

## **STANDARD OPERATING PROCEDURE FOR STACK TESTING PROTOCOLS AND REPORTS**

**1. APPLICABILITY.** This Standard Operating Procedure (SOP) applies to stack testing protocols and reports received by the Bureau of Air Quality (BAQ). This standard operating procedure applies to all staff involved with the receipt, logging and reviewing of both stack test protocols and stack test reports.

**2. PURPOSE.** To establish standardized methods for stack test protocols and stack test reports. Each stack test protocol is valuable to the BAQ as it sets conditions to which a licensee's air emissions units must operate during stack testing. The data from the stack test report will be used to determine compliance with a source's emission limits and may be used for inventory and fee purposes.

### **3. DEFINITIONS.**

**3.1 AIR EMISSIONS COMPLIANCE TRACKING SYSTEM (AECTS) Database.** AECTS Database means the internal BAQ database used to record and track activities at stationary sources regulated by the BAQ. It is used by Compliance, Enforcement and Stack Testing staff to record data about their activities which uploads to the USEPA Airs Facility System (AFS) database. The emissions data contained in the AECTS database is used by licensing staff and others looking for emissions data information.

**3.2 Emission.** Emission means the release of regulated pollutants into the ambient air, or the regulated pollutants so released.

**3.3 Emissions Unit.** Emissions Unit means any equipment or pollutant-emitting activity of a source which emits or would have the potential to emit a regulated pollutant or hazardous air pollutant. This term is not meant to alter or affect the term 'unit' for purposes of Title IV of the CAA.

**3.4 Facility.** Facility, building, structure, or installation means all of the pollutant-emitting activities which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under the control of the same person.

**3.5 Fuel-burning Equipment.** Fuel-burning Equipment means any furnace, boiler, apparatus, and all appurtenances thereto used in the process of burning fuel, for the primary purpose of producing heat and power, including stationary internal combustion

engines. Due to the process nature of asphalt plants, these are not regulated as “fuel burning equipment”; see General process source or general process equipment.

**3.6 General Process Source or General Process Equipment.** General Process Source or General Process Equipment means any emissions unit, except fuel-burning equipment, incinerators, and mobile sources. Included in this category are rock crushers and asphalt batch plants.

**3.7 Licensee.** Licensee means an owner or operator of a facility or piece of equipment where an Air Emissions License is required.

**3.8 Owner or Operator.** Owner or Operator means any person who owns, leases, operates, controls or supervises a regulated pollutant source.

**3.9 Protocol.** Protocol means a report describing what testing is going to take place, which reference testing method will be employed to perform the testing as well as a timeframe for the testing to occur.

**3.10 Regional Inspector (RI).** Regional Inspector means a person who is assigned to perform compliance inspections for the BAQ in one of the four regional offices within the State.

**3.11 Stack.** Stack means any point in a source designed to emit solids, liquids or gases into the air, including a pipe or duct, but not including flares

**3.12 Stack Test.** Stack Test means a compliance stack test is a stack emissions measurement performed following the procedures specified and developed by the US EPA or other methods approved by the Department. Such testing is required by DEP to be conducted by various stationary sources in the state to determine compliance with the applicable air emission limits and to evaluate the impacts on ambient Air Quality and may be used to determine emissions factors for the units tested.

**3.13 Stack Test Engineer (STE).** Stack Test Engineer means a person who is knowledgeable and responsible for the receipt, review and resolution of any issues that arise with protocols and stack testing. The STE is responsible for implementing SOP’s for stack testing and records retention.

**3.14 Stack Test Observation.** Stack Test Observation means the activity where the STE or RI or both are present during a stack test to ensure that the testing is being performed in conformance with all applicable rules, regulations and the protocol submitted by the licensee. The determination of who observes the stack test is made by following the Stack Testing Protocols and Reports SOP.

