

Used Oil Management - Satisfying the Rebuttable Presumption

An addendum to WA 233

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Used oil is a valuable commodity. It can be recycled or reused only if it has not been mixed with hazardous waste. Used oil is any oil that has been refined from crude oil or synthetic oil that has been **used and as a result of the use is contaminated** by physical or chemical impurities. Many types of oil or oil-based products can become used oil as defined in NR 679.01(12) Wisconsin Administrative Code. Companies can assure the used oil collected can be managed under NR 679 Used Oil Management Standards¹ by educating employees, using best management practices and engaging in good housekeeping.

Used oil includes: motor oils, greases, emulsions, machine shop coolants, heating media, brake fluids, transmission fluids, other hydraulic fluids, electrical insulating fluids, metal working fluids and refrigeration oils.

Used oil does not include: fuel product storage tanks bottoms, fuel product spill cleanup material, other waste that results from oil that has not been used, animal and vegetable oils and greases, antifreeze and materials used as cleaning agents or only for their solvent properties.

The screening process for recycling used oil

Used oil should be managed under ch. NR 679, if the used oil has not been mixed with hazardous waste.² To recycle the used oil, the used oil handler (the handler) must determine that the used oil has not been mixed with a hazardous waste. U.S. EPA developed a screening process for this purpose. The paragraphs below describe the screening process required by U.S. EPA to determine when used oil has been mixed with a spent hazardous halogenated solvent, or other halogenated hazardous materials.

First, the handler shall determine whether the total halogen content of the used oil is at, above or below 1,000 ppm. The handler can either field or laboratory test the used oil or apply knowledge of the halogen content of the used oil considering the materials or process used. This initial test is used to determine whether the used oil has been mixed with a halogenated material. If the total halogen content is less than 1,000 ppm, the used oil is eligible for recycling as a used oil as described in NR 679. If the total halogen content is at or above 1,000 ppm, the used oil is presumed to have been mixed with a hazardous waste.

Further laboratory analysis must be done to verify the material can be managed as used oil. Total halogen content and the other values in Table 1, s. NR 679.11 will dictate how the waste stream can be managed (i.e., burned for energy recovery, recycled or disposed).

¹ Chapter NR 679, Wisconsin Administrative Code is similar to the federal regulations in 40 CFR 279. This document will reference the state regulations unless the federal regulations are specified. See Resource #3 on page 7 for a summary of these regulations.

² There are a few "exceptions to the rule" in NR 679.10 (2) Mixtures of Used Oil and Hazardous Waste.

Table 1 lists five constituents—arsenic, cadmium, chromium, lead and total halogen— and one property—flash point—that are used to make an on-specification determination for used oil fuel. When the levels of the constituents are below the maximum values and the flash point is above 100° F, the used oil can be used as on-specification fuel and burned as a fuel in a boiler or furnace. In this case, the used oil management standards *do not* apply and the used oil is managed in the same manner as any other fuel.

Table 1: NR 679.11
Used oil not exceeding any specification level is not regulated
under this chapter when burned for energy recovery¹

Constituent and property	Allowable levels
Arsenic	5 ppm maximum
Cadmium	2 ppm maximum
Chromium	10 ppm maximum
Lead	100 ppm maximum
Flash Point	100° F minimum
Total Halogens	4000 ppm maximum ²

¹ The specification does not apply to mixtures of used oil and hazardous waste that continue to be regulated as hazardous waste (see s. NR679.10(2)).

² Used oil containing greater than or equal to 1,000 ppm total halogens is presumed to be a hazardous waste under the rebuttable presumption provided under s. NR679.10(2)(a). This used oil is regulated under sub ch. H of ch. NR 666 rather than this chapter when burned for energy recovery unless the presumption of mixing can be successfully rebutted.

Note: Applicable standards for the burning of used oil containing PCBs are imposed by 40 CFR 761.20(e).

Table 1 has two footnotes that apply to the use of the table values. The first one indicates the specification does not apply to mixtures of used oil and hazardous waste in which the used oil exhibits a characteristic of a hazardous waste or is mixed with a hazardous waste that is listed for toxicity. In other words, you cannot mix used oil and hazardous waste and apply the values in Table 1, even if the mixtures is below the constituent concentration’s allowable value. The second footnote relates to total halogen values.³ Total halogen values greater than or equal to 1,000 ppm in used oil are presumed to be the result of mixing with hazardous waste. To rebut this presumption additional sample analysis would be needed to verify the material can be handled as used oil. This analysis would be used to identify what materials are contributing to the higher total halogen value. Chlorinated solvents, chlorinated paraffins, sea salt and polychlorinated biphenyls (PCBs) in the used oil could contribute to high total halogen values.

