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Standard Practice for Sampling Waste Streams on Conveyors[1]

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1. Scope

1.1 This practice describes standard procedures for sampling waste on open and closed conveying systems and is applicable to any waste material that can be conveyed to a waste pile or container. The conveyor system can be a vertical (vertical lifts), sloped or horizontal type.

1.2 This practice is intended for particles and slurries, which can be sampled using scoop, dipper, or shovel type samplers.

1.3 The practice is not intended for large size sample constituents, such as boulders, large rocks, and debris.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D4547 Guide for Sampling Waste and Soils for Volatile Organic Compounds

D4687 Guide for General Planning of Waste Sampling

D4916 Practice for Mechanical Auger Sampling (Withdrawn 2008)[3]

D5088 Practice for Decontamination of Field Equipment Used at Waste Sites

D5283 Practice for Generation of Environmental Data Related to Waste Management Activities: Quality Assurance and Quality Control Planning and Implementation

D5633 Practice for Sampling with a Scoop

D5658 Practice for Sampling Unconsolidated Waste From Trucks

D5680 Practice for Sampling Unconsolidated Solids in Drums or Similar Containers

D5681 Terminology for Waste and Waste Management

D5792 Practice for Generation of Environmental Data Related to Waste Management Activities: Development of Data Quality Objectives

D5956 Guide for Sampling Strategies for Heterogeneous Wastes

D6009 Guide for Sampling Waste Piles

D6051 Guide for Composite Sampling and Field Subsampling for Environmental Waste Management Activities

D6232 Guide for Selection of Sampling Equipment for Waste and Contaminated Media Data Collection Activities

D6250 Practice for Derivation of Decision Point and Confidence Limit for Statistical Testing of Mean Concentration in Waste Management Decisions

D6311 Guide for Generation of Environmental Data Related to Waste Management Activities: Selection and Optimization of Sampling Design

3. Terminology

3.1 *Definitions:*

3.1.1 See also Terminology D5681.

3.1.2 *field records, n*—information written in a field log book or loose leaf sampling forms at the time of sampling.

4. Significance and Use

4.1 This practice can be used in sampling ash from a kiln or incinerator, soils, and process waste from conveying systems, such as, a conveyer and vertical lifts. Some slurries, such as the bottom solids, can be sampled from the quench waters at the end of a kiln.

4.2 This practice can be used to determine material balances for burner efficiency studies and compliance studies.

4.3 This practice can be used on lifts, sloping, and horizontal conveyor systems. The type of conveyor and the amount and type of sample required will dictate the type of sampling equipment required to get a representative sample.

4.4 The sample is taken directly from the conveyor before emptying into the waste container or pile for disposal or recycling using a scoop, dipper, or shovel depending upon the sample requirements (see Practice D5633). The sample is then put into the sample container for analysis.

[1] This practice is under the jurisdiction of ASTM Committee D34 on Waste Management and is the direct responsibility of Subcommittee D34.01.02 on Sampling Techniques.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For Annual Book of ASTM Standards volume information, refer to the standard's Document Summary page on the ASTM website.

[3] The last approved version of this historical standard is referenced on www.astm.org.

4.5 The place, quantity, frequency, and time of sampling is dependent upon the conveying system equipment, data quality objectives (DQOs) (Practice D5792), work or sampling plan (See Practice D5283 and Guide D4687), and analysis to be run.

4.5.1 Large particles can be mechanically excluded on a belt system. Large particles may accumulate at the bottom of an inclined/sloped belt system. Therefore, steps, if possible, need to be taken so that particles of all sizes have equal chances of being sampled.

4.5.2 The number of samples and sample time is dependent upon the system, the precision required, the decisions that are to be made, the cost, and the degree of heterogeneity of the material (see Guide D5956, Practice D6250, and Guide D6311).

4.5.3 In general, the ideal sampling location is nearest to the point of generation since temperature, oxidation, and air movement may change some samples with time.

4.6 The practice does not address issues related to the heterogeneity of the sample.

5. Sampling Equipment

5.1 The scoop, dipper or shovel must be manufactured from material that is compatible with the waste to be sampled, and the required test or analysis to be performed (see Guide D6232).

