

NESHAP 5D & 6J Boiler Flowchart

This tool/flowchart is only for determining NESHAP applicability, not for determining whether a permit or other regulation like NSPS applies to the process equipment and does not address NESHAP. (40 CFR 241)

See Policy and Procedure AQR-011 stationary source determinations. See <http://www.epa.gov/ttn/chief/ap42/ch01/index.html>, <http://www.epa.gov/ttn/chief/eiip/techreport/volume02/ii02.pdf>, and DEQ Potential to Emit Web page at http://www.michigan.gov/deq/0,4561,7-135-3310_4148-112202--,00.html for area/major HAP source determinations, and 40 CFR 63.7575 for major source definition for oil and natural gas production facilities. (40 CFR 63.2)

Industrial sector examples include manufacturing, service, mining, and refining sector boilers. Commercial or institutional boiler examples include those at medical centers, research centers, municipal offices, schools, restaurants, hotels, laboratories and laundries. (40 CFR 63.7575)

NESHAP 5D and 6J applies to stationary sources, not mobile sources, like locomotives or vehicles. (40 CFR 63.2)

START

Is the **stationary** source a **major** source of Hazardous Air Pollutants?

Review area source NESHAP 6J applicability for each boiler.

See page 3 **6J Boiler** flowchart

YES

Review major source NESHAP 5D applicability for **EACH** boiler or process heater at the stationary source.

A process heater is an enclosed device with a controlled flame that has a primary purpose of indirectly transferring heat instead of generating steam. Indirect process heaters include devices in which the combustion gases do not come into direct contact with process material, including gases. For example a heat treat furnace with direct heat is not subject, but a glycol heater where there is indirect contact, would be a process heater. (40 CFR 63.7575)

A boiler is an enclosed device that uses controlled flame combustion and has the primary purpose of recovering thermal energy in the form of steam or hot water. (40 CFR 63.)

Does source have a commercial, industrial or institutional **boiler**?

Does the source have a **process heater** providing indirect heat?

Source does not have a unit subject to NESHAP 5D.

Exempted/excluded units include:

- residential boilers serving ≤ 4 families or a converted single unit dwelling;
- temporary boilers burning gas or liquid fuel and are capable of being carried or moved from 1 location to another using wheels, skids, handles, dollies, trailers, or platforms and are NOT attached to a foundation, nor remaining at 1 location for more than 12 consecutive months, and NOT located at a seasonal facility where it is used for the operating season for 2 years, at least 3 months annually;
- hazardous waste and solid waste incinerators;
- boilers subject to another NESHAP (e.g. EGU)
- control devices with ≥ 50% of the gas stream coming from a controlled gas stream;
- hot water heaters with < 120 gal capacity; hot water boilers not generating steam with a capacity < 1.6 MM BTU/hr fired by gas, oil or biomass; and tankless on-demand hot water heaters;
- waste heat boilers (heat recovery steam generators) that recover normally unused hot exhaust gas, converting it to usable heat or steam, including those with duct burners;
- research & development (R & D) boilers (e.g. test boilers), not to be confused with R & D facilities; and
- blast furnace boilers/stoves receiving ≥ 90% of total annual gas from blast furnace gas. (40 CFR 63.7491)

YES

Is the **process heater** excluded or exempted?

Unit is not subject to NESHAP 5D process heater requirements.

Exempted/excluded units include:

- process heaters used for food preparation for on-site consumption;
- autoclave process heaters that use steam to sterilize equipment to deactivate bacteria, viruses, fungi, and spores;
- waste-heat or recuperative process heaters, both fired and unfired, that use hot exhaust gas normally unused for recovering heat;
- comfort/space process heaters;
- research & development (R & D) process heaters, not to be confused with R & D facilities;
- blast furnace process heaters receiving ≥ 90% of total annual gas from blast furnace gas;
- process heater subject to another NESHAP (e.g. EGU); and
- hot water heaters with < 120 gal capacity, hot water boilers not generating steam with a capacity < 1.6 MM BTU/hr fired by gas, oil or biomass, and tankless on-demand hot water heaters. (40 CFR 63.7491)

Is the **boiler** excluded or exempted?

