Combusting Biofuels in Wisconsin

The following information is intended to provide a preliminary overview of the State's environmental regulations. To ensure effective and efficient communication and permitting, **the Wisconsin Department of Natural Resources (DNR) *strongly* encourages those interested in burning biofuels to contact the DNR in the *early stages of planning*.**

DNR is the primary state agency assigned to protect the state's air, land and water resources. Determining which permits and regulatory approvals are needed as early as possible in the project planning process is critical.

Early coordination is useful for screening the project site/sites for possible presence of and conflicts with sensitive resources or other protected sites such as:

- Endangered/threatened species or their habitats,
- Natural/scientific areas and recreation use areas (parks, forests, trails, fishery/wildlife, etc.),
- Sensitive or protected water resources, and
- Water supply wells that are operated by a utility to serve the public
- Air

NOTE: General air, storm water, and wastewater permits are necessary prior to construction.

Screening for sensitive resources during concept planning will help avoid complications and controversy later on. The DNR Permit Primer is a useful tool that can help guide you through the types of permits you will need for biofuel combustion facilities specific to water supply, storm water management, solid waste, hazardous waste, and air management. It can be found by clicking here.

Smaller facilities may obtain additional technical assistance on the DNR permits through the Small Business Environmental Assistance Program (SBEAP). Contact information for DNR's SBEAP may be found by clicking here.

Evaluation for feasibility of installing a biomass combustion operation starts with a site evaluation, followed by determining a water supply and acquiring the required DNR permits. These resources are for "clean biomass" projects, meaning that the biomass is not recycled material that has previously been used for another purpose or where a substance such as a solvent, paint or other treatment material has been added to the biomass. To make the determinations on impacts and permits, you will need the following information:

- Location of the property;
- Knowledge on how materials such as biofuels and waste ash will be stored;
- Water supply, whether by municipal or well systems;
- If wastewater will be generated from operations such as clean-up;
- Waste management such as disposal and recycling;
- If chemicals or solvents will be used and what is their chemical composition, how will they be stored and disposed;
- The manufacture specifications of the combustion unit or boiler plate showing the maximum energy rate of the system;
- The type of fuel being combusted; and
- Testing of ash for contamination or chemical compounds.

The above topics are covered in greater detail on the following pages.

Site Evaluation:

If you are constructing a new facility, where there are no other buildings or structures currently you should first understand the environmental condition of the land. If you are constructing within an existing facility or structure, skip to the next section.

To complete this section, you will need to know:

- Location of the property
- Knowledge on how materials such as biofuels and waste ash will be stored
- Water supply, whether by municipal or well systems

This section will answer the following questions:

1. **Is the property on a wetlands or shoreline?**
2. **Will there be storm water runoff?**
3. **Will customers or employees have access to drinking water from other than a municipal system?**
4. **Does the property have contamination of pollutants in the soil or ground water?**
    a. **Is the property listed in the DNR's Bureau of Remediation and Redevelopment's list as a contaminated property?**
    b. **Is an environmental site assessment required and what is an environmental site assessment?**
5. **Will the project be disturbing land or water where rare species are living?**
6. **Will your project affect a registered historical or archaeological site?**

1. **Is the property on a wetlands or shoreline?**

   Not sure if your property or a property you are thinking of purchasing contains wetlands? First, you will want to walk the property to check for signs of wetlands. The DNR also has wetland inventory and soils maps to help you make a determination. However, these maps are just a guide. Only a professional wetland delineator can verify whether or not wetlands are present.

   The DNR regulates the protection of wetlands and requires you to avoid filling wetlands whenever possible.

   In order to avoid issues with federal and state regulations site planning should avoid construction in or near wetlands. If there are questionable areas on the proposed site it is strongly recommended that contact be made with the DNR staff as early as possible in the planning process.

   If you will be excavating, grading, filling, removing or disturbing soil in a low area or wetland, you will need to get a permit which will require demonstrating that the proposed wetland impact cannot be avoided or reduced. You will also have to show that the project will not significantly harm the wetland's functions and values. General permits are available for some activities while others will require individual permits. A pre-application meeting with the DNR is required for individual permits to help you work through the requirements.

