BioBlend White Paper:

The BioBlend Oil Spill Advantage

Abstract

The question; "***If I'm using a biodegradable BioBlend bio-lube product technology in my equipment, and we have an oil spill, am I required to report the oil spill?"*** is a critically important question many equipment owners/operators will ask themselves. It is important because in the event the equipment owner/operator has an oil spill, are the requirements the same if they are using a conventional petroleum or conventional synthetic fluid vs. a biodegradable BioBlend bio-lube product technology?

We'll look at two primary categories for oil spills in this paper:

- ✓ ***New Oil Spill:*** This is a finished lubricating fluid that is in a finished lubricant storage vessel and has not been placed into service within a piece of equipment. In other words … it has **NOT** been used.
- ✓ ***Used Oil Spill:*** This is a finished lubricating fluid that has been placed in service within mechanically actuated equipment. In this case, it is important to recognize that federal and state agencies have definitive definitions for what they classify as ***'used oil'***, and that in most cases the biodegradable BioBlend bio-lube product technologies are **NOT** classified as a ***'used oil'*** and as such are **NOT** bound to the prescribed reporting requirements that prevail when a conventional petroleum or synthetic lubricant is used … and spilled in the environment.

We make this designation because the oil spill response is entirely different based on whether or not the spilled oil meets federal and/or state definitions to actually be classified as a ***'used oil'.*** The evidence provided in this paper will clearly substantiate that users of biodegradable BioBlend bio-lube product technologies have a different and significantly lessened oil spill response requirement vs. if they were using a conventional petroleum or conventional synthetic fluid.

To explore the salient advantages to using biodegradable BioBlend bio-lube technologies we will first review the Federal definition of 'used oil', and then we'll explore investigation into specific states requirements, using Minnesota … ***'The Land of 10,000 Lakes'*** … as our example.

Oil Spills and Federal Regulations

40 CFR 279 - Hazardous Waste Laws

The Resource Conservation and Recovery Act *(RCRA)* is a U.S. law that provides, in broad terms, the general guidelines for the waste management program envisioned by Congress. It includes a Congressional mandate directing the EPA to develop a comprehensive set of regulations to implement the law. The hazardous waste program, under RCRA Subtitle C, establishes a system for controlling hazardous waste from the time it is generated until its ultimate disposal — in effect, from "cradle to grave."

In any given State, EPA or the State hazardous waste regulatory agency enforces hazardous waste laws. EPA encourages States to assume primary responsibility for implementing a hazardous waste program through State adoption, authorization, and implementation of the regulations.

This means the handling of used oil and wastes can vary from state to state, with some states adopting the Federal Standard, while others increase or decrease specific regulations that pertain to and impact the businesses and people from that state.

40 CFR 279 - Hazardous Waste Regulations

EPA regulations, or rulemakings, translate the general mandate of RCRA into a set of requirements for the Agency and the regulated community. The RCRA hazardous waste program regulates commercial businesses as well as federal, State, and local government facilities that generate, transport, treat, store, or dispose of hazardous waste. Hazardous waste is a waste with properties that make it dangerous or potentially harmful to human health or the environment. In regulatory terms, a RCRA hazardous wastes fall into two categories:

1. **Listed Wastes:** Which appear on one of the four hazardous wastes lists established by EPA regulations:
    - **The F-list** *(non-specific source wastes),* which can be found in the regulations at 40 CFR §261.31.
    - **The K-list** *(source-specific wastes),* which can be found in the regulations at 40 CFR §261.32.
    - **The P-list and the U-list** (discarded commercial chemical products), which can be found in the regulations at 40 CFR §261.33.
2. **Characteristic Wastes:** Which exhibit one or more of four characteristics defined in 40 CFR Part 261 Subpart C:
    - **Ignitability**, as described in 40 CFR §261.21.
    - **Corrosivity**, as described in 40 CFR §261.22.
    - **Reactivity**, as described in 40 CFR §261.23.
    - **Toxicity**, as described in 40 CFR §261.24.

When it comes to inadvertent oil spills, and what actions must be taken by businesses in the event they spill oil in the environment, which may occur from time to time with any business, the federal government has established general guidelines and published its rulings in 40 CFR 279. In the spirit of providing users of biodegradable BioBlend bio-lube technologies with the advantages of using BioBlend vs. using conventional petroleum/synthetic oils, and to provide direction on what does/does not have to be done in the event of an oil spill, BioBlend looked to the EPA website, reviewing and interpreting the many different rulings and documents as cited in the references. A review of these documents substantiates that the biodegradable BioBlend bio-lube technologies do not fall under the classification of a ***'used oil'***. Thus regulations tied to ***'used oil'*** spills do **NOT** apply.