#### **4.0 Protocol.**

**4.1** The Protocol shall be submitted to the STE and the RI no less than 30 days prior to the scheduled test date and shall include, if applicable;

- 4.1.1** The facility being tested.
- 4.1.2** The Air Emission License number.
- 4.1.3** The emissions unit and the pollutants that the testing will be performed on
- 4.1.4** The standard methods used for the testing and variation of the methods that must be approved prior to the testing.
- 4.1.5** The date(s) when the testing will be performed.
- 4.1.6** Type and quantity of all fuel consumed in the process including schematics of fuel flow from delivery through all tanks, pumps, and meters to the burners; where appropriate, the type and quantity of raw and finished materials used in the process, including schematics of material flow through all relevant equipment from delivery through finished product.
- 4.1.7** Description of any cyclical or batch operations which would tend to produce variable emissions with time and the impact of such variable emissions on the tested emission rate.
- 4.1.8** All relevant operating parameters used to regulate the process, and parameter values representative of the facility's normal process and operating conditions.
- 4.1.9** Design operating capacity and actual operating capacities of the process (es) representative of the facility's process and operating conditions and which will be maintained during the test.
- 4.1.10** Where applicable, the identification and description of any and all soot blowing equipment found on each boiler and a soot blow schedule (including duration of soot blow cycles) representative of operation for each boiler.
- 4.1.11** Identification and description of the emission control equipment associated with the source to be tested including:
  - 4.1.11.1** Type of emission control device(s), including design capacity and efficiency.
  - 4.1.11.2** Pollutant(s) controlled by the emission control device.
  - 4.1.11.3** All relevant operating parameters used to monitor the performance of the emission control device(s) and parameter values representative of the emission control device's normal operating condition.
  - 4.1.11.4** Identification of all factors having an impact on emission control device performance.
  - 4.1.11.5** Manner in which control equipment is to be operated during the test.

**4.2** A description of the emission sampling equipment including a schematic diagram of the sampling train.

- 4.3** A description of the sampling and analysis procedures. Any variation from an applicable standard Reference Test Method shall be indicated, and justification for each variation from the Reference Test Method shall be provided.
- 4.4** A detailed sketch, with dimensions, indicating the flow of exhaust gases from the process, through the emission control equipment and associated ductwork, to the stack.
- 4.5** Pursuant to 40 CFR, Part 60, Reference Method 1:
- 4.5.1** An elevation view with dimensions of the stack configuration indicating the location of the sampling ports and distances to the nearest upstream and downstream flow interferences.
- 4.5.2** A cross sectional sketch of the stack at the sampling location with dimensions indicating the location of the sampling traverse points.
- 4.6** Estimated flue gas conditions at sampling locations, including temperature, moisture content, and velocity pressure.
- 4.7** A list of the process and control equipment logs and operating data required to document the representativeness of normal process and operating conditions, and which will be collected at regular intervals during the sampling periods.
- 4.8** Copies of all field data sheet forms to be used during the tests including those used to monitor process and emission control equipment operations.
- 4.9** Names and titles of personnel who will be performing the tests.
- 4.10** A description of the procedures for maintaining the integrity of the samples collected, including chain of custody and quality control assurance.
- 4.11** Calibration sheets for the dry gas meter, orifice meter, pitot tube, and temperature gauges and any other equipment used during the testing.
- 4.12** Calibration sheets for all process equipment and parameter monitors from which required data will be recorded.
- 4.13** A list of pre-weighed filters to be used (where applicable) during emission testing, including identification and tare weights.
- 4.14** After the protocol is received by the STE, it will be entered into the AECTS database per the SOP for Electronic Stack Testing Reporting (BAQ-ST-0001). The dates of the stack tests will be entered into the stack testing calendar as well as the name of the person who is observing the stack test, if any.

## **5.0. Protocol Meeting**

**5.1** A protocol meeting may be held between the source, it's consultant, the STE and the RI to discuss the stack test(s) if it is determined that it is appropriate prior to testing.

## **6.0 Stack Test**

**6.1** Stack Tests shall be scheduled with at least 30 days advance notice to the appropriate

BAQ staff. All testing shall be conducted under circumstances representative of the source's normal process and operating conditions. The stack test may be observed by the STE and/or the RI. If it is determined that the stack test will be observed, the flowchart developed by the BAQ (appendix A, attached) will be used to determine who will observe the testing.

## **7.0 Stack Test Report**

**7.1** The Stack Test Report shall be submitted to the STE and the RI within 30 days of the completion of the compliance test, unless otherwise waived by the Department. The stack test report shall be in an electronic media format per the SOP for Electronic Stack Testing Reporting ((BAQ-ST-0001).

**7.2** The Stack Test Report shall contain all pertinent data concerning the tests, including a description of the process and operating conditions under which the tests were made, the results of the tests (including a conclusion of compliance or non-compliance with the applicable standard), and test procedures. While the exact format of the test report may vary according to the source being tested and the Reference Test Method employed for the test, listed below are the elements minimally required in the test report submittal. Note that this list is not necessarily inclusive; additional elements of the test report may be required as necessary to ensure the completeness of the report.

