KEY (for internal Agency use only)
▶ = Permitting/Corrective Action
▶ = Engineering
▶ = Chemistry
▶ = Financial Assurance
▶ = Geology

Hazardous Waste "Part B" Operating Permit Application
BIF Module

The following link to guidance is for informational purposes only. Please do not include guidance with the permit application submittal.

Resource Conservation and Recovery Act (RCRA) Training Module about Boilers and Industrial Furnaces | US EPA

Add the permit application module information below where designated in the base checklist (sequentially).

C. ▶ **WASTE CHARACTERISTICS**

C-1h ▶ Waste in Boilers and Industrial Furnaces: 40 CFR 266.102(b), 270.66(c)

Provide for each waste feed stream, including hazardous waste, other fuels, and industrial furnace feed stocks, as fired: (1) heating value; (2) levels of antimony, arsenic, barium, beryllium, cadmium, chromium, lead, mercury, silver, thallium, total chlorine/chloride, and ash; and (3) viscosity or description of the physical form of the feed stream.

Provide for each hazardous waste, as fired: (1) identification of Appendix VIII constituents that would reasonably be expected in the feed; (2) approximate quantification of the hazardous constituents identified; and (3) if blending is to occur prior to firing. A detailed analysis of the hazardous waste prior to blending, the blending material, blending ratios, and description of blending procedures.

C-2g ▶ Additional Requirements Pertaining to Boiler and Industrial Furnace Facilities: 40 CFR 266.102(e)(6)(ii)(C), 266.102(e)(6)(iii)

Feed rate limits of metals, total chlorine and chloride, and ash are established and monitored by knowing the constituent concentrations (i.e., metals, chlorine/chloride, and ash) in each feed stream and the flow rate of each feed stream. The owner/operator must submit a methodology for determining all feed rates for which limits must be established. At a minimum, the methodology must describe: (1) sampling and analysis methods and frequencies for each constituent, and (2) procedures for determining mass flow rates for individual constituents from the raw analytical data.

D. ► PROCESS INFORMATION

D-9 Boilers and Industrial Furnaces (BIFs)

D-9a Waivers/Exemptions: 40 CFR 270.22(a)(2)(i), 266.104(a)(4), 266.110

If applying for a waiver or exemption, provide information demonstrating compliance with the requirements outlined below:

D-9a(1) Waiver of DRE Trial Burn for Boilers: 40 CFR 270.22(a)(2)(i), 266.104(a)(4), 266.110

A boiler that is not burning hazardous waste containing F020, F021, F022, F023, F026, and F027 and submits documentation that it operates under the following conditions is considered in compliance with 266.104(a) DRE Standard, and a DRE trial burn is waived:

- A minimum of 50% fuel fired to the boiler is fossil fuel, fuels derived from fossil fuels, tall oil, or other non-hazardous fuel with fossil fuel characteristics (with the IDEM's approval), with the firing rate determined on a total heat or mass input basis, whichever results in the greater mass feed rate of primary fuel fired.
- Boiler load is not less than 40%.
- Primary and hazardous waste fuels have a minimum as-fired heating value of 8,000 BTU/lb.
- The device operates in conformance with the carbon-monoxide standard of 266.104(b)(1).
- The boiler is a nonstoker watertube boiler.
- The hazardous waste is fired directly into the primary fuel flame zone under the conditions specified in 266.110(f).

D-9a(2) Low Risk Waste Exemption: 40 CFR 270.22(a)(2)(ii), 266.104(a)(5), 266.109(a)

The DRE Standard for a BIF may be waived provided the following information is documented and submitted:

- A minimum of 50% of the fuel fired to the device is fossil fuel, fuels derived from fossil fuels, tall oil, or other non-hazardous fuel with fossil fuel characteristics (with the IDEM's approval), with the firing rate determined on total heat or mass input basis, whichever results in the greater mass feed rate of primary fuel fired.
- Primary and hazardous waste fuels have a minimum of 8,000 BTU/lb as fired heating value.
- The hazardous waste is fired directly into the fuel flame zone.
- The device operates in accordance with carbon monoxide controls provided by 40 CFR 266.104(b)(1).
- Hazardous waste burning will not pose unacceptable, adverse public health effects, as demonstrated in accordance with 40 CFR 266.109(a)(2).
  - › For each waste to be burned, identify and quantify concentrations of Appendix VIII non-metal constituents, except for those that would not reasonably be expected to be in the waste, explaining the basis for excluding any such non-metals.
  - › Hazardous waste firing rate of each constituent identified above.
  - › Calculations of reasonable worst-case emission rates of each constituent identified above based on 99.9% DRE.

- Results of emissions dispersion modeling for each Appendix VIII constituent identified above for all stacks (if multiple stacks).
- Documentation that the maximum annual average ground level concentration of each constituent identified above does not exceed the allowable level established in Appendices IV or V of Part 266 (carcinogens must be summed).

D-9a(3) Waiver of Particulate Matter Standard: 40 CFR 266.109(b), 270.22(a)(4)

The particulate matter standard of 266.105 and trial burn for particulate matter may be waived if:

- The BIF complies with Tier I or Adjusted Tier I metals feed rate screening limits under 40 CFR 266.106(b) or (e) and submits documentation showing conformance with the trial burn waiver under checklist Section D-9a(4) below.
- The BIF meets the requirements of the low-risk waste exemption under checklist Section D-9a(2) above.

D-9a(4) Waiver of Trial Burn for Metals: 40 CFR 266.106(b), 266.106(e), 270.22(a)(3)

A trial burn is not required to demonstrate conformance with the metals standards if the BIF is operated under Tier I or adjusted Tier I metals feed rate screening limits and the following documentation is submitted:

- Feed rate of hazardous waste, other fuels, and industrial furnace feed stocks.
- Concentrations of each of the 10 toxic metals in the hazardous waste, other fuels, and industrial furnace feed stocks.
- Calculation of the total feed rate of each metal.
- Documentation showing how the applicant will ensure the Tier I or Adjusted Tier I feed rate screening limits will not be exceeded during the averaging period under 266.106(b) or (e). (See also checklist Sections C-1h and C-2g.)
- Determination of the following:
  - Terrain-adjusted effective stack height.
  - Good engineering practice stack height.
  - Terrain type.
  - Land use.
- Compliance with 40 CFR 266.106(b)(6) for facilities with multiple stacks.
- Documentation that the facility does not fail the criteria provided by 40 CFR 266.106(b)(7) for eligibility to comply with the screening limits.
- Proposed sampling and metals analysis plan for the hazardous waste, other fuels, and industrial furnace feed stocks.