NO

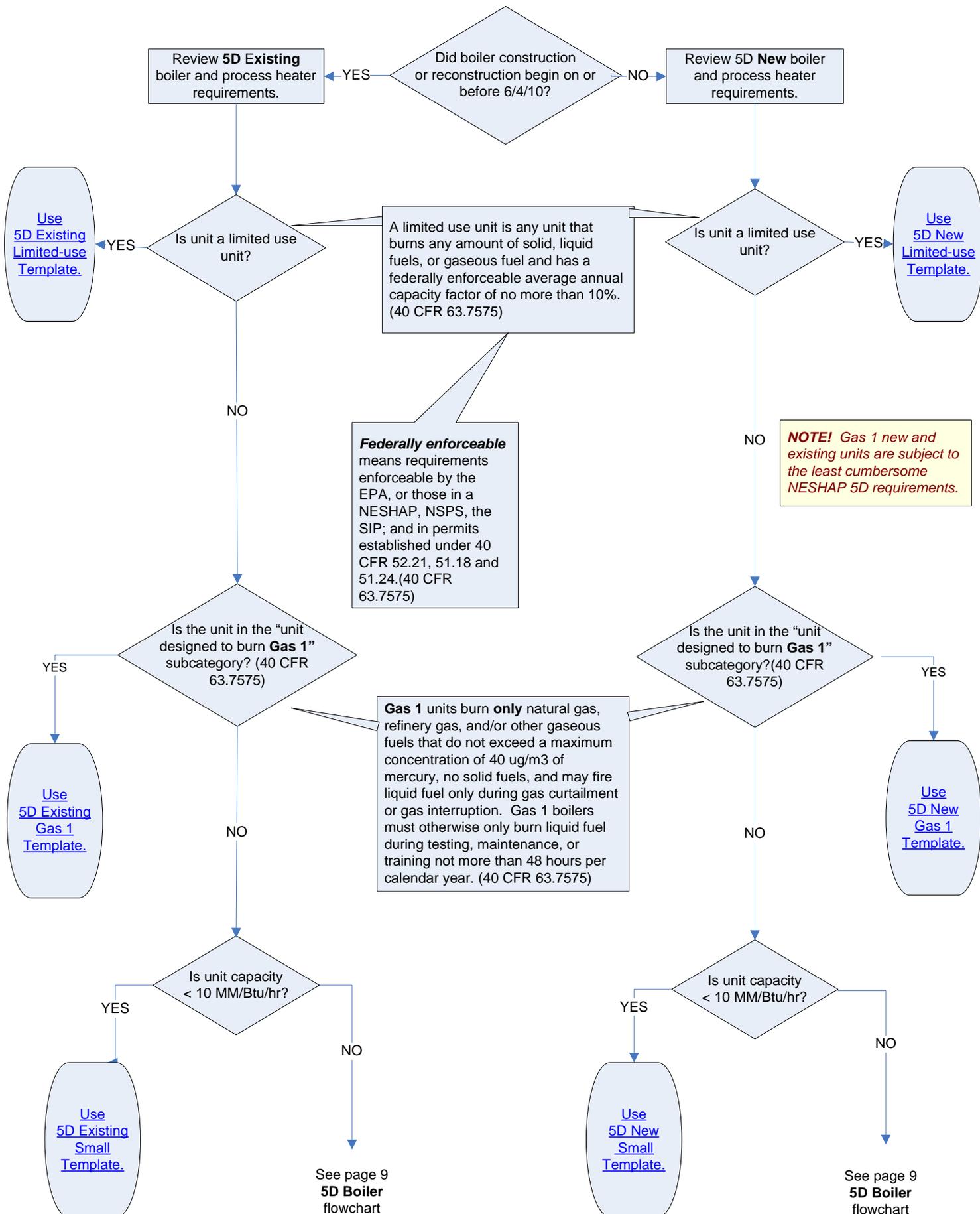
Calculate the [annual heat input for your unit.](#)

See page 2 **5D Boiler** flowchart

Unit is not subject to NESHAP 5D boiler requirements.

NOTE! 5D Michigan permit templates are under construction. Hyperlinks will be active when the template is available.

NESHAP 5D Boiler
flowchart
continued from
Page 1



NOTE! Gas 1 new and existing units are subject to the least cumbersome NESHAP 5D requirements.

**NESHAP 6J
Boiler**
flowchart
continued from
Page 1

Industrial sector examples include manufacturing, service, mining, and refining sector boilers. Commercial and institutional boiler examples include those at medical centers, research centers, municipal offices, schools, restaurants, hotels, laboratories, and laundries. (40 CFR 63.11237)

A boiler is an enclosed device that uses controlled flame combustion and has the primary purpose of recovering thermal energy in the form of steam or hot water. (40 CFR 63.11237)

Review area source NESHAP 6J Boiler applicability - review all questions for each boiler.