### **7.3 Introduction.**

- 7.3.1** Source identification, location, and date(s) of tests.
- 7.3.2** Purpose of tests.
- 7.3.3** Description of source.
- 7.3.4** Name and affiliation of person in charge of conducting the source test.
- 7.3.5** Certification of responsible facility manager attesting to the representativeness of source operation during the tests.

**7.4** Summary of results. The summary of results shall be submitted in the form provided by the BAQ (appendix B, attached).

- 7.4.1** Operating and emission data reported in the units of the applicable emission standard(s).
- 7.4.2** Comparison with the applicable emission standard.

### **7.5 Source description.**

- 7.5.1** Description of process including operation of emission control equipment.
- 7.5.2** Type and quantity of all fuel consumed in the process during the test(s); and where appropriate, the type and quantity of raw and finished materials used in the process during the test(s).
- 7.5.3** All relevant operating parameters used to regulate the process, and

parameter values recorded during the test(s).

**7.5.4** All relevant operating parameters used to monitor the performance of the emission control device(s) and parameter values recorded during the test(s).

**7.6** Sampling and analytical procedure.

**7.6.1** Description of the sampling train and field procedures.

**7.6.2** Description of recovery and analytical procedures.

**7.6.3** Sketch indicating sampling port locations relative to process, emission control equipment, upstream and downstream flow disturbances.

**7.6.4** Sketch of cross-sectional view of stack indicating traverse point locations.

**7.7** Test results and discussion.

**7.7.1** Detailed tabulation of results including process operating conditions and flue gas conditions.

**7.7.2** Discussion of significance of results relative to operating parameters and applicable emission standards.

**7.7.3** Detailed discussion of and justification for any divergence from normal sampling procedures or operating condition which could have affected test results or the representativeness of the test results.

**7.8** Calculation and data reduction methods.

**7.8.1** Description and presentation of computational methods, including equation format used to obtain final emission results from field data.

**7.9** Appendix.

**7.9.1** Copies of all field data collected during the test(s), including sampling data sheets and process operating logs and charts.

**7.9.2** Copies of all analytical laboratory data, including oil samples, where appropriate.

**7.9.3** Calculation sheets or computer input and output data.

**7.9.4** Sampling equipment and laboratory calibration data.

**7.9.5** Names and titles of all personnel (including operators and supervisory staff) and organizations participating in the test(s).

**7.9.6** Visible Emission observations performed during the test(s) (as applicable).

**7.9.7** Cyclonic flow check data.

**7.9.8** Copies of Continuous Emission Monitor data and/or Continuous Opacity Monitor data collected during the test(s), as applicable.

**7.9.9** All charts, logs, and data sheets shall be clearly marked such that all required information is easily ascertained. All charts, logs, and data sheets shall be clearly marked to indicate the beginning and end of each test run as well as all periods of delay during test sampling.

## **8.0 RULES**

- 8.1** All compliance testing shall be performed in strict accordance with the procedures specified in the Code of Federal Regulations, Title 40, Part 60, Appendix A, Standards of Performance for New Stationary Sources, as amended. A satisfactory test shall consist of three repetitive runs. A fourth "soot-blow" run may be required for combustion sources having intermittent soot blowing. Any variation in the sampling or analytical procedure or alternate test method shall be indicated in the pretest information and receive approval by the Bureau of Air Quality prior to testing.
- 8.2** The Bureau of Air Quality may require that an agency observer(s) be present during all testing and laboratory analysis.
- 8.3** The test location shall be safe for all concerned.
- 8.4** Prior to the pretest meeting, the sampling location shall be inspected by the source for acceptable test conditions and modified if necessary before the compliance test(s).
- 8.5** All emission data submitted to or obtained by the Bureau of Air Quality, including the Protocol and the Stack Test Report shall be available to the public.
- 8.6** All information required to be logged during testing shall be recorded at regular time intervals.
- 8.6.1** For a run of 90 minutes or less - 10 minute intervals.
  - 8.6.2** For a run greater than 90 minutes- 15 minute intervals.
- 8.7** A cyclonic flow check shall be performed prior to each stack test, as applicable.
- 8.8** All testing shall be conducted under circumstances representative of the source's normal process and operating conditions and certified to be representative of normal operation by senior supervisory staff at the testing facility.
- 8.9** Subsequent operation of the source shall be limited by license condition to assure that licensed emission standards are not violated. These conditions shall be based upon the control and process equipment parameters documented during the stack test.