D-9a(5) Waiver of Trial Burn for HCl/Cl_2: 40 CFR 266.107(b), 266.107(e), 270.22(a)(5)

A BIF is not required to conduct a trial burn to demonstrate conformance with the HCl/Cl_2 standards if the BIF is operated under Tier I or adjusted Tier I feed rate screening limits for HCl/Cl_2 and the following documentation is submitted:

- Feed rate of hazardous waste, other fuels, and industrial furnace feed stocks.
- Levels of total chloride/chlorine in the feeds and the calculation of total feed rate of total chloride/chlorine.
- Documentation showing how the applicant will ensure the Tier I or Adjusted Tier I feed rate screening limits will not be exceeded during the averaging period under 266.107(b)(1) or (e). (See also checklist Sections C-1h and C-2g).
- Determination of the following:
  - › Terrain-adjusted effective stack height.
  - › Good engineering practice stack height.
  - › Terrain type.
  - › Land use.
- Compliance with 266.107(b)(4) for facilities with multiple stacks.
- Determination that the facility does not fail eligibility criteria under 266.107(b)(3) to comply with screening limits.
- Proposed sampling and analysis plan for total chloride and chlorine for the hazardous waste, other fuels, and industrial furnace feed stocks.

D-9b Pretrial Burn Requirements for New BIFs: 40 CFR 270.66(b)(1), 266.102(d)(4)(i), 266.102(e)

Time required to bring the new boiler or industrial furnace to a point of operational readiness for the trial burn must be the minimum necessary and cannot exceed 720 hours, or up to 1,440 hours if the applicant shows good cause for requiring an extension. The permit application must include:

- A proposed start-up schedule for the BIF.
- A description of the system that will be used to monitor operating hours during the pretrial burn period.

A statement must be submitted that stipulates the conditions necessary to operate in compliance with 266.104 through 266.107 standards and, at a minimum, includes applicable operating restrictions in 266.102(e).

Note: If the applicant is seeking a waiver from a trial burn to demonstrate conformance with a particular emission standard, the operating requirements during this initial period of operating shall include those specified by the applicable provision of 40 CFR 266.104 through 266.107. See checklist Section D-9a.

D-9b(1) Pretrial Burn Requirements for New BIFs - Organic Emission Standards: 40 CFR 266.102(e)(2), 266.104(d), 266.104(e), 270.66(b)(1)(i)

For conformance with organic emissions standards in 40 CFR 266.104, the description of operating conditions must specify the following restrictions:

- Composition of hazardous waste, including acceptable physical/chemical variations.
- Feed rate of hazardous waste and other fuels measured per 40 CFR 266.102(e)(6).
- Minimum device production rate when producing normal product measured per 40 CFR 266.102(e)(6).
- Maximum device production rate when producing normal product measured per 40 CFR 266.102(e)(6).

- Appropriate controls of the hazardous waste firing system.
- Allowable variation in boiler or industrial furnace system design or operating procedures. (Permit writer to specify in permit.).
- Minimum combustion gas temperature measured at a location indicative of combustion chamber temperature per 40 CFR 266.102(e)(6).
- Appropriate indicator of combustion gas velocity measured 40 CFR 266.102(e)(6).
- Such other operating requirements as are necessary to ensure that the DRE performance standard of 40 CFR 266.104(a) is met.
- Appropriate CO/HC limit(s) as follows:
  - CO≤ 100 ppm when complying with 40 CFR 266.104(b)(1).
  - CO limit based on test burn and HC ≤ 20 ppm when complying with 266.104(c).
  - CO and HC limits from baseline HC test for furnaces with organic matter in raw material when complying with 40 CFR 266.104(f).
  - For furnaces feeding ingredients at locations other than the hot end, the 20 ppm HC limit or baseline limit as described above applies irrespective of whether CO is ≤ 100 ppm.
- Hazardous waste will not be fed to the device during startup/shutdown unless it is fed as an ingredient under Tier I/Adjusted Tier I standards or as a low-risk waste.
- For boilers and industrial furnaces equipped with dry PM control devices that operate within the 450-750°F temperature range and industrial furnaces operating under the alternative HC limit, the description of operating conditions must include an evaluation of the site specific risks from emissions of dioxins and furans and demonstrate that the increased cancer risk to the hypothetical maximum exposed individual would not exceed 1 in 100,000.

D-9b(2) Pretrial Burn Requirements for New BIFs - PM Emissions Standards: 40 CFR 266.105, 270.66(b)(1)(i)

For conformance with the PM emissions standard in 40 CFR 266.105, the description of operating conditions must specify the following restrictions:

- Total ash feed rate from hazardous waste, other fuels, and industrial furnace feed stocks [except for cement kilns and lightweight aggregate kilns] measured per 40 CFR 266.102(e)(6).
- Maximum device production rate when producing normal product measured per 40 CFR 266.102(e)(6).
- Appropriate controls on hazardous waste firing system and air pollution control system.
- Allowable variation in boiler or industrial furnace system design or operating procedures. (Permit writer to specify in permit).
- Such other operating requirements that are necessary to ensure that the particulate standard in 40 CFR 266.105 is met.

D-9b(3) Pretrial Burn Requirements for New BIFs -Metals Emissions Standards: 40 CFR 266.102(e)(4)(i) and (ii), 266.106, 270.66(b)(1)(i)

For conformance with the metals emissions standards in 40 CFR 266.106, the operating requirements must specify the applicable restrictions listed below. The facility must also demonstrate that planned feed rate or emission limits are within maximum allowable emission/feed rates. This demonstration must include a

complete description of the determination of the maximum allowable emission/feed rate for each metal.

