Designation: D5013 – 18

Standard Practices for Sampling Wastes from Pipes and Other Point Discharges[1]

This standard is issued under the fixed designation D5013; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 These practices provide guidance for obtaining samples of waste at discharge points from pipes, sluiceways, conduits, and conveyor belts. The following are included:

	Sections
Practice A – Liquid or Slurry Discharges	7–9
Practice B – Solid or Semisolid Discharges	10–12

1.2 These practices are intended for situations in which there are no other applicable ASTM sampling methods (see Practices D140/D140M and D75/D75M) for the specific industry.

1.3 These practices do not address flow and time-proportional samplers and other automatic sampling devices.

1.4 Samples are taken from a flowing waste stream or moving waste mass and, therefore, are descriptive only within a certain period. The length of the period for which a sample is descriptive will depend on the sampling frequency and compositing scheme.

1.5 It is recommended that these practices be used in conjunction with Guide D4687.

1.6 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.* See Section 5 for more information.

1.7 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D75/D75M Practice for Sampling Aggregates
D140/D140M Practice for Sampling Asphalt Materials
D4687 Guide for General Planning of Waste Sampling
E882 Guide for Accountability and Quality Control in the Chemical Analysis Laboratory

2.2 *EPA Standard:*[3]

EPA-SW-846 Test Methods for Evaluating Solid Waste, Physical/Chemical Methods

3. Summary of Practices

3.1 The variability of the waste stream is first determined based on: (*1*) knowledge of the processes producing the stream, or (*2*) the results of a preliminary investigation of the waste stream's variability. A sampling design is then developed that considers the waste stream's variability, the time frame the sample is to represent, and the precision and accuracy required for waste analysis or testing. The actual sampling procedure consists of obtaining several grab samples from the moving stream or mass for analysis or testing.

4. Significance and Use

4.1 The procedure outlined in these practices are guides for obtaining descriptive samples of solid, semisolid, and liquid waste from flowing streams, and incorporate many of the same procedures and equipment covered in the Referenced Documents. These practices by themselves will not necessarily result in the collection of samples representative of the total waste mass. The degree to which samples describe a waste mass must be estimated by application of appropriate statistical methods and measures of quality assurance. It is recommended that those practices be used in conjunction with Guide D4687.

[1] These practices are under the jurisdiction of ASTM Committee D34 on Waste Management and are the direct responsibility of Subcommittee D34.01.02 on Sampling Techniques.

Current edition approved Sept. 1, 2018. Published October 2018. Originally approved in 1989. Last previous edition approved in 2016 as D5013 – 16. DOI: 10.1520/D5013-18.

[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] Available from United States Environmental Protection Agency (EPA), William Jefferson Clinton Bldg., 1200 Pennsylvania Ave., NW, Washington, DC 20460, http://www.epa.gov.

5. Hazards

5.1 In all sampling practices, safety should be the first consideration. Personnel involved in the sampling should be fully aware of, and take precautions against, the presence of toxic or corrosive gases, the potential for contact with toxic or corrosive liquids or solids, and the dangers of moving belts, conveyors, or other mechanical equipment. Guidance on waste sampling safety can be found in Guide D4687.

6. Sampling Design

6.1 The frequency of sampling and the number of composites required to obtain a sample of the waste will depend on the following:

6.1.1 Time variability of the waste composition,

6.1.2 Time span which the sample is to represent, and

6.1.3 Precision of waste analysis that is required, for example, if a hazardous constituent is present in the waste at levels near the regulatory limit or another limit of concern, then better precision will be required than if the levels are well below or well above the limits of concern.

6.2 The processes that produce the waste will largely dictate the variability in the composition of the waste. If the processes are known to be constant and reliable, then fewer samples should be required than from a highly variable process.

6.3 To obtain a descriptive sample of the waste, the concentration levels and approximate variation in the waste composition should first be estimated. In some cases, a rough estimate can be made based on knowledge of the processes that produce the waste. In other cases, results from previous sampling efforts can be used to estimate waste composition and variability. A preliminary pilot sampling effort may be necessary to establish the waste composition prior to designing the primary sampling program. Procedures for estimating sample variability and for establishing a sampling design are provided in Guide D4687.

6.4 The sampling design should include quality assurance procedures. At the least, this should include the following:

6.4.1 Sample handling quality control by carrying a blank sample through all of the sampling and analytical steps, and

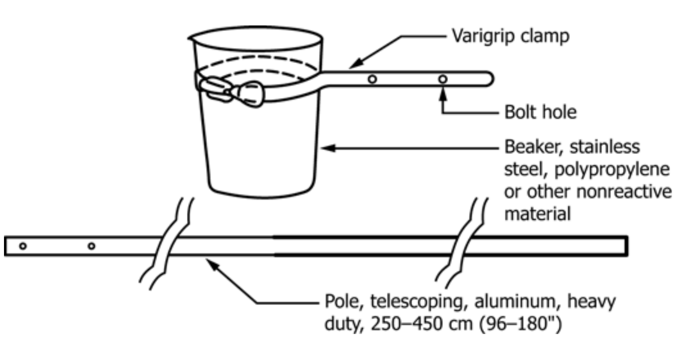
6.4.2 User should be aware of the laboratories' internal quality control procedures. More rigorous quality assurance/quality control procedures may be required, depending on the particular data quality objectives of the sampling program. For further information on quality assurance/quality control, see Guide E882 and EPA-SW-846.

6.5 A sampling plan should be prepared prior to sampling. The plan should describe such things as: (*1*) safety procedures; (*2*) sampling design, including number and location of samples; (*3*) data quality objectives and quality assurance procedures; (*4*) apparatus; (*5*) sampling procedures; and (*6*) sampling labeling and handling. The details of the sampling procedure should consider all aspects of the specific discharge, including pipe diameter, velocity, rate of discharge, solids content of the discharge, requirements for grab or composite samples, and ultimate use of the analytical data.

PRACTICE A – LIQUID OR SLURRY DISCHARGES

7. Apparatus

7.1 *Dipper Sampler*—For slurry and liquid discharges, a dipper type sampler should be employed. One example of this type of sampler is depicted in Fig. 1. The dipper can be varied in size, depending on the flow rate from the pipe or sluiceway. This procedure should not be used for high stream flow velocities or rates (>100 gal/min), because problems will arise in physically holding the dipper in the stream. Stream dimensions and size and shape of pipe should also be considered in addition to flow rate. The sample should be taken across the full opening of the stream in as short a time as possible. This will minimize the effect of changes in composition of the waste stream due to density differentiation, laminar flow, and the like.



Source: Test Methods for Evaluating Solid Wastes, U.S. EPA-SW-846, July 1982.

FIG. 1 Dipper Sampler

8. Procedure

8.1 Clean the beaker and container for compositing sample by methods appropriate for the analysis to be performed. Cleaning the equipment is especially important to prevent cross-contamination between different waste types. In some cases, it may be necessary or simpler to dedicate equipment to a specific waste type.

8.2 Assemble the sampler by clamping the beaker to the pole.

8.3 Make sure that the sampler matches the dimensions of the discharge stream if at all possible. If not, pass the dipper in one sweeping motion through the discharge stream at a rate such that the dipper is filled in one pass. Make enough passes to cover the entire cross-sectional area of the discharge stream.

8.4 If the entire discharge width cannot be covered in one pass, additional passes will be needed. Begin each additional pass at the ending point of the previous pass. It may be necessary to make a few trial passes or practice runs before actually sampling the discharge. If compositing of samples is