

Part B of Supporting Statement

INFORMATION COLLECTION EFFORT FOR FACILITIES WITH COMBUSTION UNITS

1. Respondent Universe

The vacated Boiler NESHAP and the remanded CISWI standard were developed using a 1997 database of combustion units. The database was built using data from the Industrial Combustion Coordinated Rulemaking “inventory” and additional data received from non-fossil facilities “survey”. These inventory and survey databases contained 3,894 solid fuel fired units and units that fired a combination of solid fuels and other fuels/materials. Since the vacature of the boiler and process heater NESHAP and the CISWI definition rule, the Agency has collected new data through the 2008 Combustion Survey (ICR No. 2286.01, OMB Control No. 2060-0616). As of January 16, 2009, the combustion survey has collected data from 2,537 facilities with boilers, process heaters, other combustion units firing non-fossil fuels/materials, and/or incinerators. Table 1 summarizes the types of combustion units responding to the survey.

**Table 1 Summary of Combustion Units in 2008 Combustion Survey Results**

| Combustion Unit Category                 | Number of Facilities | Number of Combustion Units |
|--|----------------------|----------------------------|
| Major Source Boilers and Process Heaters | 1,550                | 13,103                     |
| CISWI Units                              | 152                  | 211                        |

Note: Some facilities have more than one type of combustion unit so the sum of facilities in each category does not equal the total number of facilities responding to the survey.

The test program for boilers and process heaters at major sources of HAP is summarized in Appendix 1. EPA estimates the portion of the test plan to be a one time cost of \$6.9 million dollars. The test plan for CISWI units is summarized in Appendix 2. EPA estimates the CISWI portion of the test plan to be a one-time cost of \$5.2 million dollars.

1.1 Population of Boilers and Process Heaters at Major Sources

Based on a summary of available data from the survey, the population of boilers at major sources has decreased from 15,900 facilities (58,500 units) in the 1997 ICCR database to 1,550 facilities (13,103 units) in the 2008 combustion survey. Based on a comparison of the database, and tracking of survey respondents, the Agency has concluded that several facilities previously analyzed from the ICCR database have either shutdown, replaced combustion equipment to use less HAP intensive fuels, or have taken a cap on their HAP emissions to avoid being classified as a major source of HAP.

## 1.2 Population of CISWI Units

Based on the combustion survey, the total number of CISWI units is 211. Of these, 126 of the units were reported under the incinerator section (Part IV) of the combustion survey. An additional 78 units were determined to be CISWI units based on the type and origin of materials combusted in the unit provided in the combustion survey. Determinations of CISWI status for these units depended on whether the material combusted within the unit is a waste, as delineated in the January 2, 2009 ANPRM (see 74 FR 41).

In determining the total number of CISWI units, EPA also reviewed responses to question II.C.8 of the survey to determine if a unit indicated it would stop burning a material to avoid being subject to a section 129 rule. If a facility indicated it would stop burning the material, the unit was placed in the section 112 dataset. Because a majority of units answered “unknown” to question II.C.8, EPA assumed, for purposes of test plan development and future regulatory analyses, that if a unit's waste materials were combusted 25 percent or less of a unit's annual operating hours, the facility would, in order to avoid being subject to section 129, stop burning the solid waste and dispose of it in some other manner.

## 2 Respondent Universe Stratification

### 2.1 Stratification of Major Source Boiler and Process Heater Universe

Two variables that appear to have an effect on HAP emissions are fuel/material type and combustor design (for combustion-based HAP such as CO). The emission control device also has an impact on HAP emissions, and EPA selected units with control devices with the highest expected pollutant removal efficiencies for testing within each combination of fuel and combustor design. It should be noted that the process for establishing a MACT floor will take into account the top 12 percent of the best performing units, regardless of control device. Based on initial comments on the test plan during the March 18, 2009 stakeholder meeting, the Agency has removed annual operating hours from the sample design criteria. Hours of operation do not have a direct impact on HAP emissions.