Identifying the total halogen value

State and federal regulations indicate that the total halogen content can be determined by either testing or applied knowledge. The regulations indicate that “the owner or operator may rebut the presumption by demonstrating the used oil does not contain hazardous waste.” The word “demonstrating” is further explained in a note in NR 679 that reads, “An example of demonstrating that the used oil does not contain hazardous waste is using an analytical method from EPA SW 846, incorporated by reference in s. NR 660.11, to show that the used oil does not contain significant concentrations of halogenated hazardous constituents listed in NR 661, Appendix VIII.”

³ Note that the total halogen limit of 4,000 ppm operates independently of the 1,000 ppm rebuttable presumption level for determining if listed spent solvents have been mixed into the used oil.

This means the owner or operator must demonstrate the absence of hazardous waste to rebut the presumption that the used oil was mixed with hazardous waste. When appropriate, “applying knowledge” can be used to rebut the presumption. Suspected halogenated hazardous constituents can be identified by reviewing the list of products used and wastes generated at the customer’s facility. The rebuttable presumption may be satisfied, in some cases, by using information on the product safety data sheet (SDS) and/or the process used to create the waste. However, this method does not take into account contamination from use or ingredients of less than 1% (or 10,000 ppm), as they are not typically required to be reported on an SDS.

Satisfying the rebuttable presumption is the responsibility of the used oil handler (generator, transporter, processor and burner). In some cases, the information can be passed from handler to handler, but in each case the receiving handler must have the knowledge to make their own rebuttable presumption determination on the used oil. **Keeping records of these determinations is necessary to demonstrate compliance during regulatory inspections.**

Total halogen content of used oil >1,000 ppm: Rebutting the presumption

If analysis shows that used oil has total halogens above 1,000 ppm, the presumption is that the used oil was mixed with a hazardous waste and must be handled as hazardous waste. U.S. EPA conducted studies that led to the use of total halogens as the indicator and the value of less than 1,000 ppm as a target value. To rebut the presumption, when analysis shows halogen content greater than 1,000 ppm, the handler must *demonstrate* the used oil does not contain hazardous waste.

There are several options to rebut this presumption. The most definitive way to confirm that no hazardous wastes have been mixed with the used oil is through use of a laboratory analysis. In general, used oil should be analyzed, at a minimum, for spent halogenated solvents in the F001/ F002 listing using SW846 Method 8260 and PCBs using Method 8082A. Analysis for these solvents and PCBs is a reasonable starting point to check for the presence of hazardous waste.

If the sample analysis does not rebut the presumption of mixing, the waste stream must be handled & disposed as hazardous waste according to the requirements in chs. NR 660-670.

Very small quantity generator hazardous waste mixed with used oil

Very small quantity generators (VSQGs) are allowed to mix their self-generated hazardous waste with their used oil and manage the mixture as used oil. If the used oil was mixed only with hazardous waste from VSQGs, then sampling is not necessary for the presumption to be rebutted. Section NR 679.10(2)(c) allows mixtures of used oil and VSQG hazardous wastes (the VSQG must be in compliance with NR 662.220) to be managed as used oil under NR 679. This provision does not apply to other generators of hazardous waste (i.e., LQG or SQG facilities) nor does it allow mixing of VSQG waste by parties other than the VSQG. In this case, the used oil handler that is rebutting the presumption must have adequate documentation to demonstrate that VSQGs are the source of the halogens.

It is recommended to keep used oil from VSQGs in a separate tank to avoid compliance questions when rebutting the presumption. If it is necessary to mix VSQG used oil with a larger tank of used oil, be sure to confirm the used oil in the larger tank meets the rebuttable presumption prior to adding the VSQG used oil.

“Significant concentration”

Hazardous halogenated constituents of “significant concentration”—generally values of greater than 100 ppm—would indicate mixing with hazardous waste has taken place. A case specific determination may be necessary to account for the type of hazardous halogenated compound found and the circumstances surrounding the generation and collection of the used oil (see Resource #12 on page 8).

