



SOURCE TEST POLICY

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1. **INTRODUCTION:** This policy provides guidelines for facilities and contractors to plan and conduct source tests and report the results. The intent of the policy is to provide the District with sufficient, reasonable, and clear information to determine compliance of a process or device with permit conditions, emission limits, or other requirements specified in San Luis Obispo County Air Pollution Control District (District) Rules and correspondences.
2. **SUMMARY:** A source test plan should be a stand-alone document. It should provide a concise, complete, and easy to follow description of the methods used for testing a device or process to demonstrate regulatory compliance. It should describe the device to be tested; test conditions; approved sampling and analysis protocols; approved changes; and a timetable for sampling, analysis, and submitting the final report. All plans must receive District approval. Changes identified by the District must be incorporated during testing.

The source test must be conducted according to the approved plan and schedule and include additional requirements such as minimum operating loads or throughput rate achieved during the previous year. The test must be conducted at operating conditions specified in the permit(s) to operate such as minimum destruction temperatures, maximum flow rates, or other agency requests to demonstrate compliance. Unless otherwise approved, tests should be conducted during normal District business hours and witnessed by a District representative. **The District must be contacted well in advance of changes to the schedule proposed in the approved test plan test** so that District observation can be scheduled. The facility must provide a representative, knowledgeable of the devices or process tested, throughout the source test.

The source test report should document implementation of the plan and any additional requirements or deviations that apply. The report should provide a complete summary of all test results, the equations used to derive the results, documentation such as continuous emissions monitor (CEM) or process data and lab reports, and confirmation whether or not the device or process was in compliance. The report should be concise, complete, and easy to follow; leading the reader from the final results through the calculations to the documentation of supporting data in a clear manner.

Section 6 includes a list of common definitions and terms to help clarify this policy.

The District reserves the right to be flexible in the application of this policy in response to the needs of any particular source test plan or condition that might arise during a source test.

3. **SOURCE TEST PLAN:** An electronic PDF* copy or other APCO approved format of the plan must be received by the District in final form at least thirty (30) calendar days prior to the proposed test. Supporting documentation in PDF form should be included unless readily available online and exact website location is listed. Approval of a plan by the District does not relieve an owner or operator from any additional testing, sampling, or reporting requirements specified in the permit(s) to operate

or other written request or requirements imposed by the District or other governmental agency. In other words, an omission or error in a test plan cannot relieve a source from an applicable requirement. In addition, the District may request additional information based on observations made during the test to support the accuracy of the test results. This information must be included in the final test report.

The plan must at least contain the following:

- a. The name, address, telephone number, and contact of the company for whom the source test is being conducted, the company performing the test, and company completing the analyses.
- b. The permit number(s) and description of the device(s) to be tested with a listing of all pollutants to be sampled or monitored and indicating the respective regulatory limits. Include a listing and description of other process or system variables that will be monitored to determine compliance.
- c. A list and brief summary of the Air Resources Board (ARB) or U.S. Environmental Protection Agency (EPA) sampling, monitoring, and analytical protocols for each pollutant. Modifications must be clearly described and include an engineering justification.
- d. Three (3) replicate samples are standard, except where the test method to be performed explicitly allows for a different number of replicates. No fewer than two (2) replicates are permitted.
 - 1) If three replicates are proposed and approved in a test plan, an owner/operator may not shorten the actual testing to two replicates, regardless of any indication of compliance or non-compliance during actual testing.
 - 2) An owner/operator that satisfies all of the following criteria may propose two replicates in a test plan.
 - i. The results of at least two previous test events were no more than 80% of the applicable emission limit.
 - ii. The facility to be tested is not a federal source (Title V, Synthetic Minor or subject to NSPS or MACT) or has compliance issues, as determined by the District.
 - 3) If two replicates are approved, and during actual testing either of those two test runs exceeds 80% of an applicable limit, a third replicate shall be performed.
 - 4) If two replicates are performed, the higher of the two values is considered the actual value, regardless of magnitude. Two replicates shall not be averaged.
- e. A diagram and brief description of the sampling train and major components of the monitoring system. If common, standard equipment is used, the diagram is optional.
- f. A simplified diagram of the stack or device to be tested including relevant dimensions and locations of flow disturbances and sample ports.
- g. A brief summary describing the instrument or monitor equipment calibration procedure.
- h. Confirmation that calibration gases and equipment calibration will comply with the requirements of ARB Method 100 and will include three-point calibration checks. In addition, a calibration gas shall be proposed in the test plan to allow quantification of a measurement that is 150% of an

applicable limit. Where expected or actual concentrations are near zero or emission spiking is anticipated, alternatives may be proposed.