Exempted/excluded units include:

- residential boilers serving ≤ 4 families or a converted single unit dwelling;
- temporary boilers burn gas or liquid fuel and is capable of being carried or moved from 1 location to another using wheels, skids, handles, dollies, trailers, or platforms and are NOT attached to a foundation, nor remaining at 1 location for more than 12 consecutive months, and NOT located at a seasonal facility where it is used for the operating season for 2 years, at least 3 months annually;
- hazardous waste boilers and solid waste incinerators;
- boilers subject to another NESHAP (e.g. EGU);
- control devices for which 50% of average annual heat input during 3 consecutive calendar years was provided by the regulated gas stream subject to another standard;
- hot water heaters with < 120 gal capacity; hot water boilers not generating steam with a capacity < 1.6 MM BTU/hr fired by gas, oil or biomass; and tankless on-demand hot water heaters;
- waste heat boilers (heat recovery steam generators) that recover normally unused hot exhaust gas, converting it to usable heat or steam, including those with duct burners;
- research & development (R & D) boilers (e.g. test boilers), not to be confused with R & D facilities;
- electric boilers;
- process heaters or enclosed devices with a controlled flame that have a primary purpose of indirectly transferring heat instead of generating steam. Indirect process heaters include devices in which the combustion gases do not come into direct contact with process materials. Process heaters include units that heat water mixtures for pool heating, sidewalk heating, cooling tower water heating, power washing, or oil heating; and
- autoclave process heaters that use steam to sterilize equipment to deactivate bacteria, viruses, fungi, and spores. (40 CFR 63.11195)

Unit is not subject to NESHAP 6J boiler requirements.

Does source have a commercial, industrial or institutional boiler?

Unit is not subject to NESHAP 6J boiler requirements.

Is boiler excluded or exempted?

Unit is not subject to NESHAP 6J boiler requirements.

Is boiler gas fired?

Maintain records to demonstrate exemption applicability, including records documenting each boiler's fuel design and fuel usage.

Gas boilers burn natural, process, landfill, coal-derived, refinery, hydrogen and/or bio gas(es), no solid fuels, and may fire liquid fuel during periods of gas curtailment, gas supply interruption, startups, or periodic testing on liquid fuel. Periodic testing of liquid fuel shall not exceed a combined total of 48 hours during any calendar year. (40 CFR 63.11237)

Review **6J Existing** boiler requirements.

Did boiler construction or reconstruction begin on or before 6/4/10?

Review **6J New** boiler requirements.

[Use 6J Existing Limited-use Boiler Template.](#)

Is boiler a limited use boiler?

A limited use boiler is any boiler that burns any amount of solid, liquid fuels, or gaseous fuel and has a federally enforceable average annual capacity factor of no more than 10%. (40 CFR 63.11237)

Is boiler a limited use boiler?

[Use 6J New Limited-use Boiler Template.](#)

Federally enforceable means requirements enforceable by the EPA, or those in a NESHAP, NSPS, the SIP; and in permits established under 40 CFR 52.21, 51.18 and 51.24. (40 CFR 63.11237)

Is boiler capacity < 10 MM/Btu/hr?

Is boiler capacity < 10 MM/Btu/hr?

Review **6J Existing Small** boiler requirements.

Review **6J Existing Large** boiler requirements.

Review **6J New Small** boiler requirements.

Review **6J New Large** boiler requirements.