- Tier 1 or Adjusted Tier 1:
  - Total feed rate of each metal in hazardous waste, other fuels, and industrial furnace feed stocks measured per 266.102(e)(6).
  - Total feed rate of hazardous waste measured per 266.102(e)(6).
  - Metals sampling and analysis program for hazardous waste, other fuels, and industrial furnace feedstocks.
- Tier II or Tier III:
  - Maximum emission rate for each metal.
  - Feed rate of total hazardous waste and pumpable hazardous waste measured per 266.102(e)(6).
  - Feed rate of each metal in each of the following feed streams measured per 266.102(e)(6):
    - Total feed streams.
    - Total hazardous waste feed.
    - Total pumpable hazardous waste feed.
  - Total feed rate of chlorine and chloride in total feed streams measured per 266.102(e)(6).
  - Maximum combustion gas temperature measured per 266.102(e)(6).
  - Maximum flue gas temperature at the inlet to the PM air pollution control system measured per 266.102(e)(6).
  - Maximum device production rate when producing normal product measured per 266.102(e)(6).
- Appropriate controls on operation and maintenance of the hazardous waste firing system and air pollution control system (APCS).
- Allowable variation in boiler or industrial furnace system design or operating procedures. (Permit writer to specify in permit.)
- Such other operating requirements that are necessary to ensure that the metals standards under 266.106(c) or (d) are met:
  - Wet scrubbers/wet ionizing scrubbers:
    - Minimum liquid to flue gas ratio.
    - Minimum scrubber blowdown or maximum suspended solids content of scrubber water.
    - Minimum pH of scrubber water.
  - Venturi scrubbers:
    - Minimum differential gas pressure across the venturi.
  - Dry scrubbers:
    - Minimum alkali feed rate.
    - Maximum flue gas flow rate.
  - Wet ionizing scrubbers/electrostatic precipitators:
    - Minimum electrical power (kVA).
    - Maximum flue gas flow rate.
  - Baghouses:
    - Minimum pressure drop.

D-9b(4) <u>Pretrial Burn Requirements for New BIFs - Alternative Metals Approach</u>: 40 CFR 266.102(e)(4)(iii), 266.106(f)

For conformance with the alternative metals approach, the description of operating conditions must:

- Describe the approach that will be used to comply.
- Specify how the approach ensures compliance with the metals emissions standards of 40 CFR 266.106(c) or (d).
- Specify how the approach can be effectively implemented and monitored.
- Provide such other information as necessary to ensure that the standards of 40 CFR 266.106(c) or (d) are met.

D-9b(5) Pretrial Burn Requirements for New BIFs - Hydrogen Chloride/Chlorine Emissions Standards: 40 CFR 266.102(e)(5)(i), 266.107, 270.66(b)(1)(i)

For conformance with hydrogen chloride/chlorine emissions standards in 266.107, the description of operating conditions must specify the following applicable restrictions:

- Tier I or Adjusted Tier I:
  - › Feed rate of total chlorine/chloride in hazardous waste, other fuels, and industrial furnace feedstocks measured per 266.102(e)(6).
  - › Feed rate of total hazardous waste measured per 266.102(e)(6).
  - › Sampling and analysis program for total chlorine/chloride for hazardous waste, other fuels, and industrial furnace feedstocks.
- Tier II and Tier III:
  - › Maximum emission rates of HCL and $C1_2$.
  - › Feed rate of total hazardous waste measured per 266.102(e)(6).
  - › Total feed rate of chlorine and chloride in total feed streams measured per 266.102(e)(6).
  - › Maximum device production rate when producing normal product measured per 266.102(e)(6).
  - › Appropriate controls on operation and maintenance of hazardous waste firing system and APCS.
  - › Allowable variation in boiler or industrial furnace system design or operating procedures. (Permit writer to specify in permit).
  - › Such other operating requirements as are necessary to ensure that the HCL and $C1_2$ standards under 266.107(b)(2) or (c) are met.

D-9b(6) Pretrial Burn Requirements for New BIFs - Fugitive Emissions:
40 CFR 266.102(e)(7)(i), 270.66(b)(1)(i)

The description of operating conditions must thoroughly describe the method by which fugitive emissions will be controlled. Fugitive emissions must be controlled by:

- Totally sealing the combustion zone,
- Maintaining negative pressure in the combustion zone, or
- An alternative method demonstrated to provide control equivalent to maintenance of combustion zone pressure lower than atmospheric pressure.

D-9b(7) Pretrial Burn Requirements for New BIFs - Automatic Waste Feed Cutoff
40 CFR 266.102(e)(7)(ii) and (iii), 270.66(b)(1)(i)

The description of operating conditions must specify that the automatic waste feed cut-off will operate as follows:

- Hazardous waste feed will be automatically cut-off when operating parameters deviate from those specified above for pretrial burn period. At a minimum, the automatic waste feed cut-off will be tied to all parameters listed under monitoring requirements in checklist Section D-9i.
- Minimum combustion chamber temperature will be maintained while hazardous waste or its residues remain in the combustion chamber. A description of procedures and controls used to maintain the minimum combustion chamber temperature must be included.
- Exhaust gases will be ducted to the APCS while hazardous waste or its residues remain in the combustion chamber. A description should be provided with the engineering description. See checklist Section D-9c.
- Operating parameters will be monitored during the cut-off and hazardous waste feed will not be restarted until the parameters are within allowable limits. For parameters that may be measured on an instantaneous basis, the description of operating conditions should propose a period of time after waste feed cutoff during which a parameter must not exceed the permit limit before hazardous waste feed may be restarted. The proposed period of time will be subject to the IDEM's approval.
- The description of operating conditions must specify that the BIF will stop burning hazardous waste when changes in combustion properties or feed rates of hazardous waste, other fuels, or industrial furnace feedstocks, or changes in BIF design or operating conditions deviate from those specified above for the pretrial burn period.

D-9b(8) ▶ Pretrial Burn Requirements for New BIFs - Monitoring Requirements
40 CFR 266.102(e)(8), 266.102(e)(10), 270.66(b)(1)(i)

The description of operating conditions must specify that the following will be monitored and recorded when burning hazardous waste:

- All parameters listed under monitoring requirements in checklist Section D-9i.
- Sampling and analysis of hazardous waste (and other fuels and feedstocks), residues, and exhaust emissions will be conducted as necessary to verify that the operating requirements achieve the applicable standards of 40 CFR 266.104 through 266.107.
- The BIF will be subject to thorough visual inspections when it contains hazardous waste (at least daily) for signs of leaks, spills, fugitive emissions, and tampering.
- Automatic waste feed cut-off system will be tested at least once every 7 days when hazardous waste is burned unless the applicant demonstrates that weekly inspections unduly upset operations. At a minimum, testing must be conducted once every 30 days. A description of automatic feed cut-off system testing procedures should be included.
- The description of operating conditions must specify that operating records will be maintained until closure of the facility.

