Used Oil Management Pollution Prevention Alternatives

COMMONLY OBSERVED PRACTICES

Most vehicle maintenance facilities are used oil generators. A majority of the vehicle maintenance facilities visited as part of the IPPI pilot project provided their used oil to a used oil marketer/recycler.

Used oil that has not been mixed with hazardous waste is exempt from hazardous waste regulation provided that it is recycled or burned for energy recovery. Appendix I contains information summarizing management requirements for generators of used oil. In general, used oil generators are responsible for ensuring that all used oil containers (including drums, tanks and any portable containers) are in good condition, not leaking and clearly labeled "USED OIL." Fill pipes for used oil tanks must also be labeled "USED OIL." Any used oil spills must be cleaned up as soon as possible and any oily waste generated from the cleanup must be properly characterized and disposed. Used oil containers (including portable containers) should also be kept sealed except during transfer operations. There are no accumulation time limits or maximum on-site storage amounts for used oil.

POLLUTION PREVENTION OPTIONS

The following three recycling options exist for generators of used oil:

- Used oil may be provided to a used oil marketer who then provides it to an oil burner;
- Used oil may be provided directly to a burner, in which case the used oil generator is subject to used oil marketer requirements; or
- Used oil may be burned on site in an oil-fired furnace.

Of the above alternatives, the best (and least complicated) used oil management options are: 1) providing used oil to a used oil "marketer", or 2) purchasing a used oil furnace and burning used oil on site for energy recovery.

USED OIL MARKETER/RECYCLER

A used oil marketer collects used oil and provides oil, as fuel, directly to a burner. Marketers are required to test the oil prior to burning to ensure that the oil meets EPA specifications and obtain an EPA identification number as a used oil marketer. Used oil marketers generally offer transportation services. Depending on the marketer and the quantity of used oil generated, the generator may be paid a small amount of money for the used oil or the generator may have to pay the marketer.

Since the generator is liable for contamination resulting from mismanaged used oil, marketers should be chosen carefully to ensure that the oil is managed properly. When providing used oil to a marketer, receipts documenting the used oil marketer's EPA identification number, the date on which used oil was picked up and the amount of used oil picked up should be kept on file for a minimum of five years. A list of used oil marketers is provided in Appendix I.

USED OIL FURNACES

Another pollution prevention alternative for used oil is to use it on site for fueling an oil-fired furnace. Vehicle maintenance facilities may burn used oil on site for energy recovery provided the following conditions are met:

1. The used oil has not been mixed with a hazardous waste.
2. The used oil burned at the facility is generated on site or collected from "do-it-yourselfers." Farmers generating less than 25 gallons of used oil per month and households are considered "do-it-yourselfers;"
3. The used oil furnace is designed to have a maximum BTU capacity of not more than 500,000 BTUs/hr; and
4. The used oil furnace is vented to the outside.

Pollution Prevention Cost/Benefits

Burning used oil on site for energy recovery offers the following pollution prevention/cost benefit advantages:

- It reduces or eliminates the environmental liabilities associated with off-site transportation.
- Facilities that burn used oil on site for energy recovery have better control over how their used oil is managed.
- Significant savings in shop heating costs can be realized during the winter months.

Sizing of the Used Oil Furnace

The amount of used oil generated at a facility during the heating season typically limits the size of the used oil furnace that can be operated. In general, a furnace with a heating output capacity ranging from 100,000 to 150,000 BTUs/hour is recommended for facilities that generate between 800 and 1,300 gallons of used oil during the heating season (roughly November through March). Facilities that generate between 1,300 and 2,500 gallons of used oil per heating season produce enough fuel for a furnace with a capacity of 188,000 to 225,000 BTUs/hour. Furnaces with a BTU/hour output ranging from 275,000 to 400,000 are recommended for facilities generating over 3,000 gallons of used oil per heating season. Used oil generated during the off season could be provided to a used oil marketer or stored in additional aboveground tanks to fuel a larger capacity furnace during the winter months.

Depending on heating output capacity, used oil furnaces cost approximately $3,000 to $8,000. Installation costs vary from approximately $800 to $2,000. Additional equipment such as a 250 gallon tank and stand are also available for use with the used oil furnace at a cost of approximately $1,500.