   The Army Corps of Engineers, local counties, and municipalities also regulate wetlands. You will want to contact them early to learn about how their requirements will influence your project.

   The DNR also regulates impacts to navigable waterways, which include wetland disturbance or shoreline development. Activities such as placing materials in a waterway, dredging, grading, constructing intake or outfall structures; and building or repairing boathouses, boat ramps, boat shelters, piers, docks, or wharves or controlling aquatic plants may require permits from the DNR, the Army Corps of Engineers, your county, or other local zoning authority. Other regulations that may influence your project include setbacks for structures, minimum lot sizes, restrictions on cutting vegetation, installing a septic system or well or building a walkway or stairs to the water. Contact your local zoning administrator for help determining which regulations apply.

   More information regarding wetlands can be found here.

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2. Will there be storm water runoff?

Storm water regulations control runoff from locations like parking lots, construction sites and industrial storage yards where rain or snowmelt can pick up contaminants and run into bodies of water. If your business stores materials outdoors where they may expose storm water to contaminants or you will be doing construction, a DNR storm water permit may be needed. For construction, you may need to create a plan for controlling runoff and install best management practices to reduce storm water pollution. For industrial activities, you may need to develop a storm water pollution prevention plan to address contamination of storm water runoff. An industrial facility with no exposed materials may also qualify for No Exposure Certification, in which an industrial storm water permit will not be needed.

The storm water program addresses two primary activities that a business may undertake: Construction/expansion activities and storm water management once the business is operating.

If your business will be disturbing one acre or more of land, you will need to comply with the construction site storm water discharge permit requirements, which can be found here.

There are fees associated with the construction site storm water permit process which are the following:

Acres of Land Disturbance	Application Fee
At least 1 but less than 5	$ 140
5 or more and less than 25	$ 235
25 or greater	$ 350

If your business will involve industrial activities during operation, you may need to comply with the industrial storm water discharge permit requirements, which can be found here.

More information regarding storm water runoff can be found here.

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3. **Will public or employees have access to drinking water from somewhere other than a municipal system?**

   If the answer is no, you are not operating a private or public drinking water system and you are not subject to the public drinking water requirements.

   If the answer is yes, you are operating a private or public drinking water system.

   i) Will this be a new well and have a capacity of greater than 70 gallons per minute or located at a property with a total well capacity of greater than 70 gallons per minute?

   If the well for water is new and will have a capacity of greater than 70 gallons per minute, a high capacity well approval will be required. This requires preapproval of the well. In addition, a licensed well driller, pump installer and plumber are required. Additionally, annual water use reporting is required. More information on high capacity wells can be found here.

   ii) Will there be 25 or more people with access to water per day, 60 or more days per year?

   If yes there will be 25 or more people with access to water per day, 60 or more days per year, this is a "public" water supply system. A pre-approval may be required. Public systems and are subject to construction standards, monitoring, and reporting requirements. In addition, some systems may require certified operators and other notification requirements. More information on public drinking water systems can be found here.

   If the answer is no, there will not be 25 or more people with access to water per day, 60 or more days per year, then this is a private well system. Private systems are subject to notification, construction standards, and sampling requirements.

   Public and private wells may also be high capacity wells where high capacity well requirements apply. Once your well is constructed, protection and maintenance is your responsibility. DNR recommends that you test for bacteriological, nitrate, and arsenic contamination on a yearly basis as well as any time you notice a change in your water.

   More information on private drinking water systems can be found here.

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4. **Does the property have contamination of pollutants in the soil or ground water?**
    a. **Is the property listed in the DNR's Bureau of Remediation and Redevelopment's list as a contaminated property?**

The first step to determine if contamination exists is to check the Bureau of Remediation and Redevelopment's Tracking System, also known as the BRRTS database or the RR Sites Map to see if there is any record of contamination on or near the property within the DNR records.