D-9c ▶ Trial Burn Plan Requirements for all BIFs

40 CFR 266.102(d)(4)(ii), 270.66(b)(2) and (c) and (e)

For the duration of the trial burn, the operating conditions must be sufficient to demonstrate compliance with the performance standards of 40 CFR 266.104 through 266.107.

The trial burn plan must include the following information:

- An analysis of each feed stream, including hazardous waste, other fuels, and industrial furnace feed stocks, as fired, which includes:
  - Heating value.
  - Levels of antimony, arsenic, barium, beryllium, cadmium, chromium, lead, mercury, silver, thallium, total chlorine/chloride, and ash.
  - Viscosity or description of the feed stream's physical form.
- An analysis of each hazardous waste, as-fired:
  - Identification of Appendix VIII constituents that would reasonably be expected in the feed. (Note: the applicant need not analyze for Appendix VIII constituents that would reasonably not be expected to be found in the waste. The constituents excluded from analysis must be identified, and the basis for exclusion stated.)
  - Approximate quantification of the hazardous constituents identified.
  - If blending is to occur prior to the firing:
    - Detailed analysis of the hazardous waste prior to blending and of the material with which it is blended.
    - Blending ratios.
    - Description of blending procedures.
- Detailed engineering description of the boiler and industrial furnace, including:
  - Manufacturer's name and model number.
  - Type of boiler or industrial furnace.
  - Maximum design capacity in appropriate units.
  - Description of the feed system for the hazardous waste and other fuels, and industrial furnace feed stocks.
  - Capacity of hazardous waste feed system.
  - Description of automatic waste feed cutoff system(s).
  - Description of any air pollution control system.
  - Description of stack gas monitoring and pollution control monitoring systems.
- A detailed description of sampling and monitoring procedures including:
  - Sampling and monitoring equipment.
  - Sampling and monitoring frequency.
  - Sampling and analytical procedures.
  - Sampling and monitoring locations.
  - Quality assurance/quality control program.
- Test schedule for each hazardous waste:
  - Dates when trial burn is planned.
  - The duration of each trial burn.
  - The quantity of waste to be burned during each trial burn.
  - Other relevant factors.
- Test protocols for each hazardous waste including the following for each waste to be burned:
  - Ranges of hazardous waste feed rate.

- › Feed rates of other fuels and industrial furnace feedstocks.
- Other parameters that may affect the ability of the BIF to meet:
  - › Organic emission standards.
  - › Metals emission standards.
  - › PM emission standards.
  - › HCL/Cl_2 emissions standards.
- A description of planned operating conditions for any APCS equipment that will be used.
- Procedures for stopping the hazardous waste feed and controlling emissions in the event of equipment malfunctions.
- When a DRE trial burn is required under 40 CFR 266.104(a), the description of operating conditions should propose principal organic hazardous constituents (POHCs) for which DRE will be calculated during the trial burn. The basis for selecting the POHCs should be described. The proposed POHCs will be subject to the IDEM's approval.
- Other information as IDEM finds necessary.

D-9d ▶ Trial Burn Results: 40 CFR 270.66(d), 270.66(f), 270.22(a)(6)

The following must be submitted within 90 days of the completion of the trial burn. The submittal must be certified on behalf of the applicant by the signature of a person authorized to sign a permit application or a report under 40 CFR 270.11.

- A statement that the trial burn has been conducted in accordance with the approved trial burn plan.
- All data collected during any trial burn must be submitted following completion of the trial burn.
- A quantitative analysis of the levels of antimony, arsenic, barium, beryllium, cadmium, chromium, lead, mercury, thallium, silver, and chlorine/chloride, in the feed streams (hazardous waste, other fuels, and industrial furnace feedstocks).
- If a DRE trial burn was required under 40 CFR 266.104(a):
  - › A quantitative analysis of the trial POHCs in the hazardous waste feed.
  - › A quantitative analysis of the stack gas for the concentration and mass emissions of the trial POHCs.
  - › A computation of destruction and removal efficiency (DRE) in accordance with the DRE formula specified in 40 CFR 266.104(a).
- If a trial burn for chlorinated dioxins and furans was required under 40 CFR 266.104(e):
  - › A quantitative analysis of the stack gas for the concentration and mass emission rate of the 2, 3,7,8-chlorinated tetra-octa congeners of chlorinated dibenzo-p-dioxins and furans.
  - A computation showing conformance with the emission standard.
- If a trial burn for particulate matter, metals, or HCL/Cl_2 was required under 40 CFR 266.105, 266.106(c) or (d), or 266.107(b)(2) or (c):
  - › A quantitative analysis of the stack gas for the concentrations and mass emissions of particulate matter, metals, or hydrogen chloride (HCl) and chlorine (Cl_2).
  - › Computations showing conformance with the applicable emissions performance standards.
- If a trial burn for DRE, metals, or HCL/Cl_2 was required under 266.104(a), 266.106(c) or (d), or 266.107(b)(2) or (c), a quantitative analysis of the

scrubber water (if any), ash residues, other residues, and products for the purpose of estimating the fate of the trial POHCs, metals, and chlorine/chloride.
- An identification of sources of fugitive emissions and their means of control.
- Records of continuous measurement of carbon monoxide (CO), oxygen, and where required, hydrocarbons (HC) in the stack gas.
- Such other information as necessary to ensure that the trial burn will determine compliance with the performance standards in 40 CFR 266.104 through 266.107.