Managing Used Oil: Advice for Small Businesses

This fact sheet *(Link: http://www.epa.gov/wastes/conserve/materials/usedoil/usedoil.htm)* contains valuable information for businesses that generate and handle used oil. It summarizes the U.S. Environmental Protection Agency's *(EPA's)* used oil management standards--a set of "good housekeeping" requirements for used oil handlers. These requirements are detailed in Title 40 of the Code of Federal Regulations *(CFR)* Part 279. Small businesses should also refer to EPA's Emergency Response Division's Information Line at 202 260-2342 for information on how to manage spills. This document provides answers to the following questions:

- ✓ *What is Used Oil?*
- ✓ *How is Used Oil Recycled?*
- ✓ *Does My Business Handle Used Oil?*
- ✓ *What Standards Should My Business Follow?*
- ✓ *How Should My Business Manage Used Oil Filters?*
- ✓ *How Can My Business Avoid Costly Cleanups?*
- ✓ *What Else Can My Business Do to Conserve Oil?*
- ✓ *Supporting Documents*

Since part of the basis for this paper is related to whether or not the biodegradable BioBlend bio-lube product technologies are even classified as 'used oil', we will only include excerpts related to the first question; *'What is Used Oil?'*.

What is Used Oil?

EPA's regulatory definition of used oil is as follows: Used oil is any oil that has been refined from crude oil or any synthetic oil that has been used and as a result of such use is contaminated by physical or chemical impurities. Simply put, used oil is exactly what its name implies—any petroleum-based or synthetic oil that has been used. During normal use, impurities such as dirt, metal scrapings, water, or chemicals can get mixed in with the oil, so that in time the oil no longer performs well. Eventually, this used oil must be replaced with virgin or re-refined oil to do the job at hand. EPA's used oil management standards include a three-pronged approach to determine if a substance meets the definition of used oil. To meet EPA's definition of used oil, a substance must meet each of the following three criteria:

- ✓ ***Origin****:* The first criterion for identifying used oil is based on the origin of the oil. Used oil must have been refined from crude oil or made from synthetic materials. Animal and vegetable oils are excluded from EPA's definition of used oil.
- ✓ ***Use****:* The second criterion is based on whether and how the oil is used. Oils used as lubricants, hydraulic fluids, heat transfer fluids, buoyants, and for other similar purposes are considered used oil. Unused oil such as bottom clean-out waste from virgin fuel oil storage tanks or virgin fuel oil recovered from a spill, do not meet EPA's definition of used oil because these oils have never been "used." EPA's definition also excludes products used as cleaning agents or solely for their solvent properties, as well as certain petroleum-derived products like antifreeze and kerosene.
- ✓ ***Contaminants:*** The third criterion is based on whether or not the oil is contaminated with either physical or chemical impurities. In other words, to meet EPA's definition, used oil must become contaminated as a result of being used. This aspect of EPA's definition includes residues and contaminants generated from handling, storing, and processing used oil. Physical contaminants could include metal shavings, sawdust, or dirt. Chemical contaminants could include solvents, halogens, or saltwater.

Table of What used Oil Is and Is Not *(Link: http://www.epa.gov/wastes/conserve/materials/usedoil/usedoil.htm)*	
Used Oil Is:*	***Used Oil Is Not:***
• Synthetic oil — usually derived from coal, shale, or polymer-based starting material. • Engine oil — typically includes gasoline and diesel engine crankcase oils and piston-engine oils for automobiles, trucks, boats, airplanes, locomotives, and heavy equipment. • Transmission fluid. • Refrigeration oil. • Compressor oils. • Metalworking fluids and oils. • Laminating oils. • Industrial hydraulic fluid. • Copper and aluminum wire drawing solution. • Electrical insulating oil. • Industrial process oils. • Oils used as buoyants. *** This list does not include all types of used oil.**	• Waste oil that is bottom clean-out waste from virgin fuel storage tanks, virgin fuel oil spill cleanups, or other oil wastes that have not actually been used. • Products such as antifreeze and kerosene. • **Vegetable and animal oil, even when used as a lubricant.** • Petroleum distillates used as solvents. Oils that do not meet EPA's definition of used oil can still pose a threat to the environment when disposed of and could be subject to the RCRA regulations for hazardous waste management.