The Agency has stratified the major source boiler and process heater population into 12 different categories for this test plan. The various fuel categories were assigned based on the following hierarchy:

- The coal category includes all units that fire coal fuels either alone, or in addition to other fuels.
- The Wet Biomass category includes all units that fire a wet biomass (bagasse, bark, timber, unspecified biomass), either alone, or in addition to other non-coal fuels.
- The Dry Biomass category includes all units that fire a dry biomass (lumber, plant-based agricultural residue, manure, adulterated biomass from furniture

- or wood products manufacturers, hog fuel), either alone, or in addition to other gaseous, liquid or NF solid or liquid fuels.
- The Non-Fossil solid category includes all units that fire non-fossil solids (i.e., on-site industrial by-products, TDF) either alone or with other gaseous, liquid, or NF liquid fuels.
  - The Non-Fossil liquid category includes all units that fire non-fossil solids (i.e., Black Liquor) either alone or with other gaseous, liquid, or NF liquid fuels.
  - The liquid (heavy) category includes all units that fire fossil-based liquid fuels (No. 4, 5, and 6 fuel oils, used oil (on-spec), and other uncategorized fossil fuel liquids), either alone or with gaseous or lighter liquid fuels.
  - The liquid (light) category includes fossil liquids (No. 1, 2, 3 fuel oil, jet fuel, bioliquids) either alone or in combination with gaseous fuels.
  - The gas category includes all units that fire any gas or combination of gaseous fuels.

In order to determine which category a unit was assigned to, fuel data was collected from various parts of the combustion survey results. The list below provides the hierarchy for assigning the fuel category assignment:

- Fuels combusted during reported emission tests (if unit fired more than one combination of fuels during multiple emission tests, the unit was assigned to a fuel category based on the fuel hierarchy listed above.
- If the unit did not report any emission data, the fuels category was assigned based on the fuel listed as the *routinely* combusted fuel or combinations of fuels each unit listed in the Data: Materials Combusted table.
- If a unit did not have any routinely listed fuels, the unit was assigned to a fuel category based on the listed start-up fuels. If a unit was not located in the Data: Materials Combusted table, and thus did not have any fuel types associated with it, the unit was assigned to one of the categories based on the fuel associated with its design capacity in the Data: Unit Design/Operations table.
- All small gas units answering Part II.A of the survey were assigned to the gas fuel category.
- If it was unclear which fuel type was associated with the design capacity, the unit was assigned to an “unknown” fuel category.

**Table 2: Major Source Boilers and Process Heater Subcategories**

| Fuel and Combustor Type          | Number of Units |
|----------------------------------|-----------------|
| <b>Biomass (dry):</b> Dutch Oven | 5               |
| FB                               | 11              |
| Fuel Cell                        | 6               |
| Other/Unknown                    | 78              |
| Stoker                           | 115             |
| SuspensionBurner                 | 18              |
| Cyclone                          | 1               |
| <b>Biomass (wet):</b> FB         | 5               |
| Fuel Cell                        | 10              |
| Other/Unknown                    | 38              |
| Stoker                           | 147             |
| SuspensionBurner                 | 3               |

|   |      |
|---|------|
| Dutch Oven  | 1    |
| <b>Coal:</b> Cyclone  | 13   |
| FB  | 35   |
| Other/Unknown   | 15   |
| PC  | 209  |
| Stoker  | 354  |
| <b>Gas:</b> Boiler  | 6151 |
| Process Heater  | 4756 |
| <b>Liquid (heavy):</b> Boiler   | 320  |
| Process Heater  | 53   |
| <b>Liquid (light):</b> Boiler   | 722  |
| Process Heater  | 36   |
| <b>NF Solid:</b> Other/Unknown<br>(Nitrile Pitch Residue, TDF and Paper Residues) | 5    |

\*Other/Unknown indicates that the combustor type was not classified for the unit or the type was listed as something more specific than the categories EPA is presenting in this test plan.