D-9e Post-Trial Burn Requirements for New BIFs: 40 CFR 270.66(b)(3)(ii), 266.102(d)(4)(iii), 266.102(e)

Post-trial burn requirements for new BIFs are the same as the pretrial burn requirements for new BIFs listed in checklist Section D-9b, with the following exceptions:

- The total length of time during which a facility may burn hazardous waste is not limited after the trial burn. Therefore, no documentation of total burning hours is required.
- For the pretrial burn period, a BIF must submit a statement that suggests the conditions necessary to operate in compliance with the standards of 40 CFR 266.104 through 266.107. For the post-trial burn period, a BIF must submit a statement that, based upon the results of the trial burn, identifies the conditions necessary to operate in compliance with the standards of 40 CFR 266.104 through 266.107.
- For the post trial burn period, a BIF must submit a statement specifying that the BIF will stop burning hazardous waste when changes in combustion properties or feed rates of hazardous waste, other fuels, or industrial furnace feedstocks, or changes in BIF design or operating conditions deviate from those specified above for the post-trial burn period.

D-9f ▶ Data in Lieu of Trial Burn: 40 CFR 270.22(a)(6), 270.66(c)(3)

A BIF may seek an exemption from trial burn requirements by submitting the following information provided by previous compliance testing of the same device, or from compliance testing or trial or operational burns of similar BIFs burning similar hazardous wastes under similar conditions:

- A description and analysis of the hazardous waste to be burned compared with the hazardous waste for which data from compliance testing, operational burns, or trial burn(s) are provided to support the contention that a trial burn is not needed.
- Design and operating conditions of the boiler and or industrial furnace to be used compared with that for which data is available and being submitted.
- A detailed engineering description of the boiler or industrial furnace to be used compared with that for which data is available and being submitted. The following must be described for both BIF units:
  - › Manufacturer's name and model number of the BIF;
  - › Type of boiler or industrial furnace;
  - › Maximum design capacity;

  - › Description of the feed system for the hazardous waste, other fuels, and industrial furnace feedstocks;
  - › Capacity of hazardous waste feed system;
  - › Description of automatic hazardous waste feed cutoff system(s);
  - › Description of APCS; and
  - › Description of stack gas monitoring and air pollution control monitoring systems.
- Such other information necessary to support the contention that a trial burn is not needed.
- All data and results from the previous testing. The data and results submitted must include all of the information listed under Trial Burn Results in checklist Section D-9d.

D-9g Alternative HC Limit for Industrial Furnaces with Organic Matter in Raw Materials 40 CFR 270.22(b), 266.104(f)

Industrial furnaces requesting the alternative HC limit must submit the following information:

- Documentation that the furnace is designed and operated to minimize HC emissions from fuels and raw materials.
- Statement of proposed baseline HC and CO levels.
- Basis for the proposed baseline flue gas HC and CO concentrations, including data on HC and CO levels during tests when the facility produced normal products under normal operating conditions from normal raw materials while burning normal fuels and when not burning hazardous waste.
- Test burn protocol to confirm baseline HC and CO levels, including information on type and flow rate of all feed streams, point of introduction of feed streams, total organic carbon content (or other appropriate measure of organic content) of all nonfuel feed streams and operating conditions that affect combustion of fuel(s) and hydrocarbon emissions from nonfuel sources.
- Trial burn plan to:
  - › Demonstrate that flue gas HC and CO concentrations when burning hazardous waste do not exceed baseline levels.
  - › Identify types and concentrations of organic compounds listed in Part 261 Appendix VIII that are emitted when burning hazardous waste.
- Implementation plan to monitor over time changes in operation that could reduce the baseline HC levels.
- Procedures to periodically confirm baseline levels.
- Such other information as necessary to ensure that the requirements of 266.104(f) are met.

D-9h Alternative Metals Implementation Approach: 40 CFR 270.22(c), 266.106(f)

For conformance with an alternative metals implementation approach, the information must:

- Describe the approach that will be used to comply.
- Specify how the approach ensures compliance with the metals emissions standards of 40 CFR 266.106(c) or (d).
- Specify how the approach can be effectively implemented and monitored.

- Provide such other information as necessary to ensure that the standards of 40 CFR 266.106(c) or (d) are met.

D-9i Monitoring Requirements: 40 CFR 266.102(e)(6), 266.102(e)(8)

The following must be monitored on a continuous basis per 266.102(e)(6) while burning hazardous waste. Feed rates for metals, total chlorine and chloride, and ash are continuously monitored by knowing the concentration of the constituent (through periodic waste analyses) in each feed stream and continuously monitoring the flow rate of each feed stream. Data must be maintained in the operating record until closure of the facility.

- For conformance with the organic emission standards in 40 CFR 266.104:
  - Feed rate of hazardous waste and other fuels.
  - Device production rate.
  - Combustion gas temperature.
  - Appropriate indicator of combustion gas velocity.
  - Carbon monoxide and oxygen.
  - Total hydrocarbons (if complying with 40 CFR 266.104(c), (d) or (f)).
- **or**, if the waiver of DRE trial burn for boilers applies:
  - Carbon monoxide and oxygen.
- **or**, if the low risk waste exemption applies:
  - Carbon monoxide and oxygen.
- For conformance with the particulate emission standard in 266.105, unless the particulate standard is waived under 266.109(b):
  - Total ash feed rate from hazardous waste, other fuels, and industrial furnace feed stocks [except for cement kilns and lightweight aggregate kilns].
  - Device production rate.
- For conformance with the metal emission standards in 266.106:
  - Tier I or adjusted Tier I:
    - Total feed rate of each metal in hazardous waste, other fuels, and industrial furnace feed stocks.
    - Total feed rate of hazardous waste.
  - Tier II or Tier III:
    - Feed rate of total hazardous waste.
    - Feed rate of pumpable hazardous waste.
    - Feed rate of each metal in the following feed streams:
      - Total feed streams.
      - Total hazardous waste feed.
      - Total pumpable hazardous waste feed.
    - Total feed rate of chlorine/chloride in total feed streams.
    - Combustion gas temperature.
    - Flue gas temperature at the inlet to the air pollution control system.
    - Device production rate.
  - Alternative Metals Approach (including the Kiln Dust Monitoring Approach in 266 Appendix IX):
    - (same as Tier II requirements except for feed rate of metals in total feed streams)
- For conformance with HCl/Cl_2 emission standards in 266.107:
  - Tier I or adjusted Tier I:

        - Feed rate of total chlorine/chloride in hazardous waste, other fuels, and industrial furnace feed stocks.
        - Feed rate of total hazardous waste.
    - Tier II or Tier III:
        - Feed rate of total hazardous waste.
        - Total feed rate of chlorine/chloride in total feed streams.
        - Production rate when producing normal product.
- For other operating requirements as may be necessary to ensure that the performance standards of 266.104 through 266.107 are met:
    - Wet scrubbers/wet ionizing scrubbers.
        - Liquid to flue gas ratio.
        - Scrubber blowdown or suspended solids content of scrubber water.
        - pH of scrubber water.
    - Venturi scrubbers.
        - Minimum differential gas pressure.
    - Dry scrubbers.
        - Caustic feed rate.
        - Flue gas flow rate.
    - Wet ionizing scrubbers/electrostatic precipitators.
        - Electrical power (kVA).
        - Flue gas flow rate.
    - Baghouses.
        - Pressure drop.

