air pollution control district
SANTA BARBARA COUNTY

Guidance Document for Silt Loading / Silt Content Sampling Plans

Santa Barbara County Air Pollution Control District — November 2026

This document and the District's *Guidance Document for Soil Moisture and Silt Content Sampling Plans* (November 2026) together supersede *Requirements for Soil Moisture and Silt Content Sampling Plan* (September 2020).

1. Applicability

This document applies when a sampling plan establishes or verifies a silt loading (g/m^2) on paved roads, or a silt content (percent) of a bulk material, and no soil moisture determination is required. Examples include verification of a permit-condition silt loading limit and development of silt inputs to the AP-42 Section 13.2.1 paved road emission factor. If water is used for dust control and a moisture-dependent control efficiency is claimed, use the District's *Guidance Document for Soil Moisture and Silt Content Sampling Plans* for those sources. A facility with both source types (for example, paved road silt loading verification and watered unpaved roads) should use this document for its paved roads and the *Guidance Document for Soil Moisture and Silt Content Sampling Plans* for its watered sources.

2. Plan Submittal

Prepare a silt content sampling plan for the District's review and approval prior to sampling. Use USEPA's AP-42 Appendix C.1, *Procedures for Sampling Surface/Bulk Dust Loading* (https://www.epa.gov/sites/default/files/2020-11/documents/app-c1.pdf), and Appendix C.2, *Procedures for Laboratory Analysis of Surface/Bulk Dust Loading Samples* (https://www.epa.gov/sites/default/files/2020-11/documents/app-c2.pdf), for developing the sampling plan. The District's *Source Test Procedures Manual* (https://www.ourair.org/wp-content/uploads/srctest.pdf) provides guidelines for preparing a testing plan.

3. Sample Locations and Number of Samples

a. Collect one sample per 0.5 mile of road segment length, or portion thereof, for each road segment (AP-42 Appendix C.1). The District may require additional sample locations on a case-by-case basis, including for compliance verification programs. For paved roads, each sample is a composite of at least three increments, full-width strips within the marked location, combined into one container and analyzed as a single result. Collect additional increments as needed to meet the 200 g minimum in Section 4.

b. Document the centerline length of each road segment in the plan. A GIS or aerial-imagery measurement (e.g., Google Earth) is acceptable; survey-grade accuracy is not required for the 0.5-mile determination. Sample counts cannot be verified without documented segment lengths.

c. Select locations randomly or with District concurrence. Place locations toward mid-segment; avoid segment boundaries adjacent to trackout sources such as pad aprons and intersections.

d. Provide a diagram of the proposed sample locations overlaid on an aerial photograph, with a separate detailed diagram if needed.

e. Mark locations by a method that does not introduce fine material (i.e., no chalk, paint applied outside the collection area or fully cured before sampling). Targeted cleaning of marked locations outside of normal, full-section control activity is prohibited. Do not sample the same marked increment more than once per week; rotate increments between events.

4. Field Procedure — Paved Roads (Silt Loading)

a. Each sample increment spans the full traveled lane width, "white line to white line," excluding berms, centerline mounds, curbs, and untraveled pavement, in a strip 0.3 m to 3 m wide (AP-42 Appendix C.1.2). A fixed 1 m × 1 m square is not acceptable: silt loading varies systematically across the lane (wheel tracks versus lane center), so a single square is not representative of the traveled surface.

b. Collect with a vacuum fitted with tared filter bags. The sample must weigh at least 200 g, and the exposed bag must weigh at least 3 to 5 times the empty bag tare weight. Vacuum additional areas until these specifications are met, following the "white line to white line" guidance in step 4.a above; on well-controlled pavement, on the order of 900 to 1,000 square feet may be required. Record the total vacuumed area for each increment. A recovered mass below 200 g may result in the requirement to re-sample.

c. A low recovered mass does not default to a finding of compliance. In all cases, silt loading is computed as the sieved sub-No. 200 mass divided by the total vacuumed area.

d. Sample dry surfaces only. If a surface is wet or damp, defer the run until the surface is dry and document the deferral. **A wet surface shall not be recorded as zero silt loading or averaged into a compliance result.**

e. Where sweeping or another control is used, structure the sampling runs around the control cycle. The District has accepted a three-run structure: immediately before the daily sweep; 30 to 60 minutes after sweep completion; and at or near the forecasted daily high temperature, with at least one run after the control is applied.