Conclusions

New Oil Spill: This is a finished lubricating fluid that is in a finished lubricant storage vessel and has not been placed into service within a piece of equipment. In other words … it has **NOT** been used. New oil is not **'used oil'** and is exempt from oil spill reporting requirements. The biodegradable BioBlend bio-lube technologies use biologically derived vegetable oils and/or synthetic ester base oils. New biodegradable BioBlend bio-lube technologies meet current EPA definitions as being Readily Biodegradable and Minimally toxic. In the event they are inadvertently released into the environment, they will have a significantly reduced environmental impact when contrasted to conventional petroleum or synthetic fluids.

Used Oil Spill: This is a finished lubricating fluid that has been placed in service within mechanically actuated equipment. In this case, it is important to recognize that federal and state agencies have definitive definitions for what they classify as ***'used oil'***. The biodegradable BioBlend bio-lube technologies are not classified as ***'used oil'*** as per federal EPA definitions. Unless a state has a definition that differs from the federal definition of 'used oil', in most cases the biodegradable BioBlend bio-lube product technologies are **NOT** classified as a ***'used oil'*** and as such are **NOT** bound to the prescribed reporting requirements that prevail when a conventional petroleum or synthetic lubricant is used … and spilled in the environment.

Oil Spills and State Regulations

The question; ***"If I'm using a biodegradable BioBlend bio-lube product technology in my equipment, and we have an oil spill, am I required to report the oil spill?"*** was first asked by BioBlend customers operating in the state of Minnesota. The state of Minnesota, often called; *'The Land of 10,000 Lakes'* places a huge emphasis on water quality – which is of the utmost importance to the people who live in work within the state. Minnesota is home to many avid outdoor enthusiasts that are proud of the states track-record for offering an environment that supports fishing and other wild game sporting events like trapping and hunting. In short, maintenance of the environment is typically viewed as the responsibility of every resident and business within the state of Minnesota. Further, considering that the state's business economics are so closely tied to environmentally-sensitive businesses such as: agriculture, mining, logging & timber processing regulations are known to be quite sensitive.

To answer questions related to fluid and grease usage, and determine if the use of the biodegradable bio-lube technologies offered by BioBlend would differ in their classifications and handling requirements when compared to conventional petroleum and synthetic lubricants – BioBlend visited the Minnesota Pollution Control Agency *(MPCA)* website *(www.pca.state.mn.us)* and reviewed regulations and publications related to the matter of ***'used oil'*** classification and reporting *(as cited in the references).* BioBlend also visited directly with MPCA representative Joshua Burman, the author that took the work of the MPCA and converted into writing the majority of the MPCA publications that define regulations and guidelines related to oils, lubricants and oil spills.

Minnesota Pollution Control Agency *(MPCA)*
www.pca.state.mn.us
651-296-6300 / 800-657-3864
Joshua Burman
joshua.burman@state.mn.us
507-344-5243

Reporting Oil Spills & Leaks - Minnesota

Minnesota Statute §115.061, which has been in effect since 1969, describes the duty of people to notify the MPCA when oil spills and leaks occur:

115.061 — Duty to Notify and Avoid Water Pollution
(a) Except as provided in paragraph (b), it is the duty of every person to notify the agency immediately of the discharge, accidental or otherwise, of any substance or material under its control which, if not recovered, may cause pollution of waters of the state, and the responsible person shall recover as rapidly and thoroughly as possible such substance or material and take immediately such other action as may be reasonably possible to minimize or abate pollution of waters of the state caused thereby.
(b) Notification is not required under paragraph (a) for a discharge of five gallons or less of petroleum, as defined in section 115C.02, subdivision 10. This paragraph does not affect the other requirements of paragraph (a).

As a general rule businesses operating within the state of Minnesota have historically recognized that oil spills greater than 5 gallons are required to be reported directly to a Minnesota Duty Officer by calling (651) 649-5451 or (800) 422-0798. The duty officer will record all pertinent information and then make the appropriate notifications to the state agencies.

What many businesses have **NOT** recognized is that use of the biodegradable BioBlend bio-lube technologies eliminates the need to report to the MPCA an inadvertent used oil spill, as explained below.