D-9j Automatic Waste Feed Cut-off System: 40 CFR 270.22(d), 266.102(e)(7), (ii)

All facilities must submit a description of the automatic waste feed cut-off system, including any pre-alarm system that may be used. The description must include:

- A statement that hazardous waste feed will be automatically cut off when operating conditions deviate from those established under 40 CFR 266.102.
- A list of all parameters tied into the automatic waste feed cut-off system. At a minimum, the system must be tied to all parameters listed under monitoring requirements in checklist Section D-9i.
- A description of procedures and controls used to maintain the minimum combustion chamber temperature while hazardous waste residues remain in the combustion chamber.
- A statement that exhaust gases will be ducted to the APCS while hazardous waste or its residues remain in the combustion chamber.
- A statement that operating parameters will be monitored during the cut-off and hazardous waste feed may not be restarted until the parameters are within allowable limits. For parameters that may be measured on an instantaneous basis, the statement should propose a period of time after waste feed cut-off during which a parameter must not exceed the permit limit before hazardous waste feed may be restarted. The proposed period of time will be subject to IDEM’s approval.

D-9k Direct Transfer Standards
40 CFR 266.111, 270.22(e), 40 CFR 264 Subparts I and J

BIFs that directly feed hazardous waste from a transport vehicle to a BIF without the use of a storage unit must submit the following:

A description of direct transfer procedures that will be used.

- A statement and description of procedures to ensure that no direct transfer of a pumpable hazardous waste shall be conducted from an open-top container to a boiler or industrial furnace.
- A statement and description of procedures to ensure that direct transfer equipment used for pumpable hazardous waste shall always be closed, except when necessary to add or remove the waste, and shall not be opened, handled, or stored in a manner that may cause any rupture or leak.
- A description of direct transfer operations, including procedures and controls implemented so that transfer operations do not:
  - › Generate extreme heat or pressure, fire, explosion, or violent reaction.
  - › Produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to threaten human health.
  - › Produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosion.
  - › Damage the structural integrity of the container or direct transfer equipment containing the waste.
    Adversely affect the capability of the BIF to meet the standards provided in 40 CFR 266.104 through 266.107.
  - › Threaten human health and the environment.
- A statement and description of procedures to ensure that hazardous waste shall not be placed in direct transfer equipment if it could cause the equipment or its secondary containment system to rupture, leak, corrode, or otherwise fail.
- A description of controls and practices that will be used to prevent spills and overflows from the direct transfer equipment or its secondary containment systems including at a minimum:
  - › Spill prevention controls (e.g., check valves, dry disconnect couplings).
  - › Automatic waste feed cutoff if a leak or spill occurs from the equipment.

D-9k(1) Direct Transfer Standards - Containment System: 40 CFR 264.175

In areas where direct transfer vehicles are located, a description of the containment system, demonstrating that the containment system is designed and operated as follows (containment system requirements also apply to areas that store containers with F020, F021, F022, F023, F026, or F027 even though the containers may not contain free liquids):

- A base underlies the containers that is free of cracks or gaps and is sufficiently impervious to contain leaks, spills, and accumulated precipitation until the collected material is detected and removed.
- The base is slopped or the containment system is otherwise designed and operated to drain and remove liquids resulting from leaks, spills, or

precipitation, unless the containers are elevated or are otherwise protected from contact with accumulated liquids.

- The containment system has sufficient capacity to contain 10% of the volume of containers or the volume of the largest container, whichever is greater. Containers that do not contain free liquids need not be considered in this determination.
- Run-on into the containment system is prevented unless the collection system has sufficient excess capacity to contain any run-on that might enter the system.
- Spilled or leaked waste and accumulated precipitation is removed from the sump or collection area in as timely a manner as is necessary to prevent overflow of the collection system.
- Except for areas with containers storing F020, F021, F022, F023, F026 and F027, storage areas that store containers holding only wastes that do not contain free liquids need not have a containment system defined above provided that:
  - › The storage area is sloped or is otherwise designed and operated to drain and remove liquid resulting from precipitation.
  - › The containers are elevated or are otherwise protected from contact with accumulated liquid.

D-9k(2) Direct Transfer Standards - Condition of Containers: 40 CFR 264.171

Provide a statement and description of procedures to ensure that if a container holding hazardous waste is not in good condition, or if it begins to leak, the owner or operator will transfer the hazardous waste from this container to a container that is in good condition or manage the waste in some other way that complies with the requirements of this part.

D-9k(3) Direct Transfer Standards - Compatibility of Waste with Container: 40 CFR 264.172

Provide a statement that the owner or operator will use a container made of or lined with materials that will not react with, and are otherwise compatible with, the hazardous waste to be stored, so that the ability of the container to contain the waste is not impaired.

D-9k(4) Direct Transfer Standards - Management of Containers: 40 CFR 264.173

Provide a statement that:

- A container holding hazardous waste will always be closed during storage, except when it is necessary to add or remove waste.
- A container holding hazardous waste will not be opened, handled, or stored in a manner that may rupture the container or cause it to leak.

D-9k(5) Direct Transfer Standards - Special Requirements of Ignitable or Reactive Waste 40 CFR 264.176

Provide documentation of the location of all containers holding ignitable/reactive waste. Containers holding ignitable/reactive waste must be located at least 50 feet from the facility property line or comply with requirements for the maintenance of distances between waste management areas and any public ways, streets, alleys, or adjacent property line that can be built upon as required

in Tables 2-1 through 2-6 of the National Fire Protection Association's "Flammable and Combustible Liquids Codes," (1977 or 1981).