## 2.2 Stratification of CISWI Universe

Subcategories of CISWI units are not being proposed at this time. Factors influencing this decision include the small number of CISWI units relative to boilers and the unique nature of the composition of the materials combusted in each CISWI unit. From what EPA has learned so far about the CISWI population, the percent composition of the materials entering the unit can vary by facility and, in many cases, the material being combusted is unique to that particular facility. Therefore, at this time it is not possible to develop meaningful subcategories that would help to characterize a significant portion of the CISWI population. On the contrary, stratification of the population into distinct subsets of units would likely result in not adequately characterizing emissions from certain units within the entire CISWI population. With additional information, we may be able to identify potential subcategories of CISWI units. As a result, we are requiring emission test information from every facility within the population, with a couple of exceptions: (1) we are only requiring testing of one unit at a facility in cases where multiple identical units with identical controls burn identical materials at the facility; and (2) units that operate for a small number of hours per year and with a small combustion capacity were removed from the test list (but not the CISWI inventory) because EPA projects that these units would not be able to test based on the small scale of the units (and lack of appropriate size stacks that could be tested without significant modification). Such units are still projected to be subject to the standards when completed. Finally, we are only requiring testing for the CAA section 129 pollutants that we do not already have test information on from each unit. The nine pollutants listed by section 129 are: Dioxins/furans (D/F), cadmium (Cd), mercury (Hg), lead (Pb), particulate matter (PM), hydrogen chloride (HCl), carbon monoxide (CO), oxides of nitrogen (NO<sub>x</sub>), and sulfur dioxide (SO<sub>2</sub>).

## 3. Sample Size

One of the most important factors in sample design is that of determining how large a sample is needed for each subcategory to be statistically reliable enough to meet the objectives of the study.

### 3.1 Sample Size for Major Source Boiler and Process Heaters Test Plan

Under section 112, the Agency is required to have enough HAP data to establish MACT floor numerical emission limits for each proposed subcategory. Further, the Agency should consider variability among the units determined to be in the top 12 percent of units (regardless of add-on control technology) in order to establish a MACT floor limit that is achievable over a range of operating conditions.

In the vacated Boiler MACT, the Agency established the following MACT floor limits for existing units:

- o Particulate matter (PM) or total selected metals (TSM), HCl and Hg at existing large solid fuel units.
- o PM or TSM limits for existing limited use solid fuel units

Based on a lack of available emission test data, the vacated Boiler MACT did not establish MACT floor limits for:

- o CO in any existing unit subcategory
- o HCl and Hg at existing limited use solid fuel units
- o PM, TSM, HCl, and Hg in any existing liquid or gaseous subcategories

The Agency plans to use the boilers and process heater test plan to fill data gaps for the regulated pollutants and surrogates across a wide range of fuel types and combustor designs. Further, comments received on the original combustion survey ICR, the original test plan, and during the March 18, 2009 stakeholder meeting have indicated that some testing should be required to identify whether or not CO is an appropriate surrogate for organic HAP emissions regulated under section 112. Based on a review of available emission test data for each potential subcategory, the Agency has established a plan for testing units to complete any data gaps that exist at various combinations of fuel type and combustor design. This test plan combines:

- o One-time stack tests to address gaps for Hg, HCl, CO, Hydrocarbon (HC), formaldehyde, metallic HAP, SO<sub>2</sub>, NO<sub>x</sub>, and PM data;
- o 10-sample fuel analysis for chlorine and mercury content to evaluate variability of these constituents over the 120 testing period;
- o For gas-fired units and a portion of coal-fired units where CO and organic HAP are the only data gaps, one-time stack tests for CO, formaldehyde, HC, and NO<sub>x</sub>;
- o 1-month variability monitoring for CO emissions (using CO CEMS) for 2 coal units, 2 biomass units, 2 liquid fuel units, and 2 gaseous fuel units that are among the best performing units in each of these fuel subcategories along with a 1-month THC monitoring; and

- o For units combusting tire derived fuel and industrial sludges, the Agency is also requesting that these units conduct a stack test for dioxin/furan.

Table 3 summarizes the testing needs and Appendix A details the facility-specific testing, monitoring, and fuel analysis requirements and associated costs.

### 3.2 Sample Size for CISWI Test Plan

As discussed above, we are requiring emission test information from each CISWI facility within the population, with limited exceptions. We are only requiring testing for those CAA section 129 pollutants that we do not have information on already. For several CISWI units, EPA has received emission test data through prior survey responses or compliance data from states or EPA regional offices on one or several of the nine section 129 pollutants in recent years. This information has been incorporated into our emissions database for the CISWI population.