Sample analysis to satisfy the rebuttable presumption must show that the used oil does not contain *significant concentrations* of halogenated hazardous materials. Again, U.S. EPA research studies have determined that significant concentrations of hazardous constituents would have to be added to the used oil to show up in values of over 100 ppm. However, showing that individual hazardous halogenated constituents are present at levels of less than 100 ppm does not automatically rebut the presumption, as other factors must be considered in making a determination. Other factors may include circumstances surrounding the generation and collection of the used oil, and values of multiple hazardous halogenated constituents. Values less than 100 ppm may be significant for some constituents (i.e. polychlorinated biphenyls or PCBs). A list of the halogenated hazardous constituents is located in Appendix B of Resource #11 on page 8 and is titled: Halogenated Hazardous Constituents in Appendices VII and VIII to 40 CFR Part 261 and Associated Hazardous Waste Codes. This is a list of possible halogenated hazardous constituents that may be associated with hazardous wastes. It also identifies the characteristic and listed waste codes for the halogenated hazardous constituents.

Interference when identifying total halogens

When performing lab analysis, chlorinated paraffins, naturally occurring inorganic halogens and PCBs (polychlorinated biphenyls) can create “interference” resulting in elevated levels of total halogens.

Chlorinated paraffins

Chlorinated paraffins in metalworking oils may cause problems when trying to rebut the presumption. Chlorinated paraffins are complex mixtures and their chemical content may differ between manufacturers and when mixed with water for use. Determining the level of chlorinated paraffins in used oil is dependent on the specific batch and/or waste stream involved. The presence of chlorinated paraffins in a waste, such as used metalworking oils, does not by itself make the waste hazardous.

The rebuttable presumption may be satisfied if the used metalworking oil exceeds the 1,000 ppm total halogens concentration solely because of one of three relationships to Appendix VIII Hazardous Constituents in ch. NR 661:

- a) the presence of chlorinated paraffins or other halogenated compounds not listed on Appendix VIII; or,
- b) used metalworking oil does not contain "significant concentrations" (i.e., more than 100 ppm) of hazardous constituents listed on Appendix VIII; or,
- c) halogenated hazardous constituents (as listed on Appendix VIII) are ingredients of the virgin metalworking oil.

Since many used metalworking oils contain significant concentrations of chlorine, oftentimes attributed to the chlorinated paraffins in the metalworking fluid, the 4,000 ppm halogen limit is an important factor in determining where the used oil can be burned for energy recovery.

Inorganic halogens and marine used oil

Total halogen tests measure both organic and inorganic halogens without accounting for the fact that most halogenated hazardous constituents identified in 40 CFR Part 261 are organic compounds. Therefore, used oils—such as marine used oils—that have a significant content of inorganic halogens relative to organic halogens can test greater than 1,000 ppm of total halogens, triggering the rebuttable presumption. One EPA region accepted a total organic halogen content result of less than 1,000 ppm as an adequate rebuttal with the understanding that the used oil was contaminated with sea salt and not halogenated hazardous constituents. EPA agreed with this approach in an interpretive letter (EPA 1986b).



PCBs (polychlorinated biphenyls)

Used oil waste streams across the country are sometimes contaminated with PCBs. Oils containing PCBs can be found in old transformers and capacitors as well as older equipment and machinery. In many cases, the PCB source is unknown, especially if the used oil is from an unmonitored city/town/county-used motor oil drop-off location or other public-used oil collection facility. If a processing facility is accepting used oil from a used oil collection facility, a PCB analysis is warranted to prevent contamination of larger amounts of used oil, containers and tanks, transport vessels and processing facilities. Management of PCB contaminated used oil as well as cleanup of PCB contamination can be costly and cause the temporary shutdown of processing facilities.

Due to the potential for PCB contamination of used oil, the industry standard is to collect a sample of used oil from each customer—known as a retain sample—before adding it to the tanker truck. This sample is then available should further analysis be needed to identify the source of contamination un-attributable to original product or use. “Guard tanks” are also used to keep loads of used oil separate until analytical results can

confirm the used oil is not hazardous waste and/or does not contain PCBs.