D-9k(6) Direct Transfer Standards - Special Requirements of Incomplete Wastes
40 CFR 264.177

Provide a statement and description of procedures to ensure that:

- Incompatible wastes will not be placed in the same container.
- Hazardous waste will not be placed in an unwashed container that previously held an incompatible waste or material.
- A storage container holding a hazardous waste that is incompatible with any waste or other materials stored nearby in other containers, piles, open tanks, or surface impoundments will be separated from the other materials or protected from them by means of a dike, berm, wall, or other device.

D-9k(7) Direct Transfer Standards - Closure: 40 CFR 264.178

Describe how all hazardous waste and hazardous waste residues will be removed from the containment system at closure. Remaining containers, liners, bases, and soil containing or contaminated with hazardous waste or hazardous waste residues must be decontaminated or removed.

D-9k(8) Direct Transfer Standards - Secondary Containment Requirements
40 CFR 266.111(e)

Owners/operators must submit documentation demonstrating conformance with secondary containment requirements of 40 CFR 265.193(b), (c), and (f) - (h):

- For ~~new~~ direct transfer equipment, prior to their being put into service. ~~and~~
- ~~For existing direct transfer equipment, by August 21, 1993.~~
- ~~Prior to meeting secondary containment requirements, existing direct transfer without such containment must be assessed to determine its fitness for use. The owner shall keep on file a written assessment reviewed and certified by a registered professional engineer that attests to the equipment's integrity by August 21, 1992. At a minimum, this assessment should consider:~~
  - ~~Design standards;~~
  - ~~Waste characteristics;~~
  - ~~Existing corrosion protection measures;~~
  - ~~Documented age;~~
  - ~~Results of leak test or other integrity determination.~~
- If leaking or unfit, the requirements of 40 CFR 264.196(a) and (b) must be followed.
- Inspections must be made at least once each hour when hazardous waste is being transferred and records made in accordance with 40 CFR 266.111(e)(3).
- Provide documentation that design and installation of new ancillary equipment meets 40 CFR 264.192.
- Provide documentation that responses to leaks or spills comply with 40 CFR 264.196.

D-9l ▶ Bevill Residues: 40 CFR 266.112, Part 266 Appendices VII and IX, 270.22(f)

Owners/operators claiming residues are excluded from regulation must submit the following applicable information to demonstrate conformance with 40 CFR 266.112:

- Boilers must burn at least 50% coal on a total heat input or mass input basis, whichever results in the greater mass feed rate of coal.
- Ore or Mineral Furnaces: Industrial furnaces subject to 40 CFR 261.4(b)(7) must process at least 50% by weight normal, non-hazardous raw materials.
- Cement kilns must process at least 50% by weight normal cement-production raw materials.
- Either of the following two criteria must be demonstrated to show that the hazardous waste does not significantly affect the residue:

  (1) Comparison of Waste-Derived Residue with Normal Residue: The waste-derived residue does not contain 40 CFR 261 Appendix VIII constituents (toxic constituents) that could reasonably be attributable to the hazardous waste at concentrations significantly higher than in residue generated without burning or processing of hazardous waste. Toxic constituents include Appendix VIII constituents in the waste and those Appendix VIII constituents that may be generated as products of incomplete combustion.

  Concentration of toxic constituents of concern in normal residue shall be determined based on analyses of a minimum of 10 samples representing a minimum of 10 days of operation. Composite samples may be used to develop a sample for analysis provided that the compositing period does not exceed 24 hours. The upper tolerance limit (at 95% confidence with a 95% proportion of the sample distribution) of the concentration in the normal residue shall be considered the statistically-derived concentration in the normal residue. The baseline must be revised if changes in the raw material or fuel occur. The statistical procedures in "Statistical Methodology for Bevill Residue Determinations" in Appendix IX shall be used to determine upper tolerance limit.

  Waste-derived residue shall be sampled and analyzed as often as necessary to determine whether the residue generated during each 24-hour period has concentrations of toxic constituents that are higher than the concentrations established for the normal residues. If so, the residue shall not be excluded from the definition of a hazardous waste. Concentrations of toxic constituents of concern in the waste-derived residue shall be determined based on analysis of one or more samples obtained over a 24-hour period.

  (2) Comparison of Waste-Derived Residue Concentrations with Health-Based Limits:

  The concentration of each nonmetal toxic constituent of concern in the waste-derived residue does not exceed the health-based

levels specified in Appendix VII of 40 CFR 266 or the level of detection (using analytical procedures in SW-846), whichever is higher. If a health-based limit for a constituent of concern is not listed in Appendix VII of this part, then a limit of 0.002 micrograms per kilogram or the level of detection, whichever is higher, shall be used.

The concentration of each metal in an extract obtained using the Toxicity Characteristic Leaching Procedure of 40 CFR 261.24 does not exceed the levels specified in 266 Appendix VII.

Waste-derived residue shall be sampled and analyzed as often as necessary to determine whether the residue generated during each 24-hour period has concentrations of toxic constituents that are higher than the health-based levels. Concentrations of toxic constituents of concern in the waste-derived residue shall be determined based on analysis of one or more samples obtained over a 24-hour period.

- Documentation: Records sufficient to document the following shall be retained until closure of the BIF:
  - Levels of Appendix VIII constituents that are present in the waste-derived residues.
  - If the waste-derived residue is compared with normal residue:
    - Levels of Appendix VIII constituents that are present in normal residues.
    - Data and information obtained to determine if changes in raw material or fuels would reduce the concentrations of toxic constituents of concern in the normal residue.

► **<u>Summary of Emissions Standards</u>**

The following section is a summary of applicable emissions standards. It is provided for the benefit of the permit writer and supplements the checklist sections detailed above. This section does not require completion by the applicant.