Used Oil & Related Wastes - Minnesota

MPCA Publication w-hw4-30 is titled; ***'Used Oil and Related Wastes'*** *(January 2015)***.** In this document the MPCA provides management guidance for generators of waste and presents the following:

> ***Environmental Concerns:*** *Used oil and related wastes that are improperly managed may release toxic contaminants or heavy metals into the environment. Groundwater and drinking water sources are particularly at risk for pollution from improperly managed used oil. The Minnesota Pollution Control Agency (MPCA) regulates the accumulation, transportation, and disposal of used oil. This fact sheet will discuss the management requirements for generators of used oil and related wastes in Minnesota. The county hazardous waste programs of the Minneapolis-St. Paul metropolitan area (Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, Washington, [Metro Counties]) may have requirements that are more stringent. Contact your Metro County for local requirements.*
>
> ***Used Oil:*** *Used oil includes petroleum-based or synthetic-based oils which have been used as lubricants, hydraulic fluids, heat transfer fluids, or for similar uses. Used oil related wastes include any other waste or debris contaminated with used oil. Table 1 lists examples of wastes regulated as used oil in Minnesota.*

***Table 1: Examples of used oils, related wastes & wastes that are not used* oil**
(Link: *http://www.pca.state.mn.us/index.php/view-document.html?gid=4010)*

Used Oil	*Used Oil Related Wastes*	*Wastes That Are Not Used Oil*
Motor oil	Used oil filters	Fuel oil and other fuels
Transmission fluid	Used floor dry	Crude oil
Hydraulic fluid	Contaminated sawdust	**Vegetable oil**
Brake fluid	Oily wipes and sorbents	Tallow and animal greases
Compressor oil	Used oil spill debris	Vehicle antifreeze coolant
Refrigerant oil		Fuel tank sludge
Cutting oil		Solvents and oils used as solvent
Quenching oil		Parts washer sludge
Oil-water separator skim		Floor drain sludge
Non-PCB transformer oil		PCB hazardous waste oil
Petroleum-based grease		Mixtures of oil and other wastes

Please note that the biodegradable BioBlend bio-lube technologies use biologically-based vegetable base oils and/or synthetic ester base oils. They are not derived from conventional petroleum or synthetic oils and as such, and even after use, are **NOT** classified by the MPCA as ***'used oils'*** and thus are **EXEMPT** from the reporting requirements as outlined and decreed by the MPCA *(subject to the **'Used Oil Assumptions & Testing Requirements'** as addressed below).*

- ✓ This offers the users of the biodegradable BioBlend bio-lube technologies a signifcant operational advantage since any inadvertent oil spills do **NOT** have to be reported to the MPCA *(again, subject to the 'Used Oil Assumptions & Testing Requirements as addressed below),* even if they exceed 5 gallons.
- ✓ The continued use of conventional petroleum and/or synthetic lubricant technologies, which when used **ARE** classified as ***'used oil'***, have to be reported to the MPCA if a reasonable estimate of the spill amount exceeds 5 gallons.

Businesses with hard-working equipment, especially equipment operating outdoors in environmentally sensitive areas, benefit by using biodegradable BioBlend bio-lube technologies because the severe service operating environment makes their equipment prime candidates for oil spills. For example, consider how the following business types would benefit by eliminating the need to report inadvertent or accidental oil spills:

- ✓ Mining Equipment & Operations
- ✓ Refuse Haulers
- ✓ Construction Equipment & Operations
- ✓ Logging & Timber Related Operations
- ✓ Municipal Equipment & Operations (city / county / state)
- ✓ Agri-business Equipment & Operations

Used Oil Assumptions & Testing Requirements

Any lubricant used in mechanical equipment has the potential to pick up contaminants, be they external environmental contaminants, or contaminants and heavy metals from the metal surfaces of the equipment itself. The MPCA concerns itself with any used fluid that may contain ***'heavy metals'*** since heavy metal contamination beyond allowable limits would result in the fluid containing those heavy metals to be reported as a hazardous waste. In mechanical systems protected by lubricants there is the potential for the accumulation of some heavy metal contamination. The good news is that most conventional mechanical componentry does NOT contain the heavy metals of greatest concern by the MPCA.