- i. A brief description of instrument and system leak check and system bias check frequencies.
 - j. The test sequence of events and proposed timetable including equipment set up time.
 - k. Sample calculations and units of measure for each calculation to be performed. All constants and conversion factors must be clearly defined and include units of measure. District standard conditions are 60°F and 14.7 psia.
 - l. Results must be presented in units of measure that are consistent with all applicable emission limitations so that compliance can be readily determined. In addition, for emission inventory purposes, combustion source emissions should be reported in units of pounds per million Btu and particulate source emissions should be reported in units of pounds per ton of throughput.
 - m. Operating conditions during the test. Include the parameters to be monitored, the method of monitoring, and the frequency of data collection. Process data must be recorded at least every five minutes during sampling. Longer time spans may be proposed and may be accepted, if justified.
 - n. A brief quality assurance (QA) plan including how any sample removed from the site will be stored and transported.
 - o. A summary table listing: the devices to be tested, the pollutants for each device, the sampling method(s) for each pollutant, the test duration, the number of replicates, the sample size, the method(s) of analysis, and the permit limits.
 - p. All potential sources of error should be clearly identified and quantified (such as calibration gas certified to $\pm 1\%$, allowable calibration drift equal to 2%, etc.)
 - q. A table summarizing the allowable analyzer calibration error, zero drift, calibration drift, and sampling system bias for each applicable test method.
 - r. A statement describing the expected operating rate. For combustion processes, operating rate shall be determined by multiplying the fuel flow rate at the time of the test by the higher heating value of the fuel on a dry basis. An alternative measure may be used with prior District approval. All processes or devices shall be tested at 100% of the maximum process rate or permit limit, unless otherwise approved by the District. The intent of the source test is to determine the emissions from a process or device at the point of maximum emissions, excluding upset conditions.
 - s. Each page shall be identified with a unique number, including appendices and attachments.
4. **SOURCE TESTING:** A source test must not be conducted without a District-approved plan. The owner/operator is responsible for ensuring that the test is run according to that plan and any additional requirements imposed by permits, the District, or other governmental agencies. Plan changes must have District approval before implementation and must be documented in the test report.

A company representative, familiar with the operation of the device or process and test procedures, must be available throughout the test to answer questions and ensure proper operating and testing. To ensure that compliance is evaluated under worst case conditions (i.e., those representing the highest emitting operation allowed under a permit), tests must be run at 100% of the maximum process rate or the permitted rate, unless otherwise described in the District approved plan. The District recognizes that 100% of capacity may not always be achievable and may approve a lower operating rate depending on the justification provided for the lower rate.

NOTE: Testing at a reduced process rate may result in a permit restriction to that production level achieved during testing, because compliance will not have been shown at higher rates. Also, if a test is justified and conducted at a reduced process rate, and then subsequent operation occurs above that rate, the District may take enforcement action against the source for having failed to properly conduct the compliance test.

Under no circumstances may the process rate be reduced solely because of testing. If an upset occurs, the District may approve suspending a test until normal conditions are re-established, depending on the sensitivity of the sampling method to interruption.

A test shall not be canceled or aborted solely because a device appears to be out of compliance. Any indication of non-compliance should trigger the following actions:

- a. In general, the first step should be to contact the APCD's Enforcement Division to discuss upset/breakdown relief and/or emergency variance. The second step is to take the appropriate action to protect the health and safety of plant personnel/equipment and the public.
- b. If a District observer is present, they should contact the District's Enforcement Division supervisor to determine if breakdown relief should be sought. If that contact cannot be made, three replicate test runs shall be completed unless the non-compliant emission is threatening the health and safety of facility personnel and/or the public.
- c. If a District observer is not present, the owner/operator shall contact the District's Enforcement Division supervisor to determine if breakdown relief should be sought. If that contact cannot be made, three replicate test runs shall be completed unless the non-compliant emission is threatening the health and safety of facility personnel and/or the public.
- d. All District contacts or attempted contacts, the basis for any decision that the health and safety of individuals was threatened, all test measurements, and all results concerning canceled or aborted tests must be included in the final report.