1. <u>Carbon Monoxide/Hydrocarbon (CO/HC) Emissions Standards:</u> 40 CFR 266.104, 266.104(b)(1), 266.104(f), 270.22(b)

   CO cannot exceed 100 ppmv (hourly rolling average) over any 60 minute period continuously corrected to 7% oxygen on a dry gas basis; <u>or</u>

   CO may exceed 100 ppmv (and is established based on the trial burn) provided that hydrocarbon emissions do not exceed 20 ppmv reported as propane (hourly rolling average) corrected to 7% oxygen on a dry gas bases; <u>or</u>

   If approved by IDEM on a case-by-case basis, industrial furnaces that cannot meet the 20 ppmv HC standard due to organic matter in the normal raw material (except cement kilns equipped with by-pass ducts described in 266.104(g)) may establish, during the trial burn, an alternative HC limit that ensures that HC emissions when burning hazardous waste are not greater than when not burning hazardous waste,

provided the following is demonstrated when applying for the alternative HC standard:

-The facility is designed and operated to minimize HC emissions from fuels and raw materials;

-Emissions testing must be conducted to determine the baseline HC and CO levels; emissions from hazardous waste burning do not exceed these baselines; identify the types and concentrations of Part 261 Appendix VIII organic constituents that are emitted; and conduct dispersion modeling for emission of Appendix VIII constituents to predict maximum annual average ground level concentrations;

-Test burn protocol to confirm the baseline HC (and CO) level including information on the type and flow rate of all feed streams, point of introduction of all feed streams, total organic carbon content (or other appropriate measure of organic content) of all non fuel feed streams and operating conditions that affect combustion of fuels(s) and destruction of hydrocarbon emissions from non-fuel sources;

-The maximum annual average ground level concentrations cannot exceed those levels established in Appendix IV or V of Part 266 (or 0.1ug/m^3 for compounds not listed in these appendices);

-An approach must be developed to monitor changes over time in operations that could reduce the HC baseline.

2. Cement Kilns and CO/HC Standards: 40 CFR 266.104(g)

   Cement kilns may comply with the CO/HC standards described above by monitoring in the by-pass duct provided that:

   -Hazardous waste is fired only into the kiln;

   -The by-pass duct directs a minimum of 10% of kiln off-gas into the duct.

3. Destruction and Removal Efficiency (DRE) for Organics
   40 CFR 266.104(a)

   DRE for all organic hazardous constituents in the waste feed must meet or exceed 99.99%.

   DRE for all dioxin-listed wastes in the waste feed must meet or exceed 99.9999%.

4. Dioxin/Furan Emissions Controls: 40 CFR 266.104(c)

   BIFs that are equipped with a dry particulate matter control device that operates within the temperature range of 450 - 750° F, and industrial furnaces operating under an alternative hydrocarbon limit established under 266.104(f) must conduct a site-specific risk assessment as described in 266.104(e) to demonstrate that emissions of chlorinated dibenzo-p-dioxins and dibenzofurans do not result in an increased lifetime cancer risk to the hypothetical maximum exposed individual exceeding 1 in 100,000.

5. Particulate Matter (PM) Emissions Standard: 40 CFR 266.105(a)

   PM cannot exceed 180 mg/dscm corrected to 7% oxygen (0.08 grains/dscf).

6. Metals Emissions Standard: 40 CFR 266.106, 266 Appendix I

   Owners/operators of BIFs must comply with either the Tier I, Tier II, Tier III, or Adjusted Tier I metals feed rate limits.

   The facility must use Tier III metals controls if any of the following criteria are met:

   -The device is located in a narrow valley less than 1 km wide.

   -The device has a stack taller than 20 meters and is located such that the terrain rises to the physical height within 1 km of the facility.

   -The device has a stack taller than 20 meters and is located within 5 km of a shoreline of a large body of water, such as an ocean or large lake.

   -The physical stack height of any stack is less than 2.5 times the height of any building within 5 building heights or 5 projected building widths of the stack, and the distance from the stack to the closet boundary is within 5 building heights or 5 projected building widths of the associated building, **or**

   -IDEM determines that standards based on site-specific dispersion modeling are required.

7. Hydrogen Chloride/Chlorine Emissions Standards: 40 CFR 266.107, 266.107(b)(3), 40 CFR 266 Appendices II - IV

   HCl/Cl_2 must meet either Tier I, Tier II, Tier III, or Adjusted Tier I feed rate limits.

   The facility must use Tier III HCl/Cl_2 controls if any of the following criteria are met:

   -The device is located in a narrow valley less than 1 km wide.

   -The device has a stack taller than 20 meters and is located such that the terrain rises to the physical height within 1 km of the facility.

   -The physical stack height of any stack is less than 2.5 times the height of any building within 5 building heights or 5 projected building widths of the stack, and the distance from the stack to the closet boundary is within 5 building heights or 5 projected building widths of the associated building, **or**

   -IDEM determines that standards based on site-specific dispersion modeling are required.

F. ▶ ▶ PROCEDURES TO PREVENT HAZARDS

F-2b(9) Boilers and Industrial Furnaces (BIF) Inspections: 40 CFR 264.15, 266.102(a)(2)(ii), 266.102(e)(8), 266.111(e)(3)

Demonstrate that the BIF will be subject to thorough visual inspections when it contains hazardous waste (at least daily) for signs of leaks, spills, fugitive emissions, and tampering.

Automatic waste feed cut-off systems must be tested at least once every 7 days when hazardous waste is burned, unless the applicant demonstrates that weekly inspection unduly upset operations. Minimum, testing must be conducted once every 30 days. A description of automatic feed cut-off system testing procedures must be included.

Demonstrate that the owner/operator will inspect direct transfer areas at least once each operating hour when hazardous waste is being transferred from the transport vehicle (or container) to the BIF.

I. CLOSURE PLANS, POST-CLOSURE PLANS, AND FINANCIAL REQUIREMENTS

I-1e(12) ▶ ▶ Closure of Boilers and Industrial Furnaces (BIFs): 40 CFR 266.102(a)(2)(vii)

Describe how, at closure, all hazardous waste and hazardous waste residues (including, but not limited to, ash, scrubber waters, and scrubber sludges) will be removed from the BIF unit, associated ductwork, piping, air pollution control equipment, sumps, and any other structures or operating equipment such as pumps, valves, etc., that have come into contact with hazardous wastes. Alternately, describe how the BIF and associated equipment will be dismantled and disposed of. If any wastes, waste residues, contaminated components, subsoils, structures or equipment remain after closure, provide plans for closing the BIF unit as a landfill and provide a post-closure care plan.