In the referenced MPCA document used oil is considered *'off-specification'* until it is tested and shown to meet the levels in Table 2. Used oil that meets these requirements is considered *'on-specification'*. You need only test most used oil once per site, unless your business operations change. In the event of an inadvertent lubricant/oil spill you only have to report the spill if using a biodegradable BioBlend bio-lube technology if you have reason to believe that the oil involved in the spill contains levels of heavy metals that exceed the threshold values established in Table 2:

Table 2: Used Oil Specifications

(Link: http://www.pca.state.mn.us/index.php/view-document.html?gid=4010)

Criterion	***Specification***
Flash point	100° Fahrenheit or higher
Arsenic	5 ppm or less
Cadmium	2 ppm or less
Chromium	10 ppm or less
Lead	100 ppm or less
PCBs	2 ppm or less
Halogens	1000 ppm/4000 ppm* maximum

*Used oil containing more than 1000 ppm total halogens is a fully regulated hazardous waste unless you can document that it does not contain more than 100 ppm of any individual halogen, in which case you may consider it on-specification used oil if it contains less than 4000 ppm total halogens.

Here's the good news for the users of biodegradable BioBlend bio-lube technologies … the only substances you'd typically need to concern yourself with are chromium and lead. And, unless you have unique bearings and or exotic surface finishes within your equipment, your chances of seeing a used biodegradable BioBlend bio-lube technology containing >10 ppm Cr *(chromium)* or >100 ppm PB *(lead)* are negligible at best since these type heavy metals are not present in signifcant quantities in most modern equipment, and if they are, used oil analysis can satisfy you of levels contained within the oil.

So, as long as there is not reasonable potential to believe that the BioBlend oil you inadvertently spilled contains >10 ppm Cr or >100 ppm Pb … you do **NOT** have to report the spill to the MPCA. The chances that a spilled BioBlend fluid would contain sufficient levels of regulated heavy metal contamination are remote at best.

Many questions about oil spills seem to be centered around hydraulic fluids *(the potential for an oil spill is generally considered high due to exposed hydraulic hoses, and the severe operating conditions that hydraulic systems are subjected to)*. Consider this in summary:

- ✓ BioFlo Biodegradable Hydraulic Fluid product technologies *(i.e. the BioFlo AW-series / BioFlo AWS-series / BioFlo HEES-series)* use canola oil which is a ***'vegetable oil'.*** Thus the BioBlend BioFlo Biodegradable Hydraulic Fluids are **NOT** classified as ***'used oil'*** … and thus are **EXEMPT** from MPCA reporting requirements if spilled in the environment.

- ✓ Conventional petroleum/synthetic hydraulic fluid are classified as ***'used oils'*** by the MPCA, thus any related oil spills in excess of 5 gallons require reporting as per MPCA reporting requirements.

Oil Spill Reporting

The biodegradable, biologically-based, bio-lubricant technologies manufactured and marketed by BioBlend are created with vegetable base oils and/or synthetic ester base oils. As such these biodegradable BioBlend bio-lube technologies, even after use, are **NOT** classified by the MPCA as ***'used oils'*** and thus are exempt from the reporting requirements as outlined and decreed by the MPCA

While the MPCA does not require biologically based fluids to be managed or handled as used oils or hazardous waste …. it allows for them to be treated as such if there is a reasonable belief that the spilled oil waste might contain heavy metals. If you believe or know that your spilled oil contains heavy metals exceeding the MPCA allowable levels – you are allowed to report the spill directly to the MPCA Duty Officer by calling (651) 649-5451 or (800) 422-0798. The duty officer will record all pertinent information and then make the appropriate notifications to the state agencies.

Spill Clean Up

It is the inadvertent oil spills that concern most businesses. Regardless, environmental oil spills of any size/magnitude should be avoided whenever possible, and cleaned-up in as quick and reasonable a fashion as possible … even if using one of the biodegradable BioBlend technologies.

Believe it or not even spills of fluids that are clearly biodegradable may still need to be reported if the party involved believes the impact of said spill could have an environmental impact.

For instance: The state of Minnesota is a big dairy state. If a truck carrying 5,000 gallons of heavy cream *(biodegradable and heavy-metal free)* were to tip over and spill during winter the cream could freeze solid in short order. During the spring thaw this heavy cream could flow into a nearby river or stream where its presence lowers the biological oxygen demand needed for microorganisms to survive in that water. Thus, it should be reported. On the other hand, if the same spill were to occur in the summer and the heavy cream leeched into the soil in short order, the need to report the spill is different as it would not create a negative biological impact on the environment – other than flies and bugs may congregate at the spill site to feast.