The level of PCBs in the used oil makes a difference on how it is handled. Used oil with PCBs greater than 50 ppm is regulated by the U.S. EPA under the Toxic Substance Control Act (TSCA), codified at 40 CFR 761. Furthermore, if PCB contaminated used oil is mixed with other used oil, the disposal of the entire volume must be based on the concentration of PCBs in the PCB contaminant source, if known. Used oil transporters and processing facilities use retain samples from their customer loads to determine the PCB source and source value. Dilution of the PCB concentration is not allowed under federal law to reduce the levels of PCBs for disposal purposes.

In addition to the requirements of ch. NR 679, the applicable standards on marketing and burning used oil containing PCBs are found at 40 CFR 761.20(e). Used oil containing any quantifiable levels of PCBs \geq 2 ppm and $<$ 50 ppm is subject to restricted marketing and burning to qualified incinerators, off-spec marketers and specific used oil burners. State requirements for testing, handlers, and disposal methods and facilities are described in NR 157.

Examples of data evaluation process for the rebuttable presumption

The following examples show how analytical data can be used to the rebuttable presumption. These examples are provided to give examples of the **process of evaluation**. However, most rebuttals will be case and fact specific. All handlers should keep records of their waste stream profiles and rebuttals to document regulatory compliance.

Note: Decision makers should be reviewing the analytical data to satisfy the rebuttable presumption. To avoid confusion, laboratories doing this analysis should be required to report results parts per million (ppm) or milligrams per liter (mg/L) and not in percentages. Using percentages is not appropriate and causes problems when converting to ppm at low values.

- ✓ A used oil sample results is 800 ppm total halogens using a field test kit. This used oil may be recycled by processing or re-refining or burning for energy recovery.
- ✓ A used oil sample results in 3,000 ppm total halogens. These are metalworking oils with chlorinated paraffins. Analysis was conducted for volatile organic compounds (VOCs) and PCBs, using SW 846 Method 8260 and 8082A, respectively. No VOCs or PCBs detected. This result satisfies the rebuttable presumption unless there are other known hazardous halogenated constituents that are used or generated at the generating facility. Manage as used oil.
- ✓ A used oil sample results in 17,000 ppm total halogens. Analysis detected values of greater than 200 ppm F001/F002 VOCs with no PCBs detected. These results do not satisfy the rebuttable presumption and the waste stream must be handled as hazardous waste.
- ✓ A used oil sample indicated PCBs greater than 2 ppm. Check retain sample for source of PCBs. Use source value to determine regulatory authority – U.S. EPA or Wisconsin DNR. If > 50 ppm, notify U.S. EPA Region 5 in Chicago, IL. EPA will conduct an investigation and require clean up action.
- ✓ A used oil sample has total halogens less than 1,000 ppm. This used oil is considered on-spec if all metals and the flash point are within limits of Table 1. If the metals values are greater than the limits in Table 1 then the used oil is off-spec and can be burned for energy recovery in a specific unit.

Used oil as a fuel

The end use of the used oil is important to know when rebutting the presumption. The regulations allow for on-specification used oil fuel to be burned for energy recovery in industrial or non-industrial boilers and furnaces, while off-specification used oil fuel may only be burned in permitted industrial boilers and furnaces (e.g., cement kilns, coke ovens, blast furnaces and smelters) as described in ch. NR 679.61. These burning units are permitted and have pollution control devices and/or monitoring. There are a limited number of industrial boilers and furnaces permitted to burn off-specification used oil fuel, so this option is usually a higher cost option. Generators of used oil may burn their own used oil generated on-site in a space heater provided the conditions of NR 679.23 are met (see Resource #4 on page 7). Table 2 shows how, using the total halogen or organic halogen content of used oil, a hazardous waste and used oil fuel determination can be made.

On-specification used oil fuel is used oil that will be burned for energy recovery and meets all the allowable levels on Table 1 in NR 679.11. On-spec used oil can be burned like any other fuel in non-specific burning units.