BRRTS on the Web provides a database of *known* contaminated properties in Wisconsin and activities related to investigation and cleanup. Included in the database are details of both completed and ongoing cleanup actions, emergency spill information and in some cases, DNR determinations that a cleanup will not be required.

The RR Sites Map is a web-based mapping tool which can be used to locate contamination data for a property using a Geographic Information System (GIS) tool. The map can help find information and documents on cleanups that are ongoing, complete and complete with residual contamination and continuing obligations.

More information about using BRRTS and the RR Sites Map can be found at Contaminated Lands Environmental Action Network (CLEAN). **Please note: these databases only contain information on sites that have been reported to the DNR.**

Next it is recommended to do a Phase I assessment since unknown or unreported contamination may still be present, which consists of reviewing the history of the site. A site history is standard due diligence, which may include the following:

- Review Department of Agriculture, Trade and Consumer Protection (DATCP) Storage Tank Database to see if registered underground or aboveground storage tanks are located on the property.
- Real Estate Records such as county land records
- Library
- Sanborn Insurance Maps

Even if contamination has not been identified on the property you intend to purchase, it is a good idea to conduct an environmental site assessment to further evaluate the possibility of contamination. If the site appears to never been used for industrial purposes or another purpose that would suggest contaminations (e.g. orchard), an additional environmental assessment is probably not warranted, but an environmental assessment is still recommended. If a spill has been identified on or near the property, you may want to contact a DNR project manager before purchasing the site. Wisconsin's Spill Law requires the person who causes, possesses or controls a hazardous substance to minimize the harmful effects from

a discharge and restore the environment. The law applies to the owner of the property, regardless of whether the owner caused the discharge.

More information regarding environmental contamination can be found here.

b. Is an environmental site assessment required and what is an environmental site assessment?

The second step in determining if contaminants are on the property is to conduct an Environmental Site Assessment (ESA). An Environmental Site Assessment is not a legal requirement but is often conducted prior to commercial or industrial property transactions in order to evaluate the risk for contamination. In addition, banks often require a Phase 1 environmental assessment prior to approving financing.

A Phase I Environmental Assessment involves research to determine how the property has been used in the past and if the uses may have caused contamination. If the Phase I assessment uncovered cause for concern, a Phase II assessment may be recommended, where samples are taken. An environmental consultant will need to be hired to conduct these assessments.

If contamination is found, there are two options, consult with the DNR's RR program and/or the prospective purchasers consultant:

A. The site may be adequate to purchase and operate upon based upon their review. For example, the site could have been used as a gas station in the past and the tanks were subsequently removed with no remaining soil contamination.
B. Consult and report the findings to DNR. The DNR's Remediation and Redevelopment (RR) Program can assist with determining next steps need to address the contamination and how the contamination issues may impact the use of the property. A site may be required to be closed due to contamination and continued obligations or previously determined closed with restricted use obligations.
C. If recommended by the DNR's RR Program, complete a Phase I environmental assessment and if warranted a Phase II environmental assessment (not required but recommended if contamination exists).

DNR may require a more thorough site investigation to determine the nature, degree, extent and source of the contamination and to determine what actions may be necessary to remediate the site. Make sure the entire site is investigated because the DNR's RR program closes cases, not necessarily the site, given the nature and extent of the contamination or investigation results.

More information regarding environmental contamination can be found here.

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5. Will the project be disturbing land or water where rare species are living?

First determine if an Endangered Resources (ER) review is required.

Go to the National Heritage Inventory (NHI) Public Portal to see if you need a review. You will receive an Endangered Resources Preliminary Assessment when the review is completed. The ER Preliminary Assessment contains a summary of all information entered, a map of the project area and the resulting determination of next steps in regard to endangered resources. If the ER Preliminary Assessment states that either no endangered resources are present or follow-up actions are only recommended, this document can be submitted with DNR permit applications and requests to demonstrate compliance with the Endangered Resources Review Process.