The referenced publication states: *'All used oil spills must be cleaned up immediately. Manage contaminated cleanup materials as a used oil-related waste'.* Since the biodegradable BioBlend are based on vegetable oil - not petroleum oil - and as such are NOT classified as *'used oil'* … the regulations pertaining to a user responding to used oil spills as defined by the regulation do not apply. However, in the spirit of maintaining as pristine an environment as possible, a clean-up is still recommended. Absorption potential and biological oxygen demand ramifications should always be considered when an oil spill occurs.

BioBlend Technologies: Biodegradability / Minimal Toxicity / Non-Bioaccumulation

The biodegradable BioBlend technologies do NOT contain the toxic wastes the MPCA is concerned about … and in fact many of the biodegradable BioBlend bio-lube technologies meet current EPA definitions to be classified as *Environmentally Acceptable Lubricants (EALs)* and thus are suitable for use where the potential exists for oil-to-water contact as per the *EPA's 2013 Vessel General Permit (VGP)* regulation. If the biodegradable BioBlend bio-lube technologies are safe for oil-to-water contact … they are safe for oil-to-soil contact as has been demonstrated when the BioBlend technologies have been submitted for testing to determine if they meet current EPA definitions to be classified as EALs.

Consider the questions raised if a piece of equipment with a 40 gallon reservoir of biodegradable BioBlend hydraulic fluid leaks, and let's say half the volume ends up on the ground and/or enters the sewer system.

Q. Do you have to report the biodegradable BioBlend bio-lube product technology spill?

A. No, you do not. It is not classified as 'used oil".

Q. Should you report the biodegradable BioBlend bio-lube product technology spill?

A. Only if you suspect heavy metal contamination to have occurred from the hydraulic system. In the absence of having used lead-based seals and operating the hydraulic fluid in a chromium-plated hydraulic system – the likelihood of heavy metal contamination is minimal at best.

Q. What happens to the biodegradable BioBlend bio-lube spilled oil?

A. Biodegradation of hydraulic fluid does **NOT** occur when the fluid resides within the hydraulic system … it takes soil and/or water microbes, heat/UV radiation and water to catalyze the oil biodegradation process. So, the oil does not start biodegrading until it enters the environment … and only if these conditions exist. The entire BioFlo series of hydraulic fluids are readily Biodegradable, Minimally Toxic, and Not Bioaccumulative per current EPA definitions, and thus qualify to be classified as Environmentally Acceptable Lubricants *(EALs)* as the EPA's 2013 Vessel General Permit *(VGP).* Here's what that means:

- ✓ ***Readily Biodegradable:*** The BioFlo hydraulic fluid technologies are >60% biodegraded in 28 days per OECD testing protocols as recognized by the EPA and thus are EALs as per the EPA's 2013 VGP *(i.e. safe for discharge into marine environments … both fresh and salt water)*. In the presence of water and microbial activity this means >60% of the fluid will be biodegraded and go back into the environment in less than 28 days. Our testing has suggested this will occur in ~10 days. Conversely,

petroleum hydraulic fluids are only inherently biodegradable, typically <20% biodegraded in 28 days under the same conditions, and thus are considered 'persistent' in the environment.

- ✓ ***Minimally Toxic:*** The BioFlo hydraulic fluids are minimally toxic to the environment while they biodegrade as per OECD testing protocols as recognized by the EPA and thus are EALs as per the EPA's 2013 VGP *(i.e. safe for discharge into marine environments … both fresh and salt water).* Both the base oils and additive systems used in the BioFlo series hydraulic fluids are minimally toxic to water and soil microorganisms … which means they aren't toxic to - nor will they kill - essential water and soil microbes … which also means they have a negligible impact on higher life forms up the food chain to and including; fish, land-dwelling wildlife and people/ humans. Conversely the petroleum base oils and many of the additives found in conventional petroleum and synthetic hydraulic fluids are in fact toxic to soil and water micro-organisms and thus can continue to be toxic up the food chain to and including; fish, land-dwelling wildlife and people/ humans.