If during testing an emission rate exceeds an instrument's scale, then a higher scale sufficient to measure the emission rate shall be used. If the highest concentration calibration gas available is insufficient to calibrate the necessary scale, that gas shall still be used to adjust the scale to be as accurate as possible. Testing shall not be discontinued solely because the magnitude of the emission rate results in the use of an instrument scale that cannot be calibrated relative to a reference standard.

A copy of the approved plan and supporting information, such as EPA or ARB protocols, must be maintained at the test location and be made available to the District and any sampling personnel upon request. Sampling personnel must be knowledgeable in the use of the equipment and sampling protocols and be available to answer relevant questions.

All sampling activity including modifications or deviations in the scheduled test must be reported. All results including preliminary calculations must be documented. Results of any test run in parallel to the scheduled test and used to calculate or evaluate any portion of the scheduled test must be reported.

Leak checks must be consistent with ARB Method 100, or approved plan, and include a full system check at the start and finish of each sampling run. The probe should be plugged and a higher vacuum drawn through the sampling train (or CEM) than that used during the test. Vacuum readings must be confirmed by use of a vacuum gauge or similar readable instrument. Reliance solely on the movement of rotometers is not acceptable. Alternate methods for determining sampling system leak integrity must receive prior District approval.

Span or zero gas should not be introduced until the system has been proven to be leak free. At least one span gas must be used to calibrate the equipment in the expected range of each monitored pollutant. If an instrument range or scale is changed during testing, span checks on the new range must be performed before the end of that test.

A minimum of one system bias check must be performed before and after each replicate test series. Calibration gas must contain at least one of the main pollutants of interest at a concentration consistent with the requirements of ARB Method 100 or the applicable test method. The gas must be entered into the sampling probe before and after a test series to ensure that the test apparatus is responding in an appropriate manner. The system bias check shall not exceed 5% or value specified in the test method.

Chart recordings and computer files shall contain the following data in readable form:

- a. The start and stop time and date of the test.
 - b. The company name and the name of the device tested.
 - c. The chart speed, full scale value, chart offset setting, and sampling rate.
 - d. The identification of each curve. Identification of a curve by color is not acceptable unless a color reproduction of the chart is included.
 - e. Zero check, drift, span calibration and system leak and bias check. Include calibration gas values.
 - f. The name of the sampling person.
 - g. A clear notation for each anomaly and deviation.
 - h. The page sequence for graphs and charts going beyond a single page.
5. SOURCE TEST REPORT: An electronic PDF* copy or other APCO approved format of the complete final report must be received by the District within forty-five (45) calendar days of the test conclusion. The following elements must be included in the report:
- a. The name, address, contact name, and telephone number of the company for which the testing was completed, the testing company, and the company completing the analyses.
 - b. A brief description of the device tested, the reason for testing, regulatory limits for the device,

and permit number.

- c. A description of all differences from the test plan with an engineering justification.
 - d. An explanation of any testing anomalies experienced.
 - e. A description of interrupted or incomplete tests with an engineering justification.
 - f. A record of all pertinent operating and process conditions during the test, including process print outs, if available. Process and operating data must be recorded at least every five minutes during sampling unless an alternative reporting period is approved by the District.
 - g. A summary table of all required test results and applicable regulatory limits (see item 3.l above). The table should clearly indicate whether or not the device is in compliance, and must include page references specifying the location of supporting data such as CEM summaries, analytical lab results, and calculations.
 - h. An example of each unique calculation with all units of measure and conversion factors. All numbers must be easily traceable by page reference to the raw data upon which the result is based.
 - i. Copies of all data sheets, logs, analytical results, calculation sheets, and similar documents are to be appended to the report and referenced in the text.
 - j. An analysis of the accuracy and precision must be completed for any result that is greater than or equal to ninety-five percent (95%) of an applicable limit. Actual test data should be used to derive the accuracy and precision of the reported results. The equations and methods used to calculate the test accuracy and precision should be referenced and clearly shown.
 - k. Verification in the form of a table that each process or device was operated at the level defined in item 3.r above during the source test. The table must list each process or device tested and show the permitted or design rate, the maximum historic operating rate for compliance purposes only, the rate at which the unit was tested, the percent of the rate, and the calculation used to determine the percent of the rate.
 - l. Each page including appendices and attachments shall be numbered.
6. **DEFINITIONS:** The following terms are commonly used in source testing. Many of the definitions are consistent with those in SW-846, 40CFR60, and 40CFR72.2. Similar terms used in source test plans or reports must be consistent with those stated below, unless they are clearly defined in the report or plan.
- a. **Accuracy:** The closeness of agreement between an observed value and an accepted reference value. When applied to a set of observed values, accuracy will be a combination of a random component and a common systemic error (or bias) component.
 - b. **Bias, Instrument:** An error resulting in instrument measurements that will be either consistently high or consistently low to the reference value.
 - c. **Bias, System:** A systematic error resulting in measurements that will be either consistently high or consistently low to the reference value.