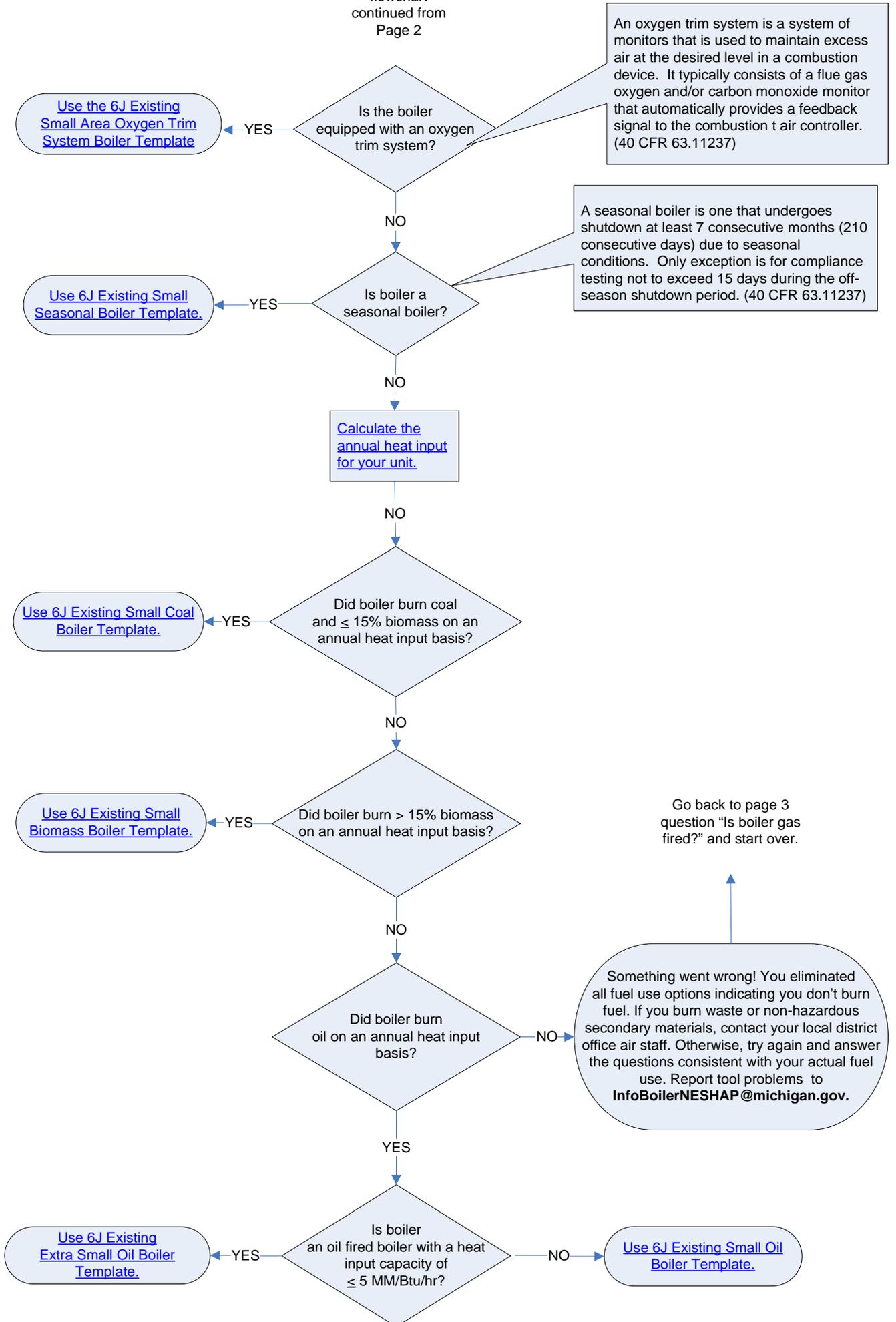
See page 3 existing small area source boiler flowchart

See page 4 existing large area source boiler flowchart

See page 5 new small area source boiler flowchart

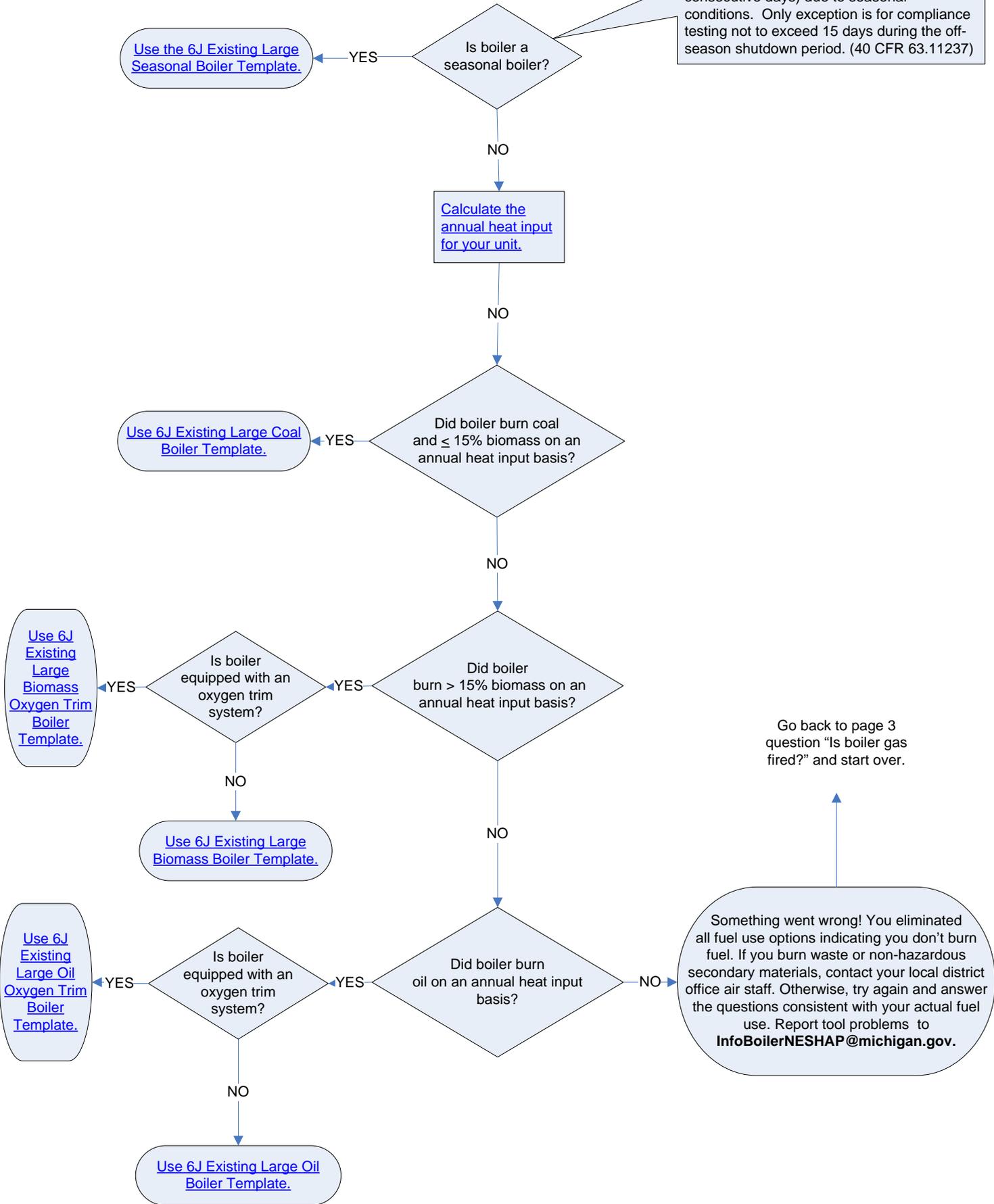
See page 6 new large area source boiler flowchart