Off-specification used oil fuel is used oil that will be burned for energy recovery and does not meet one or more than one of the allowable levels in Table 1 in NR 679.11. Off-spec used oil fuel can be burned only in specific burning

Table 2

Total halogen content, hazardous waste and used oil fuel determination
EPA Used Oil Training Manual (pp. 4-44 to 4-46) (see Resource #19 on page 8)

Total halogen content	Hazardous waste determination	Used oil fuel determination
Less than 1,000 ppm	Used oil: no need to rebut	May be burned in an on-spec unit if used oil meets other specifications (in Table 1, NR 679.11)
Between 1,000 and 4,000 ppm	Hazardous waste: successful rebuttable needed to manage as used oil	With a successful rebuttal, may be burned in an on-specification unit if used oil meets other specifications
More than 4,000 ppm	Hazardous waste: successful rebuttal need to manage as used oil	With a successful rebuttal, must be burned in an off-specification unit regulated under 40 CFR 279, subpart G or undergo further processing to be burned in an on-specification unit

EPA's 1994 draft document, *Used Oil Questions and Answers*, answered the questions, "Is there a halogen level over which it is impossible to rebut the mixing presumption? Can a handler still rebut if the used oil exceeds the specification level of 4,000 ppm total halogens?":

There is no level over which it is impossible to rebut the presumption of mixing. Essentially, if the used oil is burned for energy recovery, three situations are possible.

- 1) Used oil that is below 1,000 ppm total halogens and had not been mixed with hazardous waste is considered used oil and may meet specification if all other Table 1 parameters are met.
- 2) Used oil that is above 1,000 ppm but is below 4,000 ppm total halogens may be regulated as used oil if the presumption is successfully rebutted and may meet specification if all other parameters (in Table 1) are met.
- 3) Finally, used oil that exceeds 4,000 ppm total halogens may be regulated as used oil if the presumption is successfully rebutted, but will be considered off-specification used oil.

Resources

The online resources listed below provide additional references, regulations and other information for used oil handler compliance.

Wisconsin Department of Natural Resources

Visit dnr.wi.gov and search "[waste](#)."

1. Oil Processors & Re-Refiners Reporting Form ([Form 4400-193](#))*
2. Used Oil Processors & Re-Refiners [Inspection Form](#)*
3. Used Oil Management ([WA-233](#))**
4. Burning Used Oil in a Space Heater ([WA-1003](#))**
5. Oil Filters and Absorbents Landfill Ban Questions and Answers ([WA-1503](#))**
6. Chapter [NR 679](#) Used Oil Management Standards, Wis. Adm. Code***
7. Chapter [NR 157](#) Management of PCBs and Products Containing PCBs, Wis. Adm. Code***

* Under the "Hazardous waste" tab, select "Forms & checklists," then look under "Used oil."

** Under the "Resources" tab, select "Publications" and search by title or publication number.

*** Under the "Hazardous waste" tab, select "Administrative code & statutes."

U.S. Environmental Protection Agency

8. Used Oil Management Program Web page
<http://www.epa.gov/wastes/conserva/materials/usedoil/index.htm>
9. Notification of Regulated Waste Activity (US EPA Form 8700-12)
<http://www.epa.gov/epawaste/inforesources/data/form8700/forms.htm>
10. 40 Code of Federal Regulations (CFR) 279
<http://www.epa.gov/osw/conserva/materials/usedoil/regs.htm>
11. Guidance & Summary of Information Regarding the RCRA Used Oil Rebuttable Presumption
<http://www.epa.gov/osw/conserva/materials/usedoil/oil-rebut.pdf>
12. RCRA Online
<http://www.epa.gov/wastes/inforesources/online/index.htm>
13. SW-846 Methods for Determining Chlorine and Other Halogens in Used Oil
<http://www.epa.gov/wastes/hazard/testmethods/pdfs/uoil.pdf>
14. SW-846 Status Table for SW-846
http://www.epa.gov/wastes/hazard/testmethods/sw846/new_meth.htm
15. SW-846 Methods
<http://www.epa.gov/wastes/hazard/testmethods/sw846/>
16. EPA Waste Analysis at Facilities that Generate, Treat, Store & Dispose of Hazardous Waste
<http://www.epa.gov/osw/hazard/tsd/ldr/wap330.pdf>
17. Used Oil Questions and Answers: A Collection of Questions Compiled by the Hotline (1994)
Use search engine of your choice and type in "used oil questions and answers 1994"
18. Managing Used Oil: Advice for Small Businesses
<http://www.epa.gov/wastes/conserva/materials/usedoil/usedoil.htm>
19. EPA Used Oil Training Manual (Document # 950B94001) (1994)
<http://nepis.epa.gov/Advanced.html>

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