5.1.1 Sampling equipment must be selected that is chemically compatible with the type of waste and type of analyses. Stainless steel, glass, and plastic are generally acceptable for most samples. Plastic sampling equipment may not be suitable for waste to be analyzed for organic parameters. It is up to the user to ensure that the equipment will not contaminate or bias the analyses.

5.1.2 The reuse of equipment without proper cleaning can result in false positive analysis. If proper equipment cleaning cannot be accomplished in the field, additional sets of sampling equipment are needed to prevent potential cross-contamination.

5.2 A fixed auger may be present on a conveyor system and may be used to collect samples (see Practice D4916).

5.3 If the DQO, work, or sample plan calls for samples to be composited, a composite collection container may be needed. The composite collection container will allow mixing and quartering of the sample materials for compositing if it is going to be done at the sampling site. Use of a composite collection container for sub-sampling may result in particle size segregation and result in a bias if the material is not homogeneous or sampling not performed correctly.

6. Sample Containers

6.1 Plastic, glass, or other non-reactive containers should be used as specified by the site sampling plan (see Guide D4687).

6.2 Sampling for volatile organics in waste requires special handling (see Practice D4547).

7. Procedure

7.1 The procedure used will depend upon the type of conveyor system or lift to be sampled.

7.1.1 Many bucket conveyors and augers are enclosed systems which make sampling of the moving conveyor impractical. Samples may be taken at the end of the conveyor as the sample drops into the waste pile or waste container (See 7.4 for the method of sampling).

7.1.2 The bucket conveyor catches almost everything making representative sampling of a heterogeneous sample difficult. A bucket conveyor cannot always be sampled while moving due to the depth of the bucket and the difficulty in getting a core sample of the bucket versus the liquid portion. Sampling as the material is being dumped is the easiest method of sampling a bucket conveyor (See 7.4).

7.1.3 A tray conveyor system allows the sample to be taken after the quench (sampling a burner ash) using a flat scoop or flat shovel which samples the tray to the bottom as the material moves toward the end of the conveyor. The tray conveyor system usually does not move too rapidly to be sampled while moving. This allows for sampling of the tray by taking a sample of the complete tray and putting the sample into the sample container (see 7.3 for sampling method).

7.1.4 A belt conveyor can be sampled using scoop, dipper, and shovels. If the material is heterogeneous a mixing step may be required to determine the average over time sample.

7.1.4.1 If the belt conveyor is tilted, larger particles tend to roll to the bottom of the conveyor. The inclusion of the larger materials should be considered in the sampling plan or DQO process. The larger material may require grinding or other size reduction techniques before being sent to the laboratory.

7.2 *Sample Collection:*

7.2.1 Review the work or sampling plan.

7.2.2 Check to make sure that the supply of sample equipment, including but not limited to containers, labels, ice chests, and composite collection containers, are adequate and correct. Field logbooks or sampling forms (field records) shall be provided to document the sampling time, the amount of sample, sample observations, explanations, sample designation number, run number, “if required”, and have a place for signature or initials of sampling personnel.

7.2.3 Provision should be made for field blanks, split samples, and field spikes.

7.2.4 Special safety precautions should be taken while sampling the conveyor due to moving equipment and the exposure to the sample under semi-controlled conditions.

7.2.5 The sampling device must be of a size and shape suitable for the quantity and size of the particles to be sampled. For example, a flat bottomed scoop or shovel is more desirable than a round bottomed sampling device to capture the full depth of the waste being carried on a belt or tray conveyor. An extension to the sampling device is often employed to assist the sampler in safely collecting the samples.

7.3 *Sampling Open Belt and Tray System:*

7.3.1 At the time specified, insert the sampling device into the waste stream and withdraw the sample from the conveyor. When sampling an open belt system, care must be taken to avoid tearing, snagging, or otherwise damaging the belt (see Guide D4687). If the conveyor belt can be stopped safely, two bulkheads can be cut from plywood or other material to fit across the conveyor surface to prevent the materials from