**NESHAP 6J
Existing Small
Boiler**
flowchart
continued from
Page 2

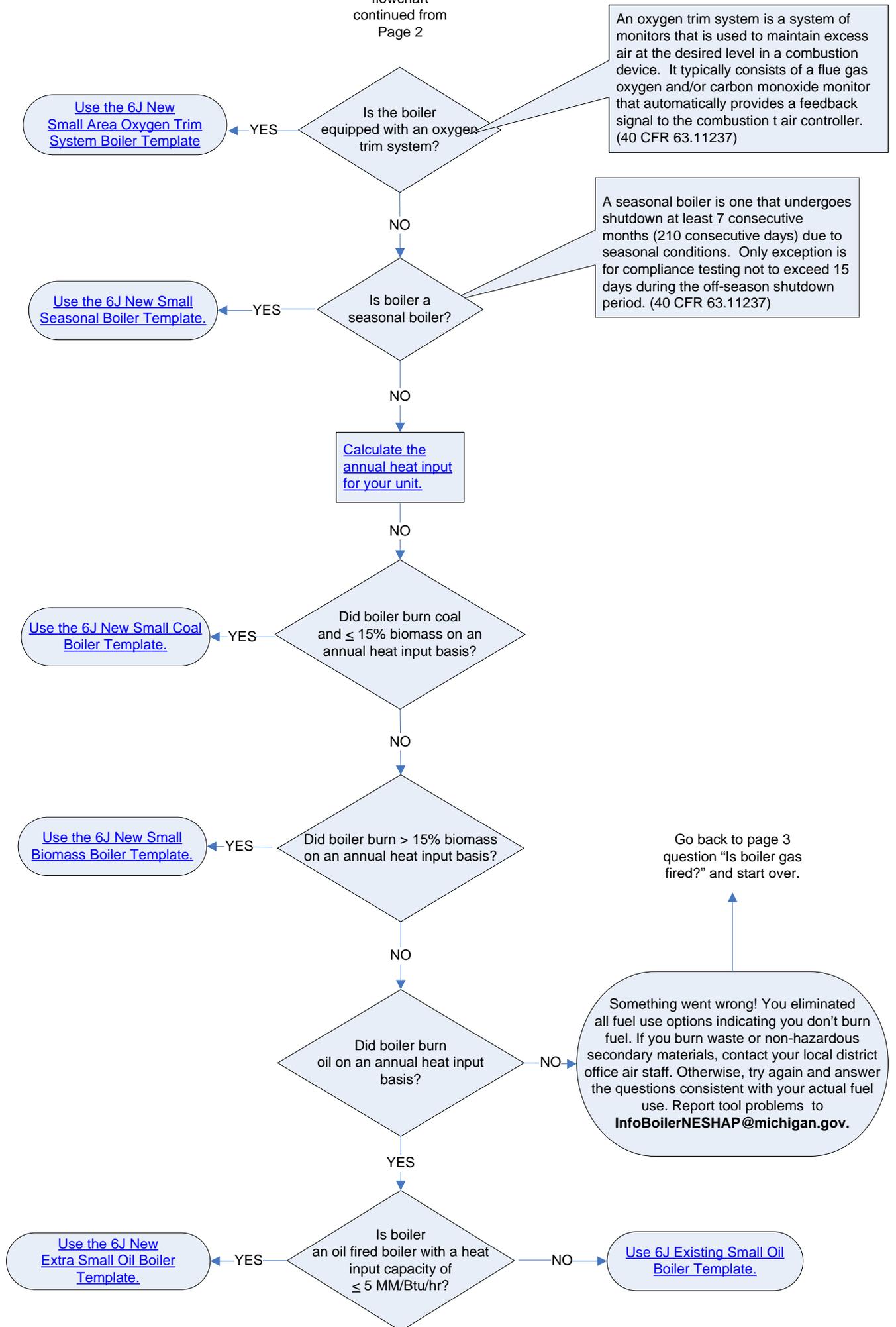


**NESHAP 6J
Existing Large
Boiler**
flowchart
continued from
Page 2

A seasonal boiler is one that undergoes shutdown at least 7 consecutive months (210 consecutive days) due to seasonal conditions. Only exception is for compliance testing not to exceed 15 days during the off-season shutdown period. (40 CFR 63.11237)