- d. Calibration Drift or Drift: The difference in the CEMS output readings from the established reference value after a stated period of operation during which no unscheduled maintenance, repair, or adjustment took place.
- e. Calibration Error: The difference between CEM values and known values of a series of calibration gases or the response of a flow monitor to a reference signal and the known value of the reference signal.
- f. Calibration Gas: A standard reference material; a National Institute of Standards and Technology (NIST) traceable reference material; a Protocol 1 gas; a research material; or a zero air material.
- g. Estimated Quantification Limit (EQL): The lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. The EQL is generally 5 to 10 times the MDL.
- h. Leak Check: The application of appropriate test procedures to verify the integrity of all components, sample lines, and connections. For components upstream of a sample pump attach the probe end of the sample line to a manometer or vacuum gauge, start the pump and pull greater than 50 mm (2 in.) Hg vacuum, close off the pump outlet, and then stop the pump and ascertain that there is no leak for at least one minute.
- i. Linearity: The maximum deviation between a mid-range calibration reading and the reading predicted by a straight line drawn between high-range and zero gas calibration points, as a percent of the range.
- j. Maximum Historic Operating Rate: The maximum rate at which a piece of equipment to be tested has been operated during the twelve months prior to the source test. The maximum operating rate does not include unusually high rates that might have occurred over periods of time less than one hour due to upset or uncontrolled conditions. The maximum historic operating rate is used by the District to verify compliance with operational limits established in permits to operate, rules, or other District correspondences.
- k. Method Detection Limit (MDL): The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte.
- l. Precision: The closeness of a measurement to the actual measured value expressed as the uncertainty associated with repeated measurement of the same sample or of different samples from the same process without assumption of the knowledge of the true value. A measurement technique is determined to have increasing precision as the variation among the repeated measurements decrease.
- m. Rate: The level at which a piece of equipment is utilized as determined by fuel consumption, steam production, or other District-approved variable for combustion processes and by throughput, production rate, or other District-approved variable for non-combustion processes.
- n. Reference Method: Any direct test method of sampling and analyzing for an air pollutant as specified in 40CFR60 or by the California Air Resources Board.

- o. Relative Accuracy (RA): A statistic designed to provide a measure of the systematic and random errors associated with data from CEMS, and is expressed as the absolute mean difference between the pollutant concentration, mass emission (lb/mmBtu) or volumetric flow measured by the pollutant analyzer and/or flow monitor and the value determined by the applicable reference methods ($|d|$) plus the 2.5 percent error confidence coefficient of a series of test results ($|CC|$) divided by the mean of the reference method test results (RM).

$$RA = (|d| + |CC|)/(RM) \times 100$$

- p. Replicate Test Series: Normally three consecutive measurements of a variable of interest under the same process or operating conditions.
 - q. Representative Sample: A sample or series of samples that, when analyzed, accurately reflect the constituent profile and respective concentrations of the components of the material of interest at the 99% confidence level.
 - r. Response Time: The time it takes the CEMS to display 95% of a step change on the data recorder.
 - s. Span: The range of values that a monitor component is required to be capable of measuring, e.g.: 0-500 ppm.
 - t. Span Value: The upper limit of a gas concentration measurement range, e.g.: 500 ppm.
 - u. Standard Conditions: For the San Luis Obispo County Air Pollution Control District, standard conditions are defined as 60°F and 14.7 psia.
 - v. Zero Drift: The difference in the CEMS output reading and the zero calibration value with the introduction of a gas with a zero concentration of the component of interest after a stated period of normal, continuous operation during which no unscheduled maintenance, repair, or adjustment took place.
7. CONCLUSION: Each plan and each report should be a stand alone document clearly defining the test performed, the equipment tested, and the protocols used. The final report should provide an easy to follow paper and calculation trail leading from the raw data to the summary of the final results. By adhering to this guideline, the time required to review the test plan and report should be significantly decreased. Additional costs incurred by the facility and testing contractor for rewriting plans or reports, or repeating tests may also be avoided.

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