If a full Endangered Resources review is required, it will cost a minimum of $75 in fees for the DNR to complete the review and a review request needs to be completed, by one of three ways:

- Request a standard review from the ER Review Program by submitting an Endangered Resources Review Request [PDF].
- Request an expedited review from the ER Review Program.
- Request a review from a certified reviewer [PDF].

The review will officially determine if endangered resources are present and next steps to be taken.

More information regarding endangered resources can be found here.

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6. Will your project affect a registered historical or archaeological site?

If a construction site storm water permit is needed, DNR storm water staff will screen the project for potential impacts on known historical and archaeological after receiving storm water permit application. If the property contains known resources that are registered as historical or archaeological, the impacts on those resources will need to be resolved before the DNR will confer storm water permit coverage.

If you are interested in finding out if these resources may be present on your property, go to the Wisconsin Historical Society webpage and under "Browse" click "Historic Homes & Properties," and "Preserve Your Homes and Properties." Under this tab, there is a search function for property records. Please be aware that any information you find does not substitute for the screening that DNR storm water staff perform when considering an application. The address of the property should be evaluated to see if it is on the list of historical or archaeological sites.

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Possible Permits for Operations/Processes:

This section is for installing a new process to combust "clean" biomass and process data will be required before the project is constructed. "Clean" biomass means that the biomass is not recycled material that has previously been used for neither another purpose nor where a substance such as a solvent, paint or other treatment material has been added to the biomass. To make the determinations on impacts and permits, you will need the following information:

- Location of the property
- Knowledge on how materials such as biofuels and waste ash will be stored
- If wastewater will be generated from operations such as clean-up
- Waste management such as disposal and recycling
- If chemicals or solvents will be used and what is their chemical composition, how will they be stored and disposed
- Testing of ash for contamination or chemical compounds.
- The manufacture specifications of the combustion unit or boiler plate showing the maximum energy rate of the system
- The type of fuel being combusted

This section will answer the following questions:

1. **Will you be discharging wastewater from one of the operations at your business?**
2. **Will your business generate waste?**
3. **Will your business generate Hazardous Waste?**
4. **Will your business generate air pollution when burning biofuels?**

1. **Will you be discharging wastewater from one of the operations at your business?**

   Common activities of businesses discharging wastewater include:

   - Cooling water
   - Filter backwash
   - Wash water
   - Other process water

   Industrial operations that discharge wastewater to a body of water or to a storm sewer are regulated through the Wisconsin Pollution Discharge Elimination System (WPDES) permit program. If you are treating your water prior to discharge, plans for the treatment system must be approved by the DNR prior to construction. Permit requirements depend on whether your business is considered a major or minor as well as a complex or noncomplex discharger. The major factors that will determine the permit requirements are the volume of water to be discharged, what pollutants are present in the discharge (wastewater characteristics) and the classification of where the water will be discharged to or received by. The water is expected to meet effluent standards when it is discharged so it is important to know the composition of the water being discharged and where it will be discharged to. WPDES permits also apply to the land application of wastewater sludge.

   If your business is discharging your wastewater to a municipal sewage treatment plant instead of directly to a water body, municipal ordinances may apply. Discharges are negotiated with the publically owned treatment works (POTW) and may require controls or pretreatment.

   More information on wastewater permitting can be found here.

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2. Will your business generate solid waste?

Businesses generate solid wastes. Many common activities generate solid wastes. Some common consumer-type solid wastes are banned from landfills:

- Office paper, cardboard, plastic, metal, glass, and food and beverage containers
- Food waste from cafeteria or break rooms
- Used engine oil, anti-freeze, batteries, and other similar wastes
- Office equipment and appliances including computers, monitors, printers, copy machines, toner cartridges, televisions, and microwaves
- Packaging materials such as foam, strapping, plastic wrap, and lumber
- Wastes associated with heating and air conditioning systems, and building maintenance
- Used chemicals, sludge from clean outs, and ash from combustion

All businesses must recycle computers, electronics and fluorescent bulbs unless they are managed as a hazardous waste. There are many other materials that are also banned from landfills. A toolkit is available to assist with managing recycled materials.