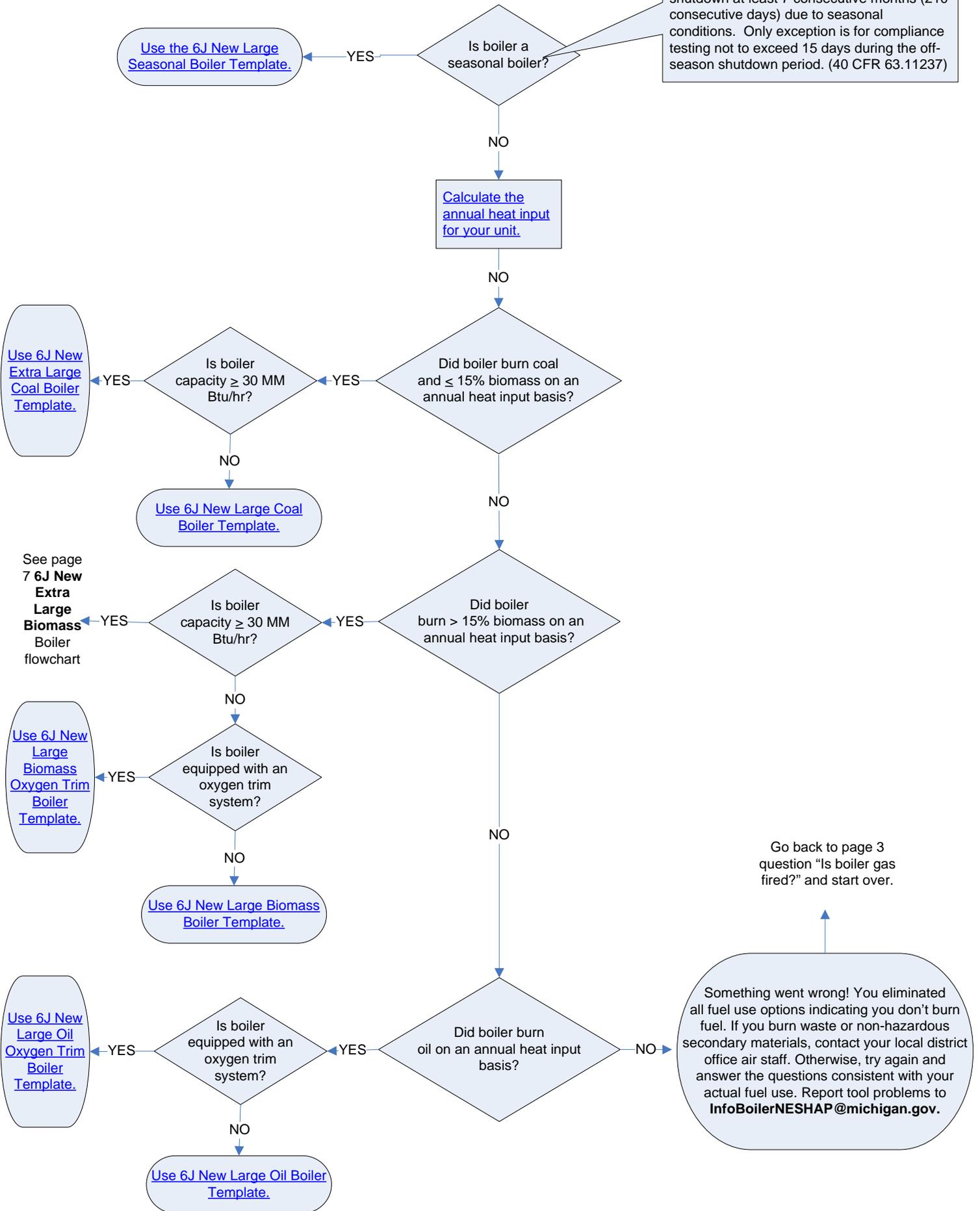


**NESHAP 6J
New Small
Boiler**
flowchart
continued from
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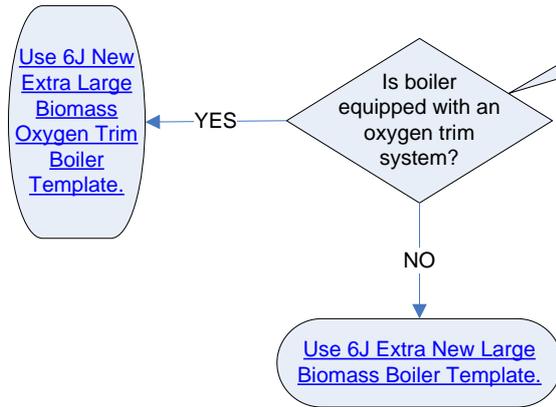


**NESHAP 6J
New Large
Boiler**
flowchart
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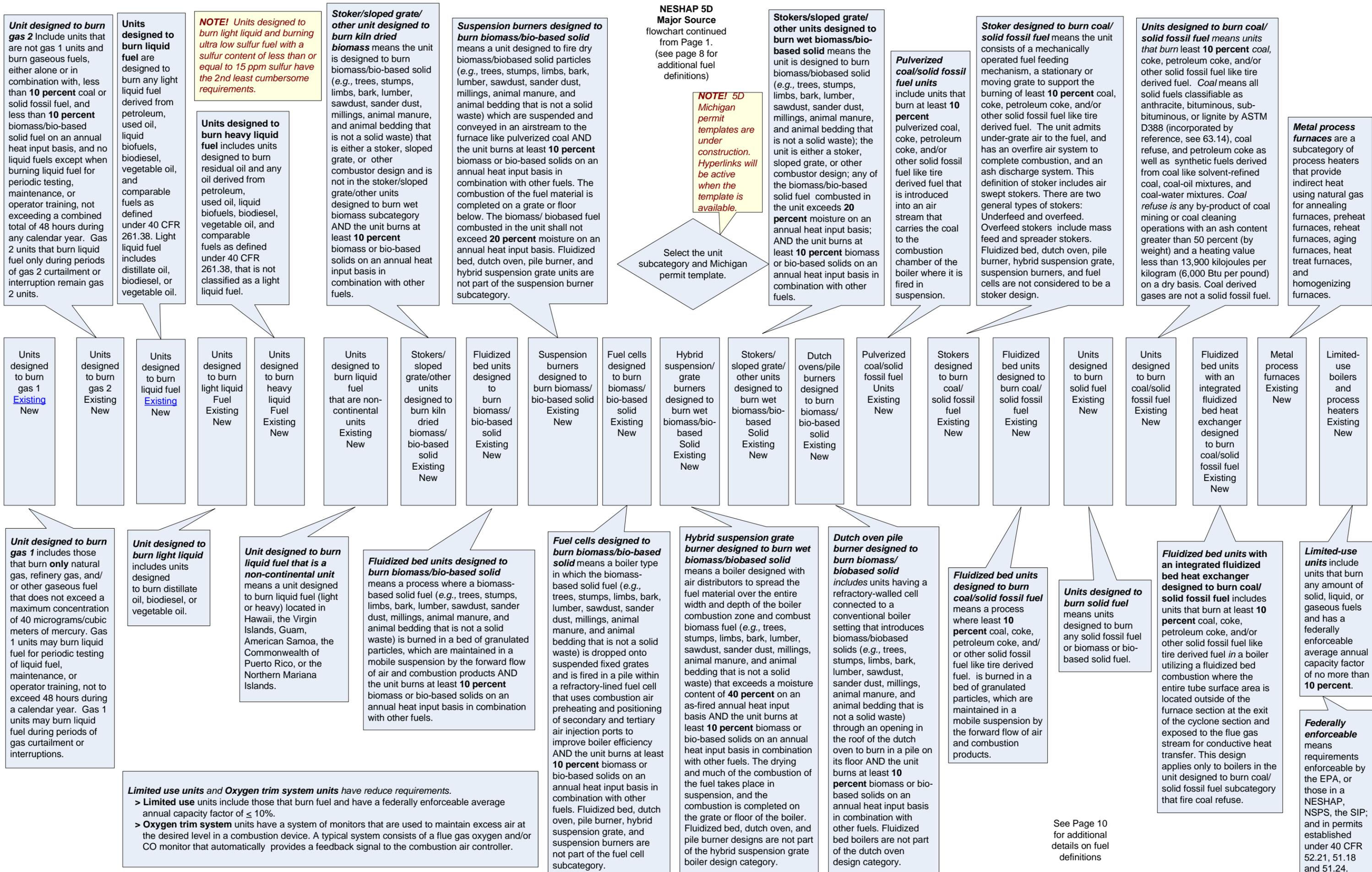
A seasonal boiler is one that undergoes shutdown at least 7 consecutive months (210 consecutive days) due to seasonal conditions. Only exception is for compliance testing not to exceed 15 days during the off-season shutdown period. (40 CFR 63.11237)