The size of used oil furnace needed to heat a shop is difficult to determine since it depends on a number of factors including the shop's actual size and configuration, placement of the furnace within the shop area, ceiling height, building insulation, and the amount of heat lost through open doors. The output capacity of a used oil furnace needed to heat a shop may be estimated by performing the calculations presented in Figure 5-1.

Figure 5-1
Used Oil Furnace Output Capacity Estimate Worksheet

ITEM	VARIABLE	EXAMPLE	YOUR FACILITY
A	Area of shop (ft^2)	3,500	
B	Average ceiling height (ft)	14	
C	Volume of area to be heated (ft3) = A x B	49,000	
D	Heating capacity factor (BTUs/hr)[a]	3	
E	Furnace output capacity required (BTUs/hr) = C x D	147,000	

[a] Heating capacity factor (C) is a function of the outside temperature (T^o) on the coldest day
If T^o = 30°F, then C = 2.5 BTUs/hr If T^o = 20°F, then C = 3.0 BTUs/hr
If T^o = 10°F, then C = 3.5 BTUs/hr If T^o = 0°F, then C = 4.0 BTUs/hr

A vehicle maintenance facility should consider its oil storage capacity when evaluating the possibility of purchasing and fueling a used oil furnace. Should the total oil storage capacity exceed 1,320 gallons or if an aboveground tank with a capacity greater than 660 gallons be used (because of fueling requirements for the used oil furnace or any other petroleum product storage), the facility would be required to prepare and implement a Spill Control and Countermeasure (SPCC) plan. SPCC plans are designed to establish procedures, methods and equipment to prevent an oil release from occurring and mitigate any environmental impacts should a release occur. "Oil," as defined under federal SPCC regulations, includes any kind of oil product such as used oil, diesel, gasoline, petroleum solvent, vegetable oil and motor oil.

Cost/Benefit Analysis Estimate

Table 5-1 presents an example cost/benefit analysis estimate prepared for heating a vehicle maintenance shop with a used oil furnace. As shown, a total cost of $6,600 was estimated for the purchase of a used oil furnace with a 150,000 BTU/hour output, a 250-gallon used oil tank and stand system, chimney pipe and equipment installation. Actual equipment costs and the payback period will vary depending on the type of unit installed, the actual accessory equipment needed and installation requirements of the facility.

Assuming the facility generates 300 gallons of used oil each month and the furnace provides enough heat to save the facility approximately $1,500 in winter heating costs, the used oil furnace equipment will pay for itself within approximately 4.5 years.

Appendix I contains vendor information on used oil furnace systems. Prior to purchasing a system, it is recommended that vehicle maintenance facilities obtain a list of references from various vendors to assess the reliability of various used oil furnaces. Independently contacting other businesses

with used oil furnaces is also an excellent way to assess furnace reliability and anticipate potential problem areas during installation and operation. Insurance representatives, the local fire marshal and air permitting regulatory personnel should also be contacted prior to purchasing a used oil furnace to determine if they have any concerns or requirements on the installation of a system.

Table 5-1
Cost Comparison
Used Oil-Fired Furnace Cost Comparison

EST. HEATING COST SAVINGS	ACQUISITION AND OPERATING EXPENSES	USED OIL-FIRED FURNACE
	Used oil generated per month (gallons)	300
	Output capacity of furnace (BTUs/hr)	150,000
	Annual servicing costs per unit	$50
	Purchase of used oil furnace	$3,800
	Cost of installation	$1,300
	250 gallon tank and stand	$1,450
$300	Monthly heating cost savings (~Nov. - March)	
$1,500	Annual heating cost savings	
	Est. First Year Costs	$6,600
	Est. Subsequent Annual Operating Cost	$50
	Est. Annual Cost Savings	$1,450
	Est. Payback Period in Years	4.5

Note:
Capacity of furnace is based on used oil generation rates.
Cost comparison assumes the used oil furnace will provide enough heat during the winter months to offset the monthly heating cost used in the above estimate.