Solid waste is defined as garbage, refuse, salvageable material or sludge from a waste treatment plant, water supply treatment plant or air pollution control facility. Be sure to contract with a licensed and reputable solid waste management company for transportation and disposal. If you may burn solid waste in your combustion unit, additional requirements may apply to disposal of the ash. If ash is generated solely from the use of clean wood as a fuel, as disposal may qualify for land application in addition to disposal in landfills. Information about forms and fees is contained in chapter NR 520, Wis. Adm. Code. Because this code is complex, companies are urged to contact a DNR representative for assistance. The permit-approval process typically takes 90 days.

More information on solid waste permitting can be found here.

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3. Will your business generate Hazardous Waste?

Hazardous waste is any discarded material that is not excluded by regulations and appears on one of the four hazardous wastes lists established by EPA regulations and/or exhibits a characteristic of being ignitable, corrosive, reactive or toxic. Examples would be solvents, paints, or possibly ash from biofuels that have burned CCA treated wood or listed solvents. Note that burning materials that are a hazardous waste requires a hazardous waste license from the DNR. To determine if the ash is a hazardous waste, a representative sample would need to be taken and submitted to a Wisconsin certified lab for a chemical composition analysis called a Toxicity Characteristic Leaching Procedure (TCLP).

Businesses are required to follow regulations to treat, store and dispose of hazardous waste. The first step after determining if the waste is subject to exclusion is to determine if the waste is listed or has the characteristics of hazardous waste. Next, the amount of hazardous waste generated will determine which hazardous waste regulations apply. Finally, hazardous waste that is generated will need to be properly disposed of. Be sure to contract with a licensed and reputable hazardous waste management company when disposing of hazardous waste.

A business can determine if it generates hazardous waste by carefully reviewing ch. NR 661, Wis. Adm. Code, and by answering the following questions.

1. Is the material solid waste?
2. Is it excluded from the hazardous waste rules?
3. Is it a listed or characteristic hazardous waste?
4. Is it a mixture containing hazardous waste, or is it derived from hazardous waste?

The publication Is Your Waste Hazardous? (WA-1152) [PDF] can assist you in this hazardous waste identification process.

Additionally, the full Chapter NR 661 Hazardous Waste Identification and Listing [PDF exit DNR] can help you identify any hazardous wastes.

More information on hazardous waste permitting can be found here.

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4. Will your business generate air pollution when burning biofuels?

A combustion source is used to create heat, steam and/or electricity from burning materials in a combustion source. Some examples of combustion sources include boilers, furnaces, space heaters, emergency or back-up generators, or incinerators. This guidance is for businesses. Residential units are not regulated by the DNR but EPA regulations and local ordinances would still apply.

Combustion sources emit criteria pollutants including particulate matter (PM), nitrogen oxides (NO_x), sulfur oxides (SO_x), carbon monoxide (CO), and volatile organic compounds (VOCs). Depending on the type of fuel, different hazardous pollutants also may be emitted. Sources emitting these air pollutants are required to obtain an air pollution permit unless they meet certain exemptions.

An air pollution construction permit probably will be required for a new combustion unit or for modifying an existing unit to combust biofuels. It is unlikely an exemption will be an option unless the biofuels combustion unit is the only operation being added to a facility.

a. EXEMPTION:

In the event the biofuel combustion unit is the only air pollution source at a business, then any unit with a maximum **heat input** rating less than 5 million BTU per hour can be exempt from a construction permit. If you believe your unit is exempt from a construction permit, it is recommended that a permit exemption request for determination be submitted to DNR. A permit exemption costs at least $1250 and is available online. The instructions to fill out the information online are here. In addition, include the following information in your description for the project and as attachments to the exemption application:

- Information from the manufacturer showing that the unit will be less than 5 million BTU per hour
- Property location
- Information on storing the biofuel
- Specify the type of biofuels being combusted
- Reference that an exemption is requested under s. 406.04(1)(a)2., Wis. Adm. Code.

