization activities specific to this SOP and as defined in the applicable project work control documents.

The Field Team Leader and/or designee reviews the field logbook entries for completeness and accuracy and indicates this review by initialing each page of the logbook. The Field Team Leader is responsible for completion of the required data collection forms.

3.6 Decontamination and Waste Management

Sampling equipment decontamination is performed in a manner consistent with the *Decontamination of Equipment* SOP (TVA-KIF-SOP-08). Investigation-derived wastes produced during sampling or decontamination are managed in accordance with *Management of Investigation-Derived Waste* SOP (TVA-KIF-SOP-12).

4.0 REFERENCES

- Tennessee Valley Authority (TVA). *Decontamination of Equipment* SOP (TVA-KIF-SOP-08), 2010.
- TVA. *Field Documentation* SOP (TVA-KIF-SOP-06), 2009.
- TVA. *Field Quality Control Sampling* SOP (TVA-KIF-SOP-11), 2009.
- TVA. *Management of Investigation-Derived Waste* SOP (TVA-KIF-SOP-12), 2010.
- TVA. *Quality Assurance Project Plan for the Tennessee Valley Authority Kingston Ash Recovery Project* (TVA-KIF-QAPP), December 18, 2009.
- TVA. *Sampling Labeling, Packing, and Shipping* SOP (TVA-KIF-SOP-07), 2009.
- TVA. *Site-Wide Safety and Health Plan for the TVA Kingston Fossil Plant Ash Release Response* (SWSHP), 2010.
- U.S. Environmental Protection Agency Environmental Response Team. *Drum Sampling Standard Operating Procedure*. SOP No. 2009, Revision # 0.0, Edison, NJ, November 16, 1994.

Table 1: Drummed Materials Sampling Equipment and Material Checklist	
Item Description	Check
Health & Safety	
Nitrile gloves	
Hard hat	
Steel-toed boots	
Hearing protection	
Field first-aid kit	
Eyewash	
Safety glasses	
Respirator and cartridges (if necessary)	
Saranex™/Tyvek® suits and booties (if necessary)	
Sampling Equipment	
Used Oil drum sampling device (drum thief or Coliwasa sampler)	
Scissors	
Portable field scale (capable of measuring up to 1 kilogram and able to be tared)	
Portable table	
Bung wrench and drum wrench	
Plastic sheeting	
Absorbent Pads	
Homogenization container	
Packing tape	
Duct tape	
Field logbook	
Chain-of-Custody	
Digital camera	
Trash bags	
Paper towels	

End of Procedure