NESHAP 6J
New Extra Large
Biomass Boiler
flowchart
continued from
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An oxygen trim system is a system of monitors that is used to maintain excess air at the desired level in a combustion device. It typically consists of a flue gas oxygen and/or carbon monoxide monitor that automatically provides a feedback signal to the combustion air controller. (40 CFR 63.11237)



NESHAP 5D
Major Source
flowchart fuel
definitions
associated with
page 9
subcategories.

Fuel Definitions:

Biomass or bio-based solid fuel means any biomass-based solid fuel that is not a solid waste. This includes, but is not limited to, wood residue; wood products (e.g., trees, tree stumps, tree limbs, bark, lumber, sawdust, sander dust, chips, scraps, slabs, millings, and shavings); animal manure, including litter and other bedding materials; vegetative agricultural and silvicultural materials, such as logging residues (slash), nut and grain hulls and chaff (e.g., almond, walnut, peanut, rice, and wheat), bagasse, orchard prunings, corn stalks, coffee bean hulls and grounds. This definition of biomass is not intended to suggest that these materials are or are not solid waste.

Coal means all solid fuels classifiable as anthracite, bituminous, sub-bituminous, or lignite by ASTM D388 (incorporated by reference, see □ 63.14), coal refuse, and petroleum coke. For the purposes of this subpart, this definition of "coal" includes synthetic fuels derived from coal, including but not limited to, solvent-refined coal, coal-oil mixtures, and coal-water mixtures. Coal derived gases are excluded from this definition.

Coal refuse means any by-product of coal mining or coal cleaning operations with an ash content greater than 50 percent (by weight) and a heating value less than 13,900 kilojoules per kilogram (6,000 Btu per pound) on a dry basis.

Solid fossil fuel includes, but is not limited to, coal, coke, petroleum coke, and tire derived fuel.

Solid fuel means any solid fossil fuel or biomass or bio-based solid fuel.

Fuel Definitions:

Distillate oil means fuel oils that contain 0.05 weight percent nitrogen or less and comply with the specifications for fuel oil numbers 1 and 2, as defined by the American Society of Testing and Materials in ASTM D396 (incorporated by reference, see □ 63.14) or diesel fuel oil numbers 1 and 2, as defined by the American Society for Testing and Materials in ASTM D975 (incorporated by reference, see 63.14), kerosene, and biodiesel as defined by the American Society of Testing and Materials in ASTM D6751–11b (incorporated by reference, see □ 60.14).

Heavy liquid includes residual oil and any other liquid fuel not classified as a light liquid.

Light liquid includes distillate oil, biodiesel, or vegetable oil.

Liquid fuel includes, but is not limited to, light liquid, heavy liquid, any form of liquid fuel derived from petroleum, used oil, liquid biofuels, biodiesel, vegetable oil, and comparable fuels as defined under 40 CFR 261.38.

Ultra low sulfur liquid fuel means a distillate oil that has less than or equal to 15 ppm sulfur.

Fuel Definitions:

Gaseous fuel includes, but is not limited to, natural gas, process gas, landfill gas, coal derived gas, refinery gas, and biogas. Blast furnace gas and process gases that are regulated under another subpart of this part, or part 60, part 61, or part 65 of this chapter, are exempted from this definition.

Natural gas means: (1) A naturally occurring mixture of hydrocarbon and non-hydrocarbon gases found in geologic formations beneath the earth's surface, of which the principal constituent is methane; or (2) Liquefied petroleum gas, as defined in ASTM D1835 (incorporated by reference, see □ 63.14); or (3) A mixture of hydrocarbons that maintains a gaseous state at ISO conditions. Additionally, natural gas must either be composed of at least 70 percent methane by volume or have a gross calorific value between 35 and 41 mega joules (MJ) per dry standard cubic meter (950 and 1,100 Btu per dry standard cubic foot); or (4) Propane or propane derived synthetic natural gas. Propane means a colorless gas derived from petroleum and natural gas, with the molecular structure C₃H₈.

Other gas 1 fuel means a gaseous fuel that is not natural gas or refinery gas and does not exceed a maximum concentration of 40 micrograms/cubic meters of mercury.