More information on construction permit exemptions can be found here.

If exempt from WI DNR permitting, follow these EPA boiler regulation requirements.

In addition, despite being exempt from the WDNR air permitting process, the unit would still be required to meet EPA requirements for wood-burning units, which are explained on EPA's Burn Wise website and in the Questions and Answers

page for the wood fired boiler rule. For the units exempt from DNR permitting, the requirements of the EPA National Emission Standards for Hazardous Air Pollutants (NESHAP) are the following:

- All new units should be EPA-certified by the manufacturer. The manufacturer should provide a permanent label to the unit. The permanent label must include identifying information for the unit and its compliance certification status. The permanent label must be installed so that it is readily visible both before and after the unit is installed.
- Operate the heater consistent with the owner's manual and not burn improper fuel. Operators must not burn improper fuels such as (1) residential or commercial garbage; (2) lawn clippings or yard waste; (3) materials containing rubber, including tires; (4) materials containing plastic; (5) waste petroleum products, paints or paint thinners, or asphalt products; (6) materials containing asbestos; (7) construction or demolition debris; and (8) paper products; cardboard, plywood or particleboard (Note that best practices do allow the use of fire starters made from paper, cardboard, saw dust, wax and similar substances for the purpose of starting a fire in an affected heater); (9) railroad ties or pressure treated lumber; (10) manure or animal remains; (11) salt water driftwood or other or other previously salt water saturated materials; (12) unseasoned wood; and (13) any materials that are not included in the warranty and owner's manual for the subject heater or furnace.
- Initial Notification of Applicability should be submitted within 120 days after start-up. The applicable standard is 40 CFR part 63 subpart JJJJJJ. The type of affected source is "area source." Also in this case, the Notification of Compliance Status is not required because the unit is less than 10 MMBTU per hour. Information on the rule is explained in this guidance document and on this website.
- Tune-ups are required every 5 years. Here is tune-up guidance and here is an example reporting form.

b. NOT EXEMPT:

If you are building a business with air pollution sources in addition to the biofuels combustion unit then one of the following air permits likely will be needed.

There are two types of construction permits applicable to facilities combusting biofuels:

- Registration Permit: A registration permit allows small emitters to quickly register themselves for a permit in return for keeping emissions low. The permits contain facility-wide emission caps as well as monitoring, recordkeeping and reporting requirements. Registration permits have a review time of no more than 15 days on all applications received by the DNR. Type A Registration Permit Factsheet (AM-364) [PDF] explains the program and who qualifies.

- Source-specific construction permits which are written specific to a facility's operations. Combustion Sources and Construction Permits (AM-427) [PDF] - A fact sheet describing the Air Pollution Construction Permit program and how it affects combustion sources; including calculation examples, definitions and contacts for more assistance. Please note, the fees and exemptions may not be current. Current fees for applications are listed here. Current exemptions are found in chapter NR 406, Wis. Adm. Code.

When required to obtain an air pollution permit you will need to apply for the permit and be issued a final permit from DNR before you begin construction. The Registration Permit can be issued in 15 days, while the source-specific permit can take 90 days or more from the time you submit a complete application to DNR. These are important timelines to keep in mind when planning your operation.

To apply, you will need the following information:

- The rating of the boiler found on the boiler plate, listed by the manufacturer.
- The fuel heating value: the worst case heating value is listed as 4500 British thermal units per pound (Btu/lb) of fuel on a wet, as-fired basis, on the EPA AP42 clearinghouse for inventories & emission factors.
- Emissions of your combustion source. For instructions on how to calculate the air emissions, follow the steps, in the Combustion Sources and Air Pollution Construction Permit Fact Sheet. In addition, the DNR Small Business Environmental Assistance Program can assist with emissions calculations.

More information on registration permits, construction permits and the air pollution permitting process can be found here.

For additional information on combustion sources, EPA has a Burn Wise website and a website on boiler compliance.

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