- ✓ ***Not Bioaccumulative:*** The BioFlo hydraulic fluids are not bioaccumulative to water and soil microorganisms common to the environment while they biodegrade as per calculations sanctioned and recognized by the EPA, and thus are EALs as per the EPA's 2013 VGP *(i.e. safe for discharge into marine environments … both fresh and salt water).* This means the BioFlo hydraulic fluid technologies will not accumulate in the tissues of micro-organisms and higher life forms while the products reside in the environment and biodegrade. Conversely the petroleum base oils and many of the additives found in conventional petroleum and synthetic hydraulic fluids are 'accumulative' which means they collect and build-up in the tissues of soil and water micro-organisms and thus will continue to accumulate in the tissues of species up the food chain including; fish, land-dwelling wildlife and people/ humans.

Q. What is the breakdown period of BioBlend hydraulic oil vs. petroleum based hydraulic oil if spilled and left unattended?

A. As described above the big differentiator is how fast the BioFlo Biodegradable Hydraulic Fluid product technologies will biodegrade in an environment conducive to biodegradation *(soil and/or water microbes, UV radiation and/or sunlight, heat, water).*

- ✓ ***BioFlo Biodegradable Hydraulic Fluids*:** Biodegrade >60% in 28 days per EPA-recognized OECD testing.
- ✓ ***Conventional Petroleum/Synthetic Hydraulic Fluids:*** Typically biodegrade <20% in 28 days per EPA-recognized OECD testing.

Conclusions

1. By the federal EPA's definition, the biodegradable BioBlend bio-lube technologies are **NOT** classified as ***'used oil'***, and thus are **EXEMPT** from the EPA's ***'used oil'*** spill reporting requirements.
2. The State of Minnesota does **NOT** classify the biodegradable BioBlend bio-lube technologies as ***'used oil'*** and as such they are **EXEMPT** from the MPCA reporting requirements in the event they are inadvertently spilled in the environment.
3. States can operate via the federal reporting requirements for ***'used oil'*** spills, or have their own state standard that may differ from federal classifications and reporting requirements. As such, users of biodegradable BioBlend bio-lube technologies are encouraged to determine if the states they operate their equipment in classify lubricants derived and built on biologically derived vegetable and synthetic base oils as ***'used oils'***. If they don't classify them as ***'used oil'*** there is a strong likelihood they will be **EXEMPT** from that states requirements for reporting if involved in an oil spill.
4. Users of biodegradable BioBlend bio-lube technologies should take into consideration whether or not the equipment they own and operate contains heavy metals. Although it's a fact that wear of equipment

surfaces occurs over time – the reality is it's not likely that heavy metal contamination of the used BioBlend bio-lubes would warrant a need for reporting if spilled in the environment.

5. The time, energy and costs associated with inadvertent lubricant spills and affiliated reporting and clean-up requirements, especially for equipment using hydraulics, is dramatically reduced when biodegradable BioBlend bio-lube technologies are used in place of conventional petroleum and/or synthetic fluids.

Oil spills will occur, typically for reasons beyond your control. Use biodegradable BioBlend bio-lube technologies … it's like purchasing risk mitigation insurance for your equipment. They won't biodegrade in your equipment, they'll offer performance on par with conventional petroleum products, and they'll save you substantial time, energy and monies in the event an inadvertent oil spill does occur.

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BioBlend Renewable Resources, LLC made their lubricant debut in the field in 2001. Since then, we've continued our bio-lubes innovation quest expanding our product line to include not only the most advanced biobased lubricant technologies available, but also food grade and synthetic lubricants. BioBlend's goal is to provide environmentally responsible products and solutions to a wide range of industries. Our customers come to us from every corner of the earth and in every industry: drilling, mining, construction, agriculture, marine, food processing, government, and many more. The BioBlend team has a wealth of experience in lubricants, manufacturing, and distribution. The company also has the venture capital backing of Archer Daniels Midland (NYSE: ADM) and Quest Technology Ventures.

- ✓ ***Made in the United States of America***
- ✓ ***Renewable***
- ✓ ***Readily Biodegradable***
- ✓ ***Minimally Toxic***
- ✓ ***Sustainable***
- ✓ ***Performance Driven***
- ✓ ***Cost Competitive***

Peter G. Haines
VP - Business Development
BioBlend Renewable Resources, LLC
2250 Arthur Avenue - Elk Grove Village, IL 60007

Email: peter.haines@bioblend.com
Mobile: 218.393.5699
Skype ID: peter.haines.22
Web: www.bioblend.com

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EPA - 40 CFR Part 261 – Identification and Listing of Hazardous Waste:
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