5. Field Procedure — Unpaved Roads and Storage Piles (Silt Content)

a. Unpaved roads: Select locations and collect per AP-42 Appendix C.1.1. Collect loose surface material across the traveled lane to a depth of approximately 1 cm, or the diameter of the largest particle, whichever is less; do not abrade the road base. Collect a gross sample of 5 kg to 23 kg from uncontrolled surfaces; collect a minimum of 400 g from controlled surfaces.

b. Storage piles: Select locations per AP-42 Appendix C.1.3 based on pile size. Each sample is a composite of increments: a minimum of six increments distributed among the top, middle, and bottom of piles that can be scaled (climbed) by a person carrying a shovel and pail, or a minimum of ten increments collected as near to mid-height as practical for piles that cannot (AP-42 Appendix C.1.3). Collect a minimum sample mass of 5 kg. Report pile surface area and average height.

c. Split bulk samples per Appendix C.2.1 to a laboratory sample of 400 to 1,600 g.

6. Laboratory Analysis

a. Silt is determined by mechanical dry sieving per AP-42 Appendix C.2. Hand sieving is not accepted. Use a mechanical sieve shaker in 10-minute cycles, reweighing the pan after each cycle until successive weighings change by less than 3.0 percent (maximum 40 minutes). **The sieve stack must include the No. 20 and No. 200 sieves with a bottom pan.** The balance must be readable to 0.1 g or better; record the balance make, capacity, smallest division, and calibration date.

b. Paved-road vacuum samples are analyzed as received and are not oven-dried (Appendix C.2.2). Bulk samples (unpaved roads, storage piles) are oven-dried before sieving; if the moisture content itself is needed, use the District's *Guidance Document for Soil Moisture and Silt Content Sampling Plans*.

c. ASTM equivalence: A laboratory may use certain standard ASTM methods that have been determined to be equivalent to the AP-42 Appendix C.2 procedure when run with the modifications stated below:
    i. ASTM C136: Acceptable with the following modifications: run entirely dry, with no washing, wetting, or dispersant at any step; no companion C117; stack includes the No. 20 and No. 200 with a bottom pan; mechanical shaker with the Appendix C.2 endpoint above; per-sieve masses, sub-No. 200 mass, and losses reported with bench sheets; and each laboratory sample tied to its field increment identifier and vacuumed area.
    ii. ASTM D421: Acceptable as dry preparation only; do not grind individual grains.
    iii. Not acceptable: ASTM D1140 and C117 (wash methods); D422 (withdrawn); D6913 as routinely performed (washed minus-No. 200); D2217 (wet preparation); and D7928 (dispersed-suspension hydrometer).
d. Third-party laboratory: If an approved on-site mechanical sieving device is used, at least one independent third-party laboratory analysis is required during the source compliance demonstration period and annually thereafter, to verify the on-site results (split or duplicate samples analyzed by both the on-site device and the laboratory). If no mechanical sieving device is obtained, all samples must be analyzed by an independent third-party laboratory.
e. Provide chain of custody from field to laboratory. Laboratory reports must include bench sheets.

7. Data Reduction and Compliance Comparison

a. State in the plan how sample increments combine (the number of increments composited into each sample); how multiple sample locations within a segment are averaged; how runs within a sampling event are averaged; and the calculation, with units, from sieve masses to the reported silt loading or silt content.
b. For compliance comparisons, results are averaged within a road segment across the runs of a sampling event and compared with that segment's limit.
c. Calculate unrounded; round the final average to the precision of the applicable limit before the comparison for compliance determination.

8. Sampling and Reporting Parameters

Record and report, at minimum:

a. Diagram of sample locations (aerial overlay per Section 3);
b. Road segment identifiers and documented lengths;
c. Date and time of each run;
d. Ambient temperature during each sampling;
e. Traffic:
    i. Traffic volume in vehicles/hr;
    ii. Number of vehicles between samplings;
    iii. Vehicle types (e.g., route trucks, non-route trucks, non-route trucks with trailers);
f. Vacuumed area and recovered mass for each increment;
g. Sub-No. 200 mass for each sample;
h. Calculated silt loading (or silt content) and segment averages;

i. A log of any water or chemical application to the sampled sections (date, time, chemical type, equipment) sufficient to demonstrate the dry-surface requirement; and

j. Laboratory bench sheets and chain of custody.