Based on the data gaps in emissions data for each unit, we will generate facility-specific test plans. For example, if we already have emissions test data for CO, HCl, PM, and SO<sub>2</sub> for a CISWI unit, then the test plan for that unit will call for testing of D/F, Cd, Hg, Pb, and NO<sub>x</sub>. This approach will help minimize the cost to facilities to perform the emissions testing, and will prevent duplicative testing requirements.

If a facility operates multiple CISWI units combusting identical materials and using identical control devices, then only one of their CISWI units are listed on the emission test plan. Here again, this will characterize emissions from the waste/control combination at the facility without requiring duplicative emission testing.

Appendix 2 details the facility-specific testing requirements and associated testing costs for each affected CISWI facility.

## 4. Respondent Sample Collection

When selecting sites for testing, the Agency has made efforts to limit testing requirements on small entities. In some cases, small entities were the only types of units available to fill data gaps. The current boiler test plan selected 23 units at small entities for testing, out of the 189 units selected for testing. The current CISWI test plan selected 14 units at small entities for testing, out of the 128 units selected for testing.

On December 18, 2008, the Agency submitted a preliminary list of candidate testing sites to stakeholders for review and comment. On March 18, 2009 these stakeholders met to discuss the test plan and provide further comment on the need for more focus on stack testing and less focus on monitoring data. These comments also directed the Agency to conduct tests at a wider variety of combustor designs. Upon delivery of the section 114 testing letters, the Agency expects individual facilities to indicate whether or not site-specific testing is feasible at their unit based on a limited amount of test waiver criteria including:

- Unit is shutdown during the testing timeframe due to seasonal operations or economic conditions
- Unit vents to a common stack with other combustion units
- Unit does not have accessible testing ports to conduct the test

For the boiler test program, if a unit selected cannot conduct the test as a result of meeting one of these criteria, the Agency will issue a letter to another unit in the same subcategory. Additionally, if a facility can submit existing emission test data that would fill the data gap, that facility will be permitted to submit the existing data instead of conducting a new stack test.

#### 4.1 Respondent Sample Collection for Major Source Boiler and Process Heaters

The Agency must have sufficient data to establish MACT floors for each proposed subcategory. Section 112(d) states that the MACT floor for most categories shall be based on:

- The “average emission limitation achieved by the best performing 12 per cent of existing sources (for which the Administrator has emissions information)”
- For small subcategories (less than 30 sources) it shall be based on “the average emission achieved by the best performing 5 sources (for which the Administrator has or could reasonably obtain emissions information)”.

To address gaps in Hg, HCl, CO, metallic HAP and PM data; the Agency reviewed available emission data within each of the potential fuel and combustor design subcategories. If a unit was selected to complete a data gap for one pollutant, the Agency is requesting that the unit test for all pollutants during that stack test in order to provide more robust data for the boiler rulemaking.

Within each combination of fuel and combustor design, the Agency selected units with the most efficient air pollution control technologies installed in order to obtain data on units that were expected to be within the best performing in each potential subcategory. Additionally, the Agency selected units within each category that were listed as firing combinations of fuels, in order to assess how fuel combinations may affect emissions.

#### 4.2 Respondent Sample Collection for CISWI Units

As discussed above, all CISWI facilities will be covered by this request (with limited exceptions as discussed earlier), unless EPA already has a complete emissions test data set for the CISWI units at a facility. The test data required will consist of a facility-specific list of one to nine of the section 129 pollutants being emitted from the CISWI unit, depending on the data gaps in emissions data for the facility, and pertinent unit operating information during the test. The unit operating information shall consist of combusted material composition and description, charge rate, process/combustor description, control device description, and control device operating parameters.

## 5. Response Rates

Because the information will be requested pursuant to the authority of section 114 of the Act, EPA anticipates that all respondents requested to submit information will do so.

### **List of Appendices**

Appendix 1: Major Source Boiler and Process Heater Test List and Contracting Costs

Appendix 2: CISWI